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THE ROLE OF PARENTS' SUPPORT FOR LEARNING DURING THE FIRST FEW YEARS OF SCHOOL: BENEFITS FOR HIGH-RISK, AGGRESSIVE CHILDREN

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ABSTRACT

Children's school readiness lays the foundation for their later social and academic adjustment across the school years. Many students are not prepared to learn when they begin kindergarten, however, and contextual risk factors experienced prior to school entry, particularly low income, contribute to this disadvantage. Parents' support for learning has been identified as a mechanism through which risk influences children's readiness for school, but even among those experiencing risk, variation in parents' support for learning is associated with variation in children's academic, cognitive, and behavioral functioning.

The current study examined the role of parents' support for learning as a predictor of growth in children's academic skills, cognitive ability, learning engagement, social-emotional skills, and aggression between the entrance to kindergarten and the end of first grade. These longitudinal associations were explored within a uniquely high-risk sample of low-income ethnic-minority families whose children already showed high rates of aggression in kindergarten. Results highlighted the importance of parents' support for learning for their children's outcomes: Support for learning related to children's learning engagement at school entry and predicted growth in children's academic skills and cognitive ability, even when background family characteristics reflecting risk were included as covariates. Support for learning was not significantly associated with children's social-emotional skills or aggression in either kindergarten or first grade. Interventions that promote high quality and quantity of parents' support for learning may be a promising approach through which to foster the skills children need to succeed in and out of school.

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CHAPTER 1

INTRODUCTION

Children's ability to learn at the transition to school has far-reaching implications for their social and academic experiences across childhood and adolescence. As soon as they walk through the classroom door, children who are ready for school are prepared to meet the academic and social demands they face. They can learn new material more easily, follow instructions in spite of distractions, interact with teachers and peers competently, and persist with classwork even when frustrated. If, as others have noted (Duncan et al., 2007; Heckman, 2008), learning truly is a cumulative process and skill begets skill, readiness at the transition to kindergarten is critical because it sets the stage for more or less optimal developmental trajectories as children progress through school. This longitudinal study examines the role of parents' support for learning as a predictor of growth in children's academic skills, cognitive ability, learning engagement, social-emotional skills, and aggression between the entrance to kindergarten and the end of first grade. These associations are explored within a uniquely high-risk sample: Families living in urban poverty whose children already show high rates of aggression and disruptive behavior as they begin school.

A wide, diverse literature indicates that children's skills, behavior, and experiences in their families all make important contributions to their school readiness and outcomes over time. First, I review prior work on children's academic skills, cognitive ability, learning engagement, social-emotional skills, and aggression as predictors of their functioning at school. Next, I review the literature on specific family characteristics that shape children's school readiness and academic experiences across the early school years.

Components of Children's School Readiness

Academic skills. Children who already possess basic pre-academic skills when they start kindergarten are better able to master new concepts more quickly in school. Early literacy skills, such as phonemic awareness, vocabulary, and print knowledge, are the building blocks for more advanced reading and comprehension skills (Lonigan et al., 2000; NICHD ECCRN, 2005; Whitehurst & Lonigan, 1998). Similarly, basic numeracy skills are foundational to more complex arithmetic skills and problem-solving (Butterworth, 2005; Locuniak & Jordan, 2008; Passolunghi & Lanfranchi, 2012). Cross-domain associations between literacy and math also have been documented, and early skills have been shown to predict later achievement (Duncan et al., 2007; Hecht et al., 2001; La Paro & Pianta, 2000).

Cognitive ability. Another important element of school readiness is domain-general cognitive ability, which encompasses IQ, executive functioning, and attention. Children's IQ has been linked with a wide range of learning-related outcomes, including academic skills, grades, standardized achievement test scores, grade retention in the first few years of school, and completed years of education (Blair, 2001; Blair & Razza, 2007; Duckworth et al., in press; Neisser et al., 1996). Executive functioning includes the skills of working memory, inhibitory control, and set shifting, all of which are engaged to facilitate regulation of cognition and goal-directed behavior (Blair, 2002; Zelazo & Cunningham, 2007; Zelazo et al., 1997). Children use working memory to hold and manipulate information "online" in the short-term; inhibitory control to inhibit a prepotent or automatic response and effortfully execute a subdominant response; and set shifting to switch their attention between two or more sets of competing rules. In addition, sustained attention allows children to concentrate, focus, and engage in learning or social interactions (Rhoades et al., 2011). Several studies indicate that attention and executive

