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**LONGITUDINAL ASSOCIATIONS BETWEEN ELEMENTARY AND MIDDLE
SCHOOL CONTEXTS AND STUDENT AGGRESSION IN
EARLY ADOLESCENCE**

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by

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ABSTRACT

High levels of aggressive behaviors in early adolescence are associated with a host of problematic short- and long-term outcomes, including school drop-out, substance use, mental health problems, and delinquency. Growing up in poverty increases youth risk for developing aggressive behavior problems. In part, this appears due to exposure to school contexts that are characterized by high levels of student poverty and low achievement, which can create socialization contexts that support aggression and impede the development of adaptive self-regulation skills. For example, when there are many aggressive children in the peer group, students are exposed to aggressive models and peer support for aggressive behaviors. In schools characterized by low levels of academic achievement, disorganized classes and demoralized teaching staff often fail to support student self-regulation skills, reducing the inhibitory control of student aggression. Several studies have documented associations between student aggression and school contexts characterized by high levels of student poverty or low levels of student academic achievement, but rarely have studies examined these contexts together using a developmental lens. In the current study, 365 children from low-income families (58% Caucasian, 17% Hispanic, 25% African American; 54% girls) were followed from preschool through seventh grade. Regression analyses predicted teacher and parent ratings of seventh-grade student aggression with school levels of poverty (percentage of students receiving free or reduced lunch) and academic achievement (percentage of students scoring below the basic proficiency level on state achievement testing) experienced during elementary school and middle school, controlling for student baseline aggression and family demographics. Results revealed significant effects of elementary- and middle-school school-level context on student aggression in seventh grade, with middle-school school achievement levels making unique contributions across school and home

settings (teacher and parent raters). Implications, limitations, and future directions of these findings are discussed.

Key Words: aggression, poverty, academic achievement, school context

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Chapter 1

Introduction

High levels of aggression in early adolescence are associated with a host of problematic outcomes, including school drop-out, substance use, mental health problems, and delinquency (Baker, 2013; López-Romero, Romero, & Andershed, 2015), incurring substantial cost to society (Welsh et al., 2008). Among the multiple factors contributing to the development of aggression, low socioeconomic status (SES) has been studied extensively in the literature. The adversities associated with growing up in poverty can have negative effects on children's development and adjustment, often undermining family stability and effective parenting, and contributing to elevated rates of aggressive behavior problems in early childhood (e.g., Evans, Chen, Miller, & Seeman, 2012; Guerra, Huesmann, Tolan, Van Acker, & Eron, 1995). Subsequently, research suggests that the school context may play an important role, either reducing or amplifying risk for aggressive behavioral development. Children from low-income families who enter school at-risk due to elevated aggression may be particularly vulnerable to the negative impact of disadvantaged school contexts.

The Impact of Poverty on Early Child Development and Aggression

Growing up in poorly-resourced, economically-disadvantaged environments puts children at risk for compromised development in multiple domains (Evans et al., 2012; Jarjoura, Triplett, & Brinker, 2002). In fact, relative to their economically-advantaged peers, children growing up in poverty are more likely to experience problems in areas of social-emotional adjustment, school

achievement, cognitive outcomes, and physical health (Brooks-Gunn & Duncan, 1997), all of which have negative implications for adjustment later in life.

Previous research has attempted to elucidate the ways in which growing up in poverty undermines adaptive development. Studies have demonstrated that poor physical health status, lack of home-based cognitive stimulation, negative parental behavior, stressful life experiences, and lack of available resources associated with poverty each contribute to the negative and long-term effects of poverty on children's outcomes (Campbell & von Stauffenberg, 2008; Duncan, Brooks-Gunn, & Klebanov, 1994; Eamon, 2001; Guo, & Harris, 2000; Eccles, & Harold, 1996; McLoyd, 1990; McLoyd, 1998). Evans, Gonnella, Marcynyszyn, Gentile, and Salpekar (2005) suggested that the chaotic nature of growing up in poverty may deprive children of the predictable, sustained, positive interactions with their caregivers and their environment that are necessary for healthy development, thereby contributing to deficits in self-regulation and other areas of socioemotional functioning. Consistent with this finding, research has demonstrated that children raised in an environment of poverty often have difficulties in many areas of socioemotional functioning such as self-regulation and coping with chronic stressors (Evans & English, 2002; Evans & Kim, 2013; Eamon, 2001). Research has also consistently found that children who come from low-income families are more likely to lack the skills necessary for school readiness (e.g., Donovan, & Cross, 2002; Ramey & Ramey, 2004; Rimm-Kaufman, Pianta, & Cox, 2000; Ryan, Fauth, & Brooks-Gunn, 2006); in turn, lacking school readiness skills at school entry predicts low academic achievement levels later on (Duncan et al., 2007), especially when children are placed in poor-quality classrooms at school entry (Pianta, Belsky, Vandegrift, Houts, & Morrison, 2008).

Likely as a function of these multiple mechanisms of action, growing up in poverty is associated with elevated risk for aggressive behavior problems (Evans et al., 2012). In one study, children from families with low incomes were 2.6 times more likely to demonstrate a

developmental trajectory characterized by stable, high physical aggression than children from middle or higher income families (Tremblay et al., 2004). By school entry, over 20% of children growing up in poverty demonstrate clinically-significant rates of disruptive behavior problems – almost three times the rate of children growing up in more advantageous family circumstances (Kaiser, Hancock, Cai, Foster, & Hester, 2000).

The Impact of Disadvantaged School Contexts on Child Aggression

For many children from low income families, risk for aggressive development is amplified when they enter school, especially when they attend poor-quality schools with many other disadvantaged children (Rutter & Maughan, 2002). Research has shown that, relative to children from economically advantaged families, children from low-income families are more likely to enter elementary schools characterized by high levels of student poverty and low levels of student academic achievement (Currie & Thomas, 2000). In the United States, 40% of students from low-income families enter schools that are characterized by a high density of other children from low-income homes (i.e., schools in which 75% or more children qualify for free and reduced; Jordan, 2015). In contrast, only 6% of students from low-income families attend schools where fewer than 25% percent of their peers are also low-income. In other words, students from low-income families are over six times more likely to attend a school characterized by high versus low levels of student poverty (Jordan, 2015).

Not surprisingly, schools that serve student bodies composed predominantly of low-income children also tend to have lower test scores, reflecting the negative impact of socio-economic disadvantage on student achievement (Battistich, Solomon, Kim, Watson, & Schaps, 1995; Murnane et al., 2006; Willms 2010). These schools often have fewer financial resources than schools serving more advantaged students, with fewer funds and lower per-pupil

expenditures to foster academic gains (Heuer & Stullich, 2011). Hence, not only do schools serving many low-income children struggle with lower student school readiness at school entry, they also often provide lower teacher quality, less rigorous curriculum, and weaker instruction than other schools, reducing the pace of student academic learning over the course of time (Owens, Reardon, & Jencks, 2016; Willms, 2010).

Several theoretical frameworks provide a basis for formulating hypotheses concerning the ways in which disadvantaged school contexts may affect the development of aggression. These frameworks focus primarily on two alternative and complementary socialization processes. One involves peer contagion and refers to the social influences that emerge when disadvantaged children with elevated behavioral risks characterize the peer group and legitimize, model, and reinforce aggressive behavior (peer effects). The other involves the negative impact of disorganized learning environments and poor classroom management on the development of student self-regulatory skill development (teacher effects). Each of these processes are described further in the following sections.

Problematic Peer Effects in Schools Characterized by High Levels of Student Poverty

Several researchers have documented elevated levels of aggressive behavior problems in schools serving a high density of children from low-income families (e.g., Battistich, et al., 1995). For example, Stewart (2003) found that schools serving many low-SES families were characterized by elevated levels of student aggression, including student victimization by violence and threats. In a short-term longitudinal study, Thomas, Bierman, Thompson, Powers, and the Conduct Problems Prevention Research Group (2008) documented links between school-level indicators of student poverty and growth in student aggressive behavior during a school year.

Researchers have postulated that links between school-level student poverty and student aggression might emerge as a function of elevated exposure to peer aggression, through processes associated with peer contagion (Kellam et al., 1998; Thomas, Bierman, & CPPRG, 2006). Prior research has documented links between exposure to peer groups with many aggressive members and growth in student aggression. For example, Kellam et al. (1998) found that children, especially boys, placed in first grade classrooms that contained many other aggressive students had significantly higher odds of being highly aggressive themselves at the end of the year compared with similar children placed in first grade classrooms with fewer aggressive peers. They also found that mean levels of classroom aggression predicted increases in student aggressive behavior problems over time (Kellam et al., 1998). Similarly, using a longitudinal design, Barth, Dunlap, Dane, Lochman and Wells (2004) found that children in classroom environments characterized by higher levels of teacher-rated aggression over a two-year period become more aggressive over time. In addition, Thomas, Bierman, and the CPPRG (2006) found that the density of student aggression was elevated in classrooms serving a high proportion of economically-disadvantaged students, and in turn, classroom-level aggression promoted increases in student aggression in elementary school. In fact, children who were exposed to elevated classroom aggression over multiple years in elementary school (chronic exposure) gained the most in aggression levels, relative to children exposed for fewer years (Thomas, Bierman, & CPPRG, 2006).

Exposure to high rates of peer aggression may create socialization pressures that support (or at least do not discourage) the use of aggression in at least two ways: passive and active contagion. Passive contagion occurs when social norms support the legitimacy of aggression, making it more acceptable to a greater proportion of the school population (Henry et al., 2000; Tversky, 1977). Active contagion occurs when peers model aggressive behavior and reinforce it

by responding positively, sometimes termed deviancy training (Dishion, McCord, & Poulin, 1999; Dishion, Spracklen, Andrews, & Patterson, 1996; Dishion & Tipsord, 2011).

Social norms and beliefs about aggression

Social norms form in schools when many children subscribe to an idea or display similar behavior. Social norms about aggression in the classroom are affected by the density of aggressive peers (e.g., Chang, 2004; Henry et al., 2000; Thomas et al., 2008). When there are more aggressive children in a classroom, children tend to evaluate aggression as a more legitimate behavior and tend to be more accepting of students who display aggression. For example, a number of research studies have found that aggressive children are more accepted by peers in classrooms that contain more aggressive students (Boor-Klip, Segers, Hendrickx, & Cillessen, 2017; Jackson, Cappella, & Neal, 2015; Stormshak, Bierman, Bruschi, Dodge, & Coie, 1999). Other research (e.g., Gottfredson, 2017) has shown that changing the social norms and beliefs about a topic (e.g., aggression) through systematic intervention can reduce the prevalence of that behavior in a school setting. This indicates that the density of students who support a social norm can predict individual aggressive beliefs and actions.

Deviancy training in friendships and social affiliations formed by aggressive youth

When aggressive youth congregate together, they may also influence each other's aggressive behavior through the active process of deviancy training. Based on social learning theory, Patterson, Littman, and Bricker (1967) first demonstrated that peer responses to aggression can reinforce aggressive tactics, leading successful aggressors to increase their use of aggression. Following preschool children across the course of a year, Patterson et al. (1967)

found that those who were successful in using aggression to attain objects from others or discourage unwanted peer behavior were increasingly likely to act aggressively over time. Dishion and colleagues (1996) documented similar processes in young adolescent friendships. Relative to non-aggressive friendship pairs, friendship pairs with histories of conduct problems were more likely to engage in rule-breaking talk and were more likely to laugh in response to their friend's rule-breaking talk. This kind of peer modeling and reinforcement in friendship conversations predicted later increases in aggressive and antisocial behavior. More recently, a number of studies have found that aggressive children tend to congregate together in school settings, forming friendships with other aggressive children, and modeling and reinforcing each other's aggression so that their interactions predict later aggressive development and behavior (e.g., Hanish, Martin, Fabes, Leonard, & Herzog, 2005; Dishion & Tipsord, 2011; Powers, Bierman, & CPPRG, 2013). Thus, children who are exposed to school contexts containing many aggressive peers are more likely to face exposure to deviancy training and thereby develop more aggressive patterns of behavior themselves (Espelage, Holt, & Henkel, 2003).

Disorganized Learning Environments at Low-Achievement Schools May Undermine Self-Regulation

A second prominent conceptual framework for understanding the negative impact of schools attended by children from low-SES families focuses on the elevated disorganization, reduced teaching effectiveness, and low levels of student achievement that often characterize these schools (Lacour & Tissington, 2011). Schools with low levels of student achievement often struggle to attract and keep experienced, high-quality teachers and administrators (Cawelti, 2000; Stiefel, Berne, Iatarola, & Fruchter, 2000). Correspondingly, these schools are often characterized by administrative instability and disorganization, poor-quality teaching and student-teacher

relationships, and low levels of positive school climate (Cawelti, 2000). These factors may undermine student learning engagement and motivation and reduce support for the development of self-regulatory skills that would divert children from amplified aggression development. Interestingly, characteristics like strong instructional leaders, committed teachers, positive cultures, and safe and disciplined environments are consistently found in high-performing schools in high-poverty areas (Cawelti, 2000).