functioning are associated with reading, math, and general academic achievement (Bierman, Nix, et al., 2008; Blair & Razza, 2007; Duncan et al., 2007; Epsy et al., 2004; McClelland et al., 2007; Monette et al., 2011; Raver et al., 2011; Razza et al., 2010; Rhoades et al., 2011; Sabol & Pianta, 2012; Welsh et al., 2010). Executive functioning also has been linked with greater participation and prosocial behavior in the classroom, as well as fewer behavior problems (Bierman, Nix, et al., 2008; Bierman et al., 2009; Riggs et al., 2003; Sabol & Pianta, 2012).

Learning engagement. In addition to academic and cognitive skills, several behavioral skills are also important components of children's readiness. Learning engagement, also referred to as "approaches to learning" in the literature, includes a mix of skills that support children's involvement in the educational process. For example, children's interest, motivation, and positive attitudes toward learning have been shown to predict their academic achievement (Alexander et al., 1993; Ladd, 2000). Persistence, on-task behavior, and classroom participation also have been linked with success in school, whereas inattention and disengagement have been associated with poorer performance (Bierman et al., 2009; Fantuzzo et al., 2004; Hughes & Kwok, 2006; McClelland et al., 2006; McWayne et al., 2004; Snow, 2007). Furthermore, children's early learning engagement has been shown to predict growth in academic achievement through sixth grade (McClelland et al., 2006).

Social-emotional skills. Recent research highlights children's general social-emotional competence as an essential component of school readiness and predictor of achievement over time (Raver et al., 2007; Zins et al., 2004). Children's social skills facilitate productive interactions with their teachers and classmates, and studies indicate that positive peer and student-teacher relationships foster children's academic achievement (Ladd et al., 1996; Hamre & Pianta, 2001). Prosocial interactions have been linked with greater learning engagement and

less disruptive behavior in the classroom (Coolahan et al., 2000). In addition, greater emotion regulation enables children to handle obstacles and frustration, whereas disproportionate reactivity interferes with their ability to manage academic and social challenges in the classroom. Indeed, studies show that children's regulatory skills enable their learning engagement and confer advantage in the academic domain (Dobbs et al., 2006; Fantuzzo et al., 2004; Fantuzzo et al., 2007; Graziano et al., 2007; Raver, 2002; Raver et al., 2007; Rhoades et al., 2011).

Aggression. On the flip side, children's behavior problems put them at risk for learning difficulties and low achievement. When they begin kindergarten, children who exhibit elevated aggression also exhibit poorer language and cognitive skills (Bierman et al., 2009; Dionne, 2005; Doctoroff et al., 2006; Hughes et al., 2000; Kaiser et al., 2002; Speltz et al., 1999). These children show lower academic achievement than their non-aggressive peers over time across elementary school (Campbell et al., 2010; Conduct Problems Prevention Research Group, 1999; Flanagan et al., 2003; Hinshaw, 1992; Miles & Stipek, 2006; Moilanen et al., 2010; NICHD ECCRN, 2004; Trzesniewski et al., 2006). Children's disruptive behavior may lead to conflict-ridden relationships with their teachers and peers, and this, too, may have a detrimental effect on their achievement and learning engagement (Coolahan et al., 2000; Palermo et al., 2007; Stipek & Miles, 2008). Inattention and hyperactivity, which are often comorbid with aggression, also predict reading difficulties and poor academic competence (Friedman-Weieneth et al., 2007; Hinshaw, 1992; Rabiner et al., 2000).

School Readiness in the Context of Risk

To the extent that children come to school with basic competence in these core domains, they are equipped to manage and benefit from their experience in the classroom. There is substantial variability in the school readiness that children exhibit when they begin school,

however. Teachers report that only about half of children transition to school with ease; others struggle with specific or pervasive problems that impede their ability to be successful in the classroom (Rimm-Kaufman et al., 2000). This is troubling, given that children who start school at a disadvantage fall even further behind their classmates as they progress through school (Lee & Burkam, 2002). This issue has become a national priority, reflected in the growing number of interventions and policies aimed to improve school readiness skills among children at risk for poor academic performance (e.g., Bierman, Domitrovich, et al., 2008; National Education Goals Panel, 1997; Raver et al., 2008).

The role of poverty. Children's school readiness and later academic competence are, in part, a function of their exposure to risk prior to school entry. Economic disadvantage and poverty have detrimental effects on children's IQ, executive functioning, and verbal ability (Blair et al., 2011; Duncan et al., 1994; McLoyd, 1998; NICHD ECCRN, 2005; Raver et al., in press; Smith et al., 1997). Compared to more affluent children, lower-income children have poorer early language and numeracy skills, perform worse on standardized achievement tests, and are more likely to require special education services (Lee & Burkam, 2002; McLoyd, 1998). They also display poorer behavioral regulation and prosocial skills at school entry (Hernandez et al., 2007), as well as greater externalizing problems, such as aggression and hyperactivity (Brooks-Gunn & Duncan, 1997; NICHD ECCRN, 2005).

Correlated and cumulative risk. Poverty rarely occurs in the absence of other risk factors that also reduce children's chances for success. Children's poorer cognitive, academic, and behavioral outcomes have been linked to parents' lower educational attainment (Duncan et al., 1994; Janus & Duku, 2007; Lee & Burkam, 2002; Magnuson et al., 2009), single parenthood (DeBell, 2008; Dodge et al., 1994; Duncan et al., 1994; McLanahan & Sandefur, 1994), and

parental stress and depression (Campbell et al., 2007; Cummings & Davies, 1994; Pianta et al., 1990). These effects emerge even when income is statistically controlled, indicating unique pathways of risk through these factors. Within heterogeneous samples ranging in income levels, however, poverty appears to have the strongest effects on children's cognitive and social-emotional outcomes and reduces the observed impact of other risk factors (Brooks-Gunn & Markman, 2005; Duncan et al., 1994).

Given that distal risk factors tend to covary, some work has investigated children's development as a function of the severity or extent of risk exposure, rather than exposure to any single risk factor. Under a cumulative risk approach, researchers have captured risk as a count or standardized average of a wide range of family risk factors, including income, parental education, employment, family structure, parental mental health, stressful life events, large household size, and neighborhood safety (e.g., Burchinal et al., 2008; Rutter et al., 1975). So conceptualized, cumulative risk has been associated with children's cognitive and language abilities, achievement, behavior problems, and psychopathology (Burchinal et al., 2000; Burchinal et al., 2008; Deater-Deckard et al., 1998; Gutman et al., 2003; Kim et al., 2003; Mistry et al., 2010; Rutter et al., 1975; Sameroff et al., 1987).

Parents' Support for Learning

While sociodemographic risk factors play a powerful role in predicting school readiness and school success, research suggests that proximal processes within the family also make substantial contributions. Countless studies have documented the importance of parenting across multiple domains of children's development, including physical health, social and emotional competence, and academic ability (Brooks-Gunn & Markman, 2005; Maccoby and Martin, 1983). In the school readiness literature, parents' sensitivity and warmth have been linked with

children's language and cognitive abilities, academic competence, and behavior problems (Hirsh-Pasek & Burchinal, 2006; Mistry et al., 2010; NICHD ECCRN, 2004; Whittaker et al., 2011). Harsh, punitive, and inconsistent discipline practices have been shown to impair children's cognitive and behavioral outcomes (Bank et al., 1993; Hughes & Ensor, 2006; Yeung et al., 2002; Zaslow et al., 2006). The broad construct of parents' support for children's learning appears to have the strongest and most consistent associations with academic readiness (e.g., Bradley et al., 2001; Burchinal et al., 2008). These benefits may be evident for a variety of reasons. Linguistically and cognitively stimulating activities within and outside the home might facilitate early brain development and, with it, the basic cognitive and behavioral skills that are foundational to success in school. Educationally-relevant experiences can cultivate children's burgeoning interest and motivation toward learning, and parents' explicit teaching of letters and numbers might give children an advantage when they enter school. Across studies, there are three common approaches to the conceptualization and measurement of parents' support for learning. These examine: (1) parents' provision of learning activities; (2) the quality of parents' teaching behaviors; and (3) parents' school involvement.