Administrative instability and disorganization

Schools serving many low-income students are often poorly-resourced and face challenges attracting and maintaining teachers, resulting in an underqualified, unstable, and demoralized teaching staff because more qualified teachers usually take higher-paying jobs at more economically advantaged schools (e.g., Clotfelter, Glennie, Ladd, & Vigdor, 2008; Ingersoll, 2004). Schools with the lowest-achieving students are more likely to have high rates of teacher turnover, with current research pointing to selective sorting being the reason that lower teaching quality characterizes schools with low student achievement levels. For example, the more qualified a teacher is, the more likely that teacher is to leave a school that has low-achieving students in favor of a school with high-achieving students (Boyd, Lankford, Loeb, & Wyckoff, 2005). Additionally, correlations in academic achievement between cohorts of students are higher in schools with lower rates of teacher turnover compared to schools with higher rates of teacher turnover, indicating that lower turnover predicts student academic stability (Rivkin, Hanushek, & Kain, 2005).

Poor-quality teaching and student-teacher relationships

It is widely documented that teacher quality is a robust predictor of children's academic achievement (e.g., Darling-Hammond, 2000; Rivkin et al., 2005; Rockoff, 2004), leading researchers to hypothesize that one reason a school may have low levels of academic achievement is poor-quality teaching, including both poor-quality instruction and ineffective classroom management strategies. High quality teachers are able to create environments in which students are positively engaged and positioned to succeed, and their influence may be amplified for low-income students (Rivken et al., 2005). For example, having a high-quality teacher has significantly more impact on student outcomes in high-poverty schools than in low-poverty schools (Sass, Hannaway, Xu, Figlio, & Feng, 2012). Classroom quality and individual development can intersect as well. High-quality student-teacher relationships predict socioemotional growth and decreases in aggressive behavior in elementary school (Burchinal et al., 2008; Mashburn et al., 2008; Pianta, La Paro, Payne, Cox, & Bradley, 2002). Teachers who establish a well-structured, caring classroom environment are more likely to have students who are academically and behaviorally engaged (Hamre et al., 2013; Thomas et al., 2008); in turn, more engaged students are more likely to attend school and have higher levels of academic achievement (Klem & Connell, 2004).

Conversely, teachers who struggle to manage classroom behavior may undermine student self-regulation and promote aggression by using coercive teacher control strategies – punitive discipline practices that increase student defiance rather than inhibit it (Hawkins, VonCleve, & Catalano, 1991; Hughes & Cavell, 1999). For example, a teacher who has a class with many disruptive children may institute policies of harsher discipline or use yelling and sarcasm to try to control the classroom. In turn, children may respond aggressively or in a challenging manner to the teacher's strategies. In these ways, teachers with poor management skills often produce

disorganized, unfriendly learning environments and conflictual relationships with students that both reduce learning engagement and increase behavioral dysregulation and aggression (Hughes & Cavell, 1999; Myers & Pianta, 2008; Stipek & Miles, 2008).

Teacher effectiveness and peer influences

Teacher effectiveness (e.g., the quality of instruction, teacher-student relationships, and positive classroom management) affects student behavior and hence affects peer norms and peer influence. High levels of teacher effectiveness foster student learning engagement and motivation, creating contexts in which the prevailing social norms support school liking and the inhibition of aggression (e.g., Battistich et al., 1995; Chang, 2004; Gottfredson, 2017). Whereas friendships among aggressive students reinforce aggressive behaviors (Powers et al., 2013), having high-achieving friends predicts increases in achievement over time (Epstein, 1983). Additionally, naturally-occurring peer groups also predict students' learning engagement such that the engagement levels of peer associates at the start of the school year predicts their own engagement levels at the end of the year, controlling for their initial engagement levels (Kindermann, 1993).

Relatedly, school connectedness is a term that describes a student's feeling of being part of a school as well as being cared for by the people at that school (e.g., McNeely, Nonnemaker, & Blum, 2002). Higher levels of school connectedness are associated with many positive outcomes such as achievement and commitment to school (Wilson, 2004), whereas increased school disorder (a lack of connectedness between students and between students and the school) is associated with elevated levels of bullying-related attitudes and experiences (Bradshaw et al., 2009). Additionally, Battistich et al. (1995) found that within schools, a positively-connected school community was significantly associated with a set of social and self-regulation skills that

decrease aggression, including improvements in conflict resolution skills and enjoyment of helping others learn.

Inadequate support for developing self-regulation and increased aggression

In schools characterized by low student achievement, each of these factors (e.g., administrative instability, poor-quality teaching and student-teacher relationships, and negative school climate) may contribute to poor student academic performance. These same factors may increase risk for aggressive behavioral development because of their negative impact on developing self-regulation skills and learning engagement.

Under optimal conditions, children develop a set of skills fostered by positive school contexts that support the inhibition and control of aggressive behavior. These include cooperation skills (e.g., helping, sharing, taking turns) that help children make friends and get along with others, as well as emotion management and behavioral regulation skills that allow them to inhibit impulsive and reactive aggression (Coolahan, Fantuzzo, Mendez, & McDermott, 2000; Denham & Burton, 2003; Ladd, Buhs, & Seid, 2000). The development of these prosocial and self-regulation skills occurs in parallel to positive learning engagement, and they are reflected in the capacity to participate cooperatively in classroom activities, and control attention and sustain task involvement (Ladd et al., 2000; McClelland, Acock, & Morrison, 2006). Likewise, the ability for a child to organize their behaviors to follow classroom rules and engage in learning tasks with persistence are both positively linked with achievement (McClelland, Acock, & Morrison, 2006).

In all of these examples, positive achievement- and engagement-oriented peer groups help promote skills that divert from aggression. It is possible that, despite the increased risk for elevated student aggression that occurs in schools serving many low-income students, the broader context of student academic engagement and achievement acts as a positive pull away from

aggression. Interestingly, prior studies have examined the effects of school poverty or school achievement levels on student outcomes but rarely have compared these two aspects of school context as possible cumulative or interactive influences on student aggression. A central goal of the present study was to examine the combined and interactive effects of these two aspects of school context on the development of aggressive behavior. While these contexts are important to consider, the timing of children's development also matters for aggression development.