Provision of learning activities. In this domain, both the frequency and variety of cognitively stimulating learning activities provided by parents are typically measured. Common items capture whether and/or how often parents read to their children, take them to museums or other outings, and encourage them to learn letters and numbers. The Home Observation for Measurement of the Environment (HOME; Caldwell, & Bradley, 1984) is widely used to quantify provision of learning activities and materials (e.g., number of books, number of educational toys), though other similar measures also have been used (e.g., Administration on Children, Youth, and Families, 1998).

Many studies have documented positive associations between parents' provision of learning activities and a wide range of child outcomes. Children with access to learning activities and materials in their homes have higher IQs and general cognitive abilities (Bradley et al., 1989; Burchinal et al., 1997; Burchinal et al., 2008; Fuligni et al., 2004; Linver et al., 2002; Sugland et al., 1995). They perform better on assessments of attention, working memory, and inhibitory control compared to children whose access to learning activities is more limited (Dilworth-Bart et al., 2007; Downer & Pianta, 2006). Parents' provision of learning activities predicts children's achievement in reading and math, as well as their general academic competence (Bradley et al., 2001; Chazan-Cohen et al., 2009; Downer & Pianta, 2006; Foster et al., 2005; Gershoff et al., 2007; Iruka, 2009; Mistry et al., 2010; Yeung et al., 2002). Bookreading and other literacy activities, in particular, are associated with children's early literacy skills (Forget-Dubois et al., 2009; Gest et al., 2004; Senechal & LeFevre, 2002; Weigel et al., 2006). Home learning activities also are associated with children's learning engagement, prosocial skills, and behavioral regulation (Bradley et al., 2001; Chazan-Cohen et al., 2009; Dodge et al., 1994; Foster et al., 2005; Fuligni et al., 2004; Iruka, 2009; Linver et al., 2002; Mistry et al., 2010; Sugland et al., 1995).

Quality of teaching behaviors. While self-report and assessment of the home environment have utility and validity in measuring parents' support for learning, methods that involve careful observation of parents' teaching behaviors during naturalistic experimental tasks provide more specificity (e.g., Matas et al., 1978). These studies often include both free play and "challenge" tasks, where parents and children are instructed to solve a problem (e.g., build a tower, finish a puzzle). Observational studies have shown that the quality of parents' instruction, stimulation, and scaffolding are linked with children's IQ and executive functioning (Bernier et

al., 2010; Englund et al., 2004; Hubbs-Tait et al., 2002; Lengua et al., 2007; Mulvaney et al., 2006; Pianta & Egeland, 1994), as well as their academic achievement and language ability (Ayoub et al., 2011; Berlin et al., 1995; Britto et al., 2006; Chazan-Cohen et al., 2009; Connell & Prinz, 2002; Dodici et al., 2003; Hoff, 2003; Pianta & Harbers, 1996). In addition, the quality of parents' teaching behaviors has been linked to children's behavior regulation, social-emotional competence, and reduced behavior problems (Ayoub et al., 2011; Chazan-Cohen et al., 2009; Connell & Prinz, 2002; Pianta et al., 1991).

School involvement. Parents' involvement in their children's schooling also has been linked to children's academic and social outcomes. Two broad categories are common across several different models of involvement, as assessed by teacher- or parent-report: (1) parents' involvement at home and (2) parents' involvement at school (Epstein, 1996; Fantuzzo et al., 2000; Kohl et al., 2000). Parents' involvement at home, as defined in this literature, is similar to parents' provision of learning activities as described above, but this construct also encompasses activities that are more specifically school-relevant (e.g., parental monitoring of homework), as well as parents' own attitudes and values regarding education. Parents' involvement at school includes parent-teacher communication, alignment of parents' and teachers' goals for children, and parents' volunteering in their children's classrooms or the parent-teacher association (e.g., Fantuzzo et al., 2000; Kohl et al., 2000).

Research suggests that children experience a range of positive outcomes across childhood and adolescence when their families are involved in their education either at school or at home (Fan & Chen, 2001; Hoover-Dempsey et al., 2010; Jeynes, 2005). Consistent with the research on parents' provision of learning activities, studies have documented associations between parents' home-based involvement and children's motivation, attention, and self-control when

they begin school, as well as their early academic and social skills (Fantuzzo et al., 2004; McWayne et al., 2004). Although there is some evidence that parents' involvement at home predicts children's outcomes more strongly than parents' involvement at school (Fantuzzo et al., 2004; Izzo et al., 1999), parents' school-based involvement also has been linked with children's academic competence, including achievement in early literacy and math (Arnold et al., 2008; Galindo & Sheldon, 2012; Hill, 2001; Miedel & Reynolds, 1999; Powell et al., 2010; Schulting et al., 2005). Less research has examined the impact of parents' school-based involvement on children's social and emotional competence, but several studies suggest a link between involvement and children's prosocial skills and reduced disruptive behavior, including conduct problems and hyperactivity (Fantuzzo et al., 2004; Marcon, 1999; McWayne et al., 2004; Powell et al., 2010).