Structural Changes between Elementary and Middle School

The transition from elementary to middle school can be a tough one for children, and many factors influence the success of that transition (Aikins, Bierman, & Parker, 2005). Normatively, rates of student school engagement decline as children make the transition into early adolescence and middle school (Marks, 2000), and variability among students in areas of behavioral and academic motivation and adjustment increase (Midgley, Anderman, & Hicks, 1995). In the self-contained classrooms that characterize elementary school, student aggression is affected by the aggression levels of students within classrooms and their selected friends, but teachers have considerable influence over student behavior through their classroom management strategies (Powers, Bierman, & CPPRG, 2013). However, as children transition from elementary school to middle school where students interact in multiple classroom settings with many teachers, students have more autonomy to select friends from a broader peer group, and teachers have less capacity to monitor and manage student behavior outside of the classroom and feel less efficacious doing so (Ryan, Kuusinen, & Bedoya-Skoog, 2015). When students establish stable, high-quality friendships in middle school (Aikins, Bierman, & Parker, 2005) and connect with peers who are academically focused (Hill & Tyson, 2009), they reap benefits in areas of school

adjustment and academic achievement. In addition, Klem and Connell (2004) found that middle school students reap more benefits from engaging teachers than do elementary school students.

Given these changes in the middle-school structure, it is possible that the characteristics of peers and the nature of school organization and teaching quality might have a particularly strong influence on student aggression in middle school relative to elementary school. For this reason, characteristics of the school context including school-level student poverty and school-level achievement levels may influence student aggression in middle school in ways that extend or moderate the influence of these school context factors in elementary school.

The Changing Nature of Aggression in Middle School

The nature of aggression changes over time as children develop and move from elementary school into middle school, making it possible that school context effects on student aggression also differ in elementary versus middle school (Yoon, Barton, & Taiariol, 2004), and previous research has shown that school level factors (e.g., academic performance) have greater impact on aggressive behavior development in middle school than in elementary school (Herrenkohl et al., 2000).

In addition, the types of aggression exhibited by children expand as they move through middle childhood and into early adolescence, including more planned, covert, and socially sophisticated forms of aggression and antisocial activity (e.g., Crick & Bigbee, 1998; Hawley, 2003). In adolescence, deviancy training is evident within sub-domains of aggressive behavior, such that having relationally aggressive or instrumentally aggressive friends makes a child more relationally aggressive and instrumentally aggressive, respectively (Sijtsema et al., 2010). Furthermore, Bradshaw, Sawyer, and O'Brennan (2009) found that a high concentration of student poverty in middle school was associated with increased risk for involvement in bullying,

similar to findings in elementary school regarding the congregation of aggressive children in schools that serve primarily low-income students.

However, given all of these findings, little research has been done examining school contexts of both poverty and academic achievement together and their impact on the development of aggression in children and emerging adolescents. In addition to elucidating the unique and combined influences of two types of school context, a goal of this study is to explore school context effects at two distinct developmental periods (elementary school, middle school) on low-income students' aggressive behavior in middle school.

The Heightened Vulnerability of Students Who Enter School with Elevated Aggressive Behaviors

Children from low-income families who enter school with poor self-regulations skills and elevated aggression may be particularly vulnerable to the negative effects of school contexts associated with elevated student poverty and low achievement (Rutter & Maughan, 2002). When children enter elementary school, they face increased responsibility and have higher demands placed on them, requiring and rewarding sustained behavioral inhibition, compliance with rules, and initiation and sustenance of positive interpersonal relationships, both with teachers and peers (Campbell & von Stauffenberg, 2008; Kellam, Rebok, Ialongo, & Mayer, 1994). The handling of this increase in responsibilities requires certain social-emotional competencies that allow children to adjust to school in a healthy manner. Children who enter school at a disadvantage due to inadequate resources and support for the development of social-emotional and self-regulation competencies may be particularly dependent upon the school context to facilitate these skills. For this reason, they may be more affected by inadequate school contexts that expose them to an aggressive peer group or poorly managed learning environments. Similarly, it is possible that

children with higher baseline aggression levels are especially affected by negative school contexts. Children who are aggressive in first grade are more likely than their less aggressive peers to be more aggressive in subsequent grades (Kellam et al., 1998). Given that children who enter school with elevated aggression levels probably lack the self-regulation skills necessary for productive classroom participation and engagement with teachers and peers, it seems plausible that they are susceptible to react in a more volatile way to the influences of high poverty or low achievement. Thus, a child's baseline aggression levels may moderate a school context's effects on that child, where higher initial aggression may result in a more detrimental influence from the negative school context.

The Present Study

School contexts have been shown to play an important role in the development of children's aggressive behaviors. Using a longitudinal sample followed from pre-kindergarten through seventh grade, the current study examined links between school contexts of poverty (percentage of students receiving free or reduced lunch) and achievement (percentage of students scoring below the basic level on achievement testing) experienced in elementary school and middle school and children's aggressive behaviors in early adolescence, controlling for their baseline aggression and family demographics. Additionally, children's baseline aggression was examined as a potential moderator of the impact of school-level poverty and achievement on later aggression.

The first aim of this study was to determine the extent to which elementary school context (school-level poverty and student achievement) accounted for variance in seventh-grade student aggression, controlling for baseline aggression and family demographics at school entry, and then to evaluate any additional variance accounted for by middle school context. It was

hypothesized that school context would predict children's aggressive behaviors in seventh grade, with significant variance accounted for by elementary and middle school experiences, and unique variance accounted for by school-level poverty and achievement. The second aim of this study was to determine whether child aggression levels at school entry moderated the influence of later school contexts on the course of aggressive behavioral development. It was hypothesized that children with higher levels of aggression at school entry would be differentially vulnerable to the effects of negative school contexts in elementary and middle school.

Chapter 2

Method

Participants

356 children participated in this study (17% Hispanic, 25% African American; 54% girls). Children were recruited in preschool ($M = 4.59$ years old, $SD = .32$, range = 3.87–5.82 at initial assessment) from 44 Head Start classrooms in three counties in Pennsylvania as part of the Head Start REDI (Research-based, developmentally informed) study. Half of the classrooms were located in a fairly densely populated county in southeast Pennsylvania; this included a larger urban community surrounded by smaller suburban communities. Small towns and more rural areas characterized the location of the other Head Start classrooms. Families were low-income, with a median annual income of \$18,000, and an average income-to-needs ratio of .88. About one-third (31%) of the parents had less than a high school education, 60% had graduated from high school or received a GED, 8% had completed a technical degree, and 2% completed a college degree.

The Head Start REDI project included the randomization of Head Start classrooms to a preschool intervention. This study begins in the kindergarten year, when all participants had completed intervention. Hence, all participants are included in the current study, with preschool intervention condition included as a covariate.