Support for Learning in the Context of Risk

Many of the same risk factors shown to impact children's school readiness and later achievement are also predictors of parents' support for learning. Low income consistently has been shown to have strong negative effects on parents' provision of learning activities, the quality of their teaching behaviors, and their school involvement (Arnold et al., 2008; Brooks-Gunn et al., 1995; Foster et al., 2005; Hart & Risley, 1995; Hoff, 2003; NICHD ECCRN, 2005; Lareau, 2003; Lengua et al., 2007; Linver et al., 2002). In addition, low educational attainment, single parenthood, depression, and stress all predict lower levels of support for learning (Arnold et al., 2008; Englund et al., 2004; Fantuzzo et al., 2000; Kohl et al., 2000; Lengua et al., 2007; NICHD ECCRN, 2005; Semke et al., 2010). When these risk factors are considered together, a family's exposure to cumulative risk has been associated with poorer support for learning (Ayoub et al., 2011; Brooks-Gunn et al., 1995; Burchinal et al., 2008; Lengua et al., 2007).

Compounding these difficulties, families with children who exhibit behavior problems are likely to provide low levels of support for learning, as their interactions often are characterized by conflict, coercive cycles, ineffective discipline, harsh parenting, and physical punishment (Campbell et al., 2010; Dodge et al., 1994; Gershoff, 2002; Greenberg et al., 2001; McFadyen-Ketchum et al., 1996; Miner & Clark-Stewart, 2008; Patterson et al., 1989). Given a tumultuous home environment, it is likely that parents and children engage in fewer learning-related activities. Furthermore, as parents of aggressive children tend to show lower levels of sensitivity, warmth, and monitoring (McFadyen-Ketchum et al., 1996; Miner & Clark-Stewart, 2008; NICHD ECCRN, 2004; Pettit et al., 2001), it is not surprising that aggression in children is associated with lower levels of support for learning, as well (Fantuzzo et al., 2004; Fuligni et al., 2004; Iruka, 2009). In addition, among parents of children with disruptive problems, stress is linked to their home-based and school-based involvement (Semke et al., 2010). Thus, current findings suggest that parents' support for learning may be poorer among families with children exhibiting behavior problems, especially when those families simultaneously experience a host of demographic risks.

Many studies have documented that parents' support for learning accounts for unique variation in children's outcomes after accounting for other risks (Brooks-Gunn, 2003; Brooks-Gunn & Duncan, 1997; Burchinal et al., 2008; Foster et al., 2005; Linver et al., 2002). This suggests that, even among those experiencing risk, variation in parents' support for learning is associated with variation in children's academic, cognitive, and behavioral functioning (e.g., Chazan-Cohen et al., 2009; Fantuzzo et al., 2004; Jackson et al., 2000; McGroder et al., 2000; Zaslow et al., 2006). In fact, parents' support for learning may have greater impact among those experiencing greater risk.

The Present Study

The present study examines longitudinal associations between parents' support for learning and their children's early readiness skills (i.e., academic skills, cognitive ability, learning engagement, social-emotional skills, and aggression) across kindergarten and first grade among low-income families with aggressive children. Although families experiencing greater risk tend to show poorer support for learning, we expected to find variation in this aspect of parenting and explore whether the *effect* of support for learning replicates findings from previous studies with normative or lower-risk samples (e.g., Bernier et al., 2010; Bradley et al., 1989; Bradley et al., 2001; Downer & Pianta, 2006; Lengua et al., 2007; Raver et al., 2007).