Measures

Children were recruited into the study in kindergarten and followed through seventh grade. The seventh-grade outcomes examined in this study included teacher and parent ratings of aggressive behavior, conduct problems, and school discipline problems. Measures of school context were collected from state databases. These measures are described below.

Child Behavior Outcomes in Grade 7

Teachers assessed aggressive-oppositional behaviors at school and parents assessed aggressive-oppositional behaviors at home using the seven-item Authority Acceptance scale from the *Teacher Observation of Child Adaptation-Revised (TOCA – R*; Werthamer-Larsson, Kellam, & Wheeler, 1991) which assessed overt aggression (e.g., “yells,” “fights,” “harms others”) and oppositional behaviors (e.g., “stubborn,” “breaks rules,” “ignores or refuses to obey adults”). Items were rated on a 6-point scale (1 = “never” to 6 = “always”) and averaged to create a total score for aggressive-oppositional behavior ($\alpha = .90$ for teachers, $\alpha = .79$ for parents).

Teachers rated conduct problems at school and parents rated conduct problems at home using the *Strengths and Difficulties Questionnaire* (Goodman, 1997). The 5-item conduct problems scale described behaviors symptomatic of conduct disorder (e.g., fights, lies, steals). Each item was rated on a 3-point scale (0 = “not true” to 2= “certainly true”), and ratings were summed to create a total score ($\alpha = .80$ for teachers, $\alpha = .71$ for parents).

In addition, parents provided ratings of their child’s discipline problems at school, rating three items on the *School Adjustment Scale* (Conduct Problems Prevention Research Group, 1997) that asked the parent to reflect on his/her child’s school disciplinary problems over the past

year. Each item was rated on a 5-point scale (1 = “never true” to 5 = “always true”), and ratings were averaged to create a total score ($\alpha = .85$).

School Context Ratings

Two aspects of school context were assessed. The percentage of students in the school receiving free or reduced-priced lunch was used to index school-level poverty (e.g., overall school levels of student economic disadvantage). This measure reflects the poverty of the school population and the surrounding area and is used commonly in this literature as a measure of economic disadvantage. Percentage of students in the school receiving free or reduced-price lunch was collected each year of student data collection (e.g., kindergarten, first, second, third, fifth, and seventh grade). For each study participant, the percent of students receiving free or reduced-price lunch in their elementary school each year between Kindergarten and 5th grade was averaged to create an estimate of school-level economic disadvantage in elementary school. Percentage of children in the school receiving free or reduced-price lunch in seventh grade was used to reflect middle school-level poverty.

School-level academic achievement levels were retrieved from state databases of standardized test records. Results were then used to compute an average of the percentage of children who were below the basic level of achievement (i.e., below state levels of proficiency) in the subjects of reading and math for each school. The percentage of students below the basic level in math and reading were averaged to create a measure of total achievement. Thus, the “below basic” measure is a variable that reflects the academic disadvantage of a school. Similar to school-level poverty, state records documenting the percentage of students in the school who were below the basic level of achievement each year when study children were in Kindergarten through fifth grade were collected. Achievement tests were not administered before grade 3; they

were only administered annually from grade 3 through grade 8. Hence, when a child was in kindergarten through second grade, the test scores of the concurrent third grade class in his or her school were used to assess school-level achievement. When a child was in third, fifth, and seventh grade, scores from their own respective classes were used to assess school-level achievement for each year. School-level achievement data gathered when children were in elementary school (kindergarten through grade 5) were averaged to create an estimate of school-level academic disadvantage experienced in elementary school.

It should be noted that, because the Head Start centers served entire counties and not any particular school districts, the children in this study were widely dispersed across schools and classrooms after leaving Head Start. By 1st grade, the 356 children were in over 200 first-grade classrooms in 82 elementary schools in 33 school districts. In most cases, children were the only study participant in their classrooms (70% in 1st grade, 72% in 2nd grade, 73% in 3rd grade, 78% in 5th grade). In the entire sample, only two children had the exact same classrooms and teachers across their elementary school years. Elementary schools in each school district merged into larger middle schools. Even so, half of the study children (49%) remained the only study participant in their middle school. Only a few middle schools (4 schools) contained as many as 10 or more study participants. Due to this sample dispersion, intraclass correlations (ICCs) were all low for dependent variables (ICCs all < .10). For these reasons, the school contexts experienced by individual students were measured as student-level variables, rather than treated as nesting variables in a hierarchical model.

Plan of Analyses

The analyses for this study were conducted in three phases: first, descriptive analyses were conducted to explore the characteristics of schools and the association between school

context variables and other child variables. Then, stepwise linear regressions were conducted to understand the association between elementary school (K-5) and middle school (grade 7) contexts and child aggression outcomes in seventh grade. Finally, interactions were calculated to determine if the effects of school context on seventh grade aggression were moderated by baseline aggression.

Covariates included demographic characteristics and study design features – child age, sex, race, and family income-to-needs ratio. Covariates also included intervention condition and baseline aggression. Teacher- and parent-rated aggressive-oppositional behaviors in the fall of preschool were used as baseline scores for aggression.

By the time this sample reached seventh grade, there was considerable attrition, with 62 of 356 (17%) children missing all seventh-grade data. Participants who had all sources (parent and teacher ratings) of data missing in seventh grade were more likely to be from the treatment condition rather than the control condition, $t(351) = 2.72, p < .01$. Multiple imputation was used to account for missing data. Data was imputed 40 times using SAS statistical software (SAS, version 9.3). Each new data set was analyzed separately, and results from each of these analyses were pooled to robustly approximate each estimate. In addition, three children were excluded from analyses because they were homeschooled in grade 7.

Chapter 3

Results

Descriptive Analyses

Table 1 presents descriptive statistics for the study variables. Measure raw scores are presented in the table, but standardized scores ($M = 0$, $SD = 1$) were used in all analyses. Doing this establishes a common scale for the metrics across measures so that coefficients represent the difference in standard deviations between conditions of variables (e.g., a coefficient of .5 represents half of a standard deviation).

Simple correlations among study variables are presented in Table 2. Correlations among student experiences with school-level poverty and school-level achievement are shown in the top rows of the table. Similar to what Barth et al. (2004) noted in their study, the levels of school poverty and levels of school achievement experienced by students were significantly correlated, $r = .73$ for experiences in elementary school, and $r = .78$ for experiences in middle school. Student experiences were also correlated across development, with levels of school poverty experienced in elementary and middle school correlated $r = .67$, and levels of school achievement experienced in elementary and middle school correlated $r = .67$. Correlations among teacher and parent ratings of aggressive behavior problems are shown in the lower rows of the table. Within rater, correlations across the different measures of aggressive-oppositional behaviors, conduct problems, and discipline problems were significantly correlated as expected ($r = .87$ for teachers; $r = .54$ to $.77$ for parents).

Table 1: Descriptive Statistics for Study Variables.

	<i>n</i>	Mean	<i>SD</i>	Min	Max
<u>Behavioral Outcomes (Grade 7)</u>					
<u>School Behavior</u>					
Aggression (T)	257	1.94	1.04	1.00	6.00
Conduct Problems (T)	257	1.67	2.19	0.00	10.00
School Discipline Problems (P)	290	1.78	0.95	1.00	5.00
<u>Home Behavior</u>					
Aggression (P)	293	2.24	0.85	1.00	5.29
Conduct Problems (P)	293	1.86	1.83	0.00	8.00
<u>School Context</u>					
<u>Grade K-5 School Context</u>					
% Free and Reduced Lunch	331	54.42	21.87	0.00	97.97
% Below Basic Achievement Level	329	12.20	6.93	0.75	34.83
<u>Grade 7 School Context</u>					
% Free and Reduced Lunch	264	53.91	19.52	0.00	96.57
% Below Basic Achievement Level	244	13.30	11.59	0.25	52.70
<u>Baseline Covariates (Preschool)</u>					
Family Income-to-Needs Ratio	335	0.88	0.61	0.01	5.45
Baseline Aggression (P)	355	2.90	0.98	1.00	6.00
Baseline Aggression (T)	355	1.92	0.88	1.00	5.00

Note: T = teacher-rated, P = parent-rated

Cross-setting (parent-teacher) correlations were considerably lower ($r = .33$ to $.40$), except for parent ratings of school discipline problems which were moderately correlated with teacher ratings of school aggression and conduct problems ($r = .55$ to $.56$). Teacher ratings of aggressive-oppositional behaviors and parent ratings of conduct problems and school discipline problems all showed significant, though small, correlations with school-level poverty and school-level achievement in middle school ($r = .18$ to $.24$), and teacher-rated conduct problems show a

small yet significant correlation with school-level achievement in middle school ($r = .15$). Parent ratings of conduct problems and school discipline problems also showed small yet significant correlations with school-level poverty and school-level achievement in elementary school ($r = .15$ to $.19$).

Table 2: Simple Correlations among Indices of School Context and 7th Grade Behavioral Outcomes.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Free/Reduced Lunch – K5	-								
2. Below Basic – K5	.73**	-							
3. Free/Reduced Lunch – 7th	.67**	.64**	-						
4. Below Basic – 7th	.52**	.67**	.78**	-					
5. Aggression (T)	.11	.16*	.20**	.24**	-				
6. Conduct Problems (T)	.08	.08	.12	.15*	.87**	-			
7. Aggression (P)	.07	-.00	.07	.09	.33**	.36**	-		
8. Conduct Problems (P)	.19**	.15*	.18**	.21**	.40**	.37**	.77**	-	
9. School Discipline (P)	.15*	.17**	.22**	.24**	.55**	.56**	.54**	.58**	-

Note: T = teacher-rated, P = parent-rated; * $p < .05$, ** $p < .01$

Regression Analyses

Using SPSS statistical software, stepwise regressions were calculated to predict each seventh-grade behavioral outcome. At step one, all control variables were entered (e.g., child age, sex, race, family income-to-needs ratio, baseline aggression score, intervention status). At step two, average levels of school poverty and school achievement levels experienced by the student in elementary school (kindergarten through fifth grade) were entered. At step three, levels of school poverty and school achievement levels experienced by the student in seventh grade were

entered. Though several predictors were highly correlated, regression statistics did not provide evidence of multicollinearity (all tolerance values $> .25$; all VIF values < 5).

The results of regressions focused on child behavior at school are presented in Table 3. In predicting teacher-rated aggressive-oppositional behavior in grade 7, the preschool covariates including baseline aggression accounted for a small but significant proportion of the variance, $R^2 = .07, p < .01$. Adding the elementary school context experienced by children at step two did not significantly contribute to the prediction of later aggression. However, adding the seventh-grade school context variables in step three explained an additional amount of variance, $R^2 = .05, p < .01$. Of the two school context variables included in the model, only the school-level percentage of children with below basic levels of achievement made a significant, unique contribution to the prediction of seventh grade teacher-rated aggressive-oppositional behavior, $\beta = .28, t(340) = 2.14, p < .05$. The model predicting teacher-rated conduct problems was similar, with a significant proportion of variance accounted for by baseline covariates, $R^2 = .06, p < .05$, non-significant contributions of elementary school context, and significant contributions when seventh-grade school context variables were added at step three, $R^2 = .03, p < .05$. For this model, only the percentage of children in the school who scored below the basic level of achievement in seventh grade made unique contributions to teacher-rated conduct problems at a trend level, $\beta = .23, t(340) = 1.69, p = .09$. Finally, for parent ratings of school discipline problems, baseline covariates accounted for a significant proportion of the variance, $R^2 = .05, p < .05$. However, in this model, unlike the previous two models, the elementary school context experienced by children in kindergarten through fifth grade accounted for a significant amount of additional variance in step two, $R^2 = .03, p < .01$, and achievement levels in kindergarten through fifth grade uniquely predicted parent-rated school discipline problems in seventh grade at a trend level, $\beta = .24, t(342) = 1.88, p = .06$. In step three, similar to the previous models, adding the seventh-grade school-level context variables explained additional significant variance in student discipline

problems in seventh grade, $R^2 = .05$, $p < .01$, with school-level rates of below basic achievement making unique contributions, $\beta = .23$, $t(340) = 2.01$, $p < .05$.

Table 3: Predicting School Problems from School Contexts.

	Model 1: Baseline		Model 2: With Elementary			Model 3: With 7th Grade		
	Covariates		School Context			School Context		
	F	R ²	ΔF	ΔR^2	β	ΔF	ΔR^2	β
Aggression (T)	3.58**	.07**	2.87	.02		9.03**	.05**	
Poverty K5					-.04			-.09
Achievement K5					.19			.02
Poverty 7					--			.02
Achievement 7					--			.28*
Conduct Problems (T)	3.14*	.06*	0.96	.01		5.04*	.03*	
Poverty K5					.04			.03
Achievement K5					.03			-.10
Poverty 7					--			-.03
Achievement 7					--			.23 [†]
School Discipline (P)	2.64*	.05*	6.44**	.03**		8.40**	.04**	
Poverty K5					.03			-.04
Achievement K5					.24 [†]			.07
Poverty 7					--			.06
Achievement 7					--			.23*

Note: Analyses control for child sex, age, race, family income-to-needs ratio, baseline aggression, and REDI intervention condition. "Achievement" reflects the percentage of children below the basic level of achievement; thus, a positive beta-weight indicates that lower achievement is associated with higher aggression.