In addition, the present study extends prior work by: (1) considering multiple facets of parents' support for learning, (2) exploring the effects of support for learning on children's outcomes in five distinct domains, and (3) examining effects on children's outcomes at school entry as well as growth through first grade. First, although studies have investigated separately parents' provision of learning activities, the quality of their teaching behaviors, and their school involvement, these aspects of support for learning rarely have been considered together in a single study (for exceptions, see Berlin et al., 1995; Chazan-Cohen et al., 2009). Here we utilize parent report, teacher report, and observations of parent-child interactions to more deeply explore the construct of support for learning. Second, prior research has focused on how parents' support for learning affects children's academic achievement and behavior problems. Here we broaden the readiness outcomes of interest by assessing academic skills, cognitive ability, learning engagement, social-emotional skills, and aggression. Finally, most studies demonstrating a link between parents' support for learning and children's competence have been cross-sectional (for exceptions, see Ayoub et al., 2011; Bradley et al., 2001; Burchinal et al., 2006; Downer &

Pianta, 2006; Galindo & Sheldon, 2012; Lengua et al., 2007; Powell et al., 2010). Here we examine both concurrent and predictive relations between parents' support for learning and children's outcomes, and we examine change in children's skills over time after accounting for stability in their skill level. The present study thus adds to this literature by addressing these three areas of limitation.

CHAPTER 2

METHOD

Participants

Participants were 207 children (66% males) and their primary caregivers (89% mothers, 3% fathers)[1] from a low-income, urban setting in Pennsylvania. On average, children were about 6 years old (M = 5.94, SD = 0.39 years) at the kindergarten fall assessment and just over 7 years old (M = 7.24, SD = 0.37 years) at the first grade spring assessment. Children had been identified by their teachers as exhibiting high levels of aggression at the start of kindergarten relative to their classmates. Over 70% of families reported income levels that fell below the federal poverty line. In addition, 98% of parents did not have bachelor's degrees and 67% were single parents. About 73% of children were African American, 19% were Hispanic, and 8% were Caucasian.

Children in 10 elementary schools were screened for aggression at the beginning of kindergarten by teacher report. The screening measure included 10 items rated on a 6-point scale from the Authority Acceptance subscale of the Teacher Observation of Classroom Adaptation—Revised (Werthamer-Larsson et al., 2001; e.g., gets in many fights, breaks rules). A target sample of 207 children who scored in the top quartile of their class on aggression was recruited for participation in a longitudinal research study and intervention trial.[2] At the kindergarten fall assessment, which followed screening procedures by about 4 to 5 months, the average level of conduct problems in this sample was 3.87 (SD = 2.82) out of a possible score of 10 as assessed by teachers on the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). According to SDQ guidelines (Bourdon et al., 2005), 62% of children in this sample were rated in the "medium difficulties" (i.e., score of 3 out of a possible score of 10) or "high difficulties" (i.e.,

[1] Primary caregivers hereafter are referred to as "parents."
[2] A comparison sample of 132 children who scored in the bottom quartile of their class on aggression was also recruited, but these children were not included in the present study because data were not collected on their families.

score of 4 or above out of a possible score of 10) symptom band.

Measures

Following screening and recruitment, data were collected from families, children, and teachers in kindergarten and first grade. In the present study, we used three indicators of parents' support for learning measured in the fall of kindergarten. In addition, we used multiple indicators of five child outcome constructs measured in the fall of kindergarten and spring of first grade: (1) academic skills, (2) cognitive ability, (3) learning engagement, (4) social-emotional competence, and (5) aggression. Sociodemographic covariates assessed in the fall of kindergarten were also included in our analyses. Descriptive statistics for all observed variables are presented in Table 1.

Table 1

Descriptive Statistics

Variable	N	M	SD	Range
Covariates				
Parent Education (years)	199	12.18	1.23	9.00 - 16.00
Income-to-Need	175	0.85	0.70	0.04 - 4.06
Single Parent	203	0.67	0.47	0 - 1
Parent Depression	198	14.87	11.06	0.00 - 53.00
Parent Age	198	31.23	8.06	19.08 - 60.75
Child Sex	207	0.66	0.47	0 - 1
Child Age (kindergarten fall)	204	5.94	0.39	5.23 - 7.26
Attended Head Start	199	0.47	0.50	0 - 1
Attended Preschool	199	0.49	0.50	0 - 1
Treatment Status	207	0.48	0.50	0 - 1
Parents' Support for Learning (K)				
Learning Activities	199	3.72	0.95	1.17 - 5.67
Teaching Behaviors	173	2.07	0.62	1.00 - 3.83
School Involvement	180	1.94	1.00	0.00 - 4.00
Children's Outcomes (K)				
Literacy Skills	205	16.59	6.95	1.00 - 49.00
Literacy Skills (standard score)	205	99.64	14.03	50.00 - 150.00
Math Skills	205	15.63	4.75	0.00 - 29.00
Math Skills (standard score)	205	94.60	12.96	51.00 - 134.00