T = teacher-rated, P = parent-rated; [†] $p < .10$, * $p < .05$, ** $p < .01$.

The results of regressions focused on child behavior at home are presented in Table 4. When predicting parent-rated aggressive-oppositional behavior, baseline covariates accounted for a significant proportion of the variance, $R^2 = .20$, $p < .001$. Adding the elementary school context variables (kindergarten through fifth grade) accounted for an additional significant amount of

variance in parent-rated aggression, $R^2 = .02, p < .05$. In this case, neither the percentage of elementary students receiving free and reduced lunch nor the achievements levels in the schools that children attended from kindergarten through fifth grade made unique contributions to their parent-rated aggressive-oppositional behavior in seventh grade. Adding seventh grade contexts into the model did not explain any additional significant variance. Finally, parent-rated conduct problems were significantly predicted by the baseline covariates, $R^2 = .13, p < .001$. Adding elementary school context variables to the prediction explained an additional significant proportion of variance, $R^2 = .05, p < .001$, with achievement levels making a unique prediction, $\beta = .24, t(342) = 2.09, p < .05$. In step three, adding seventh grade school contexts to this model explained additional variance, $R^2 = .03, p < .01$, with school levels of below basic achievement making unique contributions, $\beta = .24, t(340) = 2.19, p < .05$.

Table 4: Predicting Home Problems from School Contexts.

	Model 1: Baseline		Model 2: With			Model 3: With 7th Grade School		
	Covariates		Elementary School Context			Context		
	F	R ²	ΔF	ΔR^2	β	ΔF	ΔR^2	β
Aggression (P)	12.11***	.20***	4.27*	.02*		3.84 [†]	.02 [†]	
Poverty K5					.16			.15
Achievement K5					.02			-.08
Poverty 7					--			.00
Achievement 7					--			.19 [†]
Conduct Problems (P)	7.24***	.13***	11.35***	.05***		6.24**	.03**	
Poverty K5					.10			.08
Achievement K5					.24*			.10
Poverty 7					--			-.03
Achievement 7					--			.24*

Note: Analyses control for child sex, age, race, family income-to-needs ratio, baseline aggression, and REDI intervention condition. “Achievement” reflects the percentage of children below the basic level of achievement; thus, a positive beta-weight indicates that lower achievement is associated with higher aggression.

T = teacher-rated, P = parent-rated; [†] $p < .10$, * $p < .05$, ** $p < .01$.

Moderation by Baseline Aggression

To determine if children who entered school rated as more aggressive by their parent and teacher were particularly susceptible to the negative effects of adverse school contexts, a fourth step was added to each of the models above. This step included interactions between baseline aggression rated by the parents and teachers in preschool and measures of school context (both K-5 and grade 7). Contrary to expectations, there were no significant or substantive interaction effects that emerged between initial levels of aggression at school entry and school context variables on any of the seventh-grade outcomes (e.g., children's oppositional-aggression or conduct problems in school or home settings, or rates of school discipline problems in seventh grade).

Chapter 4

Discussion

These results document significant associations between the school contexts a child experiences and their aggressive behaviors in seventh grade, with a different pattern of association for aggressive behavior problems reported in the school (by teachers and parents) and reported at home (by parents). Across the three different measures of student problem behavior reported in the school in seventh grade (e.g., teacher ratings of aggressive-oppositional behaviors and conduct problems, parent ratings of school discipline problems), the seventh-grade school context added significant variance beyond baseline covariates and elementary school context, with school-level achievement contributing unique variance (significantly for aggressive-oppositional behavior and school discipline problems, and at a trend level for conduct problems). Seventh-grade school context explained 3%-5% of the variance in student aggression beyond baseline levels, a small but notable amount. Although school poverty levels were correlated with seventh grade behavior problems, they did not contribute significant, unique variance when school achievement levels were included simultaneously. When predicting the two measures of child problem behavior reported at home in seventh grade (e.g., parent ratings of aggressive-oppositional behaviors and conduct problems), the school context experienced in elementary school made a significant contribution, with school achievement levels making a unique contribution to conduct problems. Beyond the contributions of elementary school context, the school context experienced in seventh grade also accounted for significant variance in seventh grade conduct problems, with school-level achievement making a unique contribution.

Overall, these results support the hypothesis that school contexts are important to consider in models of the development of children's aggressive behavior problems. In addition,

the results suggest that the effects of school-level poverty and achievement are distinct. School-level poverty and achievement are often considered comparable indices of school adversity, and in this study of student experiences, they were fairly well-correlated ($r = .67$ in elementary school, $r = .78$ in middle school). Yet, they showed different associations with student aggression. This study does not illuminate the specific mechanisms underlying the effects observed, but several possibilities exist that could be explored in future research.

The Effects of School-Level Achievement on Seventh Grade School Aggression

Matriculating at a school with many low-achieving peers in seventh grade was associated with elevated aggression across home and school settings, regardless of school-level poverty levels, controlling for family demographics, baseline child aggression, and school contexts experienced in elementary school. There are several potential reasons why the school achievement context might have contributed unique variance to student aggression beyond school-level poverty. School-level poverty and school-level achievement are two related indices of school context influences. In studies of context effects on behavioral outcomes, poverty might function as a community-level risk, while achievement might function more as a school-level risk. Though related, low school achievement levels might have a greater impact than high student poverty because it may contain more information about school organization and functioning. Recently, Reardon (2017) found that school achievement matters in determining children's outcomes, especially in contexts of poverty. Although poverty is traditionally associated with a lack of resources and poor school performance, it does not solely determine opportunities for children to learn, and this is especially true in later schooling. There are many avenues by which a school can promote positive learning opportunities for students, buffering children from the reduced developmental resources and supports commonly associated with

poverty (Reardon, 2017). Given this, school achievement scores in middle school, in particular, might serve as an important index of the quality of the developmental supports provided by a school. Factors such as administrative stability, high-quality teaching and student-teacher relationships, and positive school climate often characterize high-achieving schools, and in turn, may promote regulatory capabilities that allow children to succeed academically and socially (Ladd et al., 2000; McClelland, Acock, & Morrison, 2006).

Researchers have speculated that low levels school achievement in schools serving many economically-disadvantaged students reflect the elevated disorganization and reduced teaching effectiveness that often characterize these schools (Lacour & Tissington, 2011), contributing to poor-quality student-teacher relationships and low levels of positive school climate (Cawelti, 2000). Teacher mobility is a common issue, as teachers and administrators frequently leave low-performing schools to find higher-paying and less stressful positions (Boyd et al., 2005; Stiefel et al., 2000). However, when schools serving many economically-disadvantaged students are able to address these factors successfully, with strong instructional leaders and committed teachers, they can create positive school cultures characterized by safe and disciplined environments that support student achievement (Cawelti, 2000).

These same factors that support student achievement may be associated with the adult supports and peer behaviors that foster student learning engagement and promote the development of self-regulatory skills that divert children from aggression development. That is, higher student achievement may reflect well-structured, caring classroom and school environments (Hamre et al., 2013; Klem & Connell, 2004; Thomas et al., 2008) and low levels of coercive teacher control or punitive discipline practices (Hawkins et al., 1991; Hughes & Cavell, 1999). In these contexts, where the prevailing social norms support school liking and the inhibition of aggression, peers model and reinforce self-regulated behavior, reducing opportunities for the kinds of negative peer contagion and peer deviancy training that are

associated with student aggression (e.g., Battistich et al., 1995; Kindermann, 1993; Powers et al., 2013).

Interestingly, school levels of academic achievement emerged as a significant predictor of teacher-rated aggression and conduct problems only in middle school; no associations emerged between school-level achievement in elementary school and teacher-rated aggression or conduct problems in seventh grade. The school-level achievement context may be particularly important in middle school because students must be more self-directed in their academic and social pursuits. While teachers are able to better control classrooms in elementary school (Powers, Bierman, & CPPRG, 2013), structural changes place more emphasis on student motivation for academic success and diversion from aggression in middle school, where teachers also feel less efficacious in managing student behavior (Ryan, Kuusinen, & Bedoya-Skoog, 2015). Thus, the characteristics of peers and the nature of school organization and teaching quality might have a particularly strong influence on student aggression exhibited in the school setting. Within a context of high achievement, students are able to establish high-quality friendships with academically-focused peers (Aikins, Bierman, & Parker, 2005; Hill & Tyson, 2009), and this may be able to divert students away from aggression in middle school, even when many students come from backgrounds of poverty. Perhaps expectations on students become more salient and influential in this time period. In other words, as academic success becomes more difficult and individualized (i.e., a student has to take more responsibility for his or her achievement), students who take their studies seriously and associate with other like-minded students are less likely to be engaged with students or situations which may foster aggression development.

Additionally, there was some evidence of associations between elementary school context and parent reports of child problems. Parent reports of seventh-grade discipline problems at school (at a trend level) and conduct problems displayed at home (at a statistically significant level) showed unique associations with school-level achievement in elementary school. Parent

ratings of seventh grade school discipline problems and home conduct problems were additionally associated with middle school achievement levels. It is possible that parent ratings of child aggressive behavior problems are a more sensitive index of school context effects on child development than teacher ratings. That is, parents observe their children over time, getting to know the behavior of their children well. In contrast, middle school teachers get to know the students for only one year, and often observe the students in only one class period.

No evidence for any baseline aggression by school context interaction effects emerged. Children who entered school rated as more aggressive were not differentially impacted by school context. Thus, school context effects appear to index important influences that may not necessarily depend on a child's aggression at school entry.

Strengths and Limitations

Perhaps the main limitation of this study is that our data did not allow for the examination of a direct mechanism of action. Several pathways through which poverty or achievement promotes aggression development were suggested, but our findings that context is important and achievement adds unique variance merely speculates on the potential mechanisms of action. One area of focus for future studies would be to assess teacher quality at each grade level to determine if there are any teacher quality by school context interaction effects. This would potentially elucidate the hypothesis that high-quality teachers can in fact buffer aggression development of high-risk students in poor-quality, low-income environments. Another potential mechanism of action that could be further explored is the development of children's self-regulation in low versus high achievement settings. For example, Frick and Morris (2004) and White, Jarrett, and Ollendick (2013) found that poor self-regulation was associated with reactive aggression. Other studies have found that deficits in self-regulation skills increase the likelihood of developing

aggressive behavior (Eisenberg, Spinrad, & Eggum, 2010; Frick & Morris, 2004, Robertson, Daffern, & Bucks, 2012) and that low levels of effortful control are associated with both proactive and reactive aggression (Xu, Farver, & Zhang, 2009). Future research could compare regulation as a possible mediator of the relationship between contexts of achievement and aggression development.

One potential strength and limitation of this study is that this was a Pennsylvania Head Start sample followed forward. Hence, the study documents the varied experiences with school context experienced by students at initial risk as a function of their family SES, and the association of those contexts with student aggression development. Children from low-income families are at elevated risk for academic underachievement and behavioral maladjustment, so understanding the contextual determinants of their development is important. However, the sample is not representative of all students, nor all schools; thus, the extent to which these findings might generalize to the broader population is unclear.

One strength of the study was the inclusion of both parent and teacher ratings. We found significant effects across raters indicating effects of context across settings; however, a limitation is that both parent and teacher raters may have been influenced by their own context when making the ratings. It would have been useful to have measures of student aggression that were more objective across the various community and school settings.

Conclusions and Future Directions

In the future, additional studies aimed at uncovering mechanisms of action underlying the observed effects in the current study would be helpful in determining how exactly school-level achievement and poverty are operating at a contextual level to influence children's aggressive behavior development. Specifically, it is imperative that studies examine more closely the

characteristics of schools that contribute to the higher levels of achievement attained by some schools serving many low-SES children as a way of increasing the quality of under-performing schools. This study suggests that this dimension of school context might be very important, especially in middle school, as a way of decreasing student aggression across school and home settings, as well as enhancing academic potential. This study also documents the impact of systemic factors at play in the progression of children's aggressive behaviors. While individual and familial factors certainly influence children's aggression, this study shows that system-level factors such as schools and school systems cannot be overlooked when allocating resources. By ignoring this level of influence, children attending low-quality schools may not be receiving the adequate supports they need for healthy development.

Though the effect sizes in this study were quite small (3-5% of the variance), by thinking about these effects as school-level influences on whole populations of students, the actual population-level impact of school-level achievement is quite large. These findings are indicators that school-level factors can have a significant impact on student outcomes. This study highlighted the importance of examining multiple levels of contextual influences and being sensitive to different developmental periods when considering the development and trajectories of children's aggressive behavior. It is important to consider how contextual factors, especially schoolwide achievement in middle school, contribute to or buffer against aggression development in high-risk children. As such, teachers, administrators, and school districts can better understand and address aggression and disparities in their schools, as well as plan and implement programs and interventions to best address problems.

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