Variable	N	M	SD	Range
Working Memory	204	1.85	0.76	1.00 - 4.00
Inhibitory Control	199	13.33	3.72	0.00 - 16.00
Global Attention	203	3.20	0.62	1.23 - 4.00
School Readiness	178	3.84	1.18	1.00 - 6.00
Learning Behaviors	179	1.19	0.51	0.00 - 2.00
Classroom Inattention	179	1.61	0.93	0.00 - 3.00
Prosocial Behavior	179	3.08	0.94	1.00 - 6.00
Emotion Regulation	179	3.14	0.99	1.00 - 6.00
Conduct Problems	178	3.87	2.82	0.00 - 10.00
Aggressive Behavior	179	3.05	1.07	1.00 - 5.71
Children's Outcomes (1st)				
Literacy Skills	164	30.97	8.93	8.00 - 59.00
Literacy Skills (standard score)	164	100.52	14.36	51.00 - 135.00
Math Skills	164	21.96	4.87	7.00 - 35.00
Math Skills (standard score)	164	93.48	15.50	50.00 - 134.00
Working Memory	164	2.16	0.76	1.00 - 4.00
Inhibitory Control	164	15.13	6.01	0.00 - 20.00
Global Attention	164	3.05	0.71	1.00 - 4.00
School Readiness	161	3.86	1.23	1.00 - 6.00
Learning Behaviors	161	1.26	0.46	0.23 - 2.00
Classroom Inattention	162	1.48	0.88	0.00 - 3.00
Prosocial Behavior	162	3.43	0.99	1.29 - 6.00
Emotion Regulation	162	3.37	1.00	1.33 - 6.00
Conduct Problems	161	3.78	2.87	0.00 - 10.00
Aggressive Behavior	162	2.90	1.12	1.00 - 5.57

Note. Total $N = 207$. The inhibitory control task administered in kindergarten was Peg Tapping and in first grade was Head-Toes-Knees-Shoulders (Part 1). For ease of interpretation, raw scores are presented for all variables, but log transformations of the following variables were used in analyses: Income-to-Need, Parent Age, Peg Tapping, Head-Toes-Knees-Shoulders, and Global Attention.

Parents' support for learning. Three measures were used to assess parents' support for learning in the fall of kindergarten. Factor loadings for the support for learning latent factor across the five models are shown in Figures 1 to 5. First, parents' provision of *learning activities* was assessed by parent self-report on 6 items adapted from the Home Learning Environment Profile (Heath et al., 1993). Parents indicated when they last participated in a variety of activities

with their children (e.g., worked on an art project, played a sport, read a book), and responses later were re-coded on a 7-point scale from "never" to "almost every day." Scores were the average frequencies across the 6 items. Internal consistency for this measure was low in this sample ($\alpha = .44$), perhaps because of the diversity of activities represented in the items.

Second, the quality of parents' *teaching behaviors* was observed during 3 naturalistic, experimental tasks administered during a home assessment in the fall of kindergarten: (1) a book-reading task, where parents were given a book and instructed to use it with their child as they normally would use a book; (2) a free-play task, where parents were instructed to follow the child's lead as they played with a castle and toys; and (3) a puzzle task, where parents were instructed to help their children complete puzzles without parents touching the puzzle pieces themselves. Each task lasted approximately 5 minutes. Parent-child interactions in each of the tasks were video-recorded and later coded by research staff. Coders rated teaching behaviors in each task on 2 items using a 5-point scale (e.g., parent explains or clarifies, parent makes direct attempts to teach new concepts or ideas). These 2 items captured both the quantity and quality of parents' attempts to encourage children's interests, teach or clarify information, and support or build their understanding. Scores were averaged across the 3 tasks. Internal consistency for this measure was satisfactory ($\alpha = .79$).

Finally, parents' *school involvement* was rated by teachers in the fall of kindergarten on 9 items from the Parent-Teacher Involvement Questionnaire (Kohl et al., 2000). Using a 5-point scale, teachers rated the extent to which parents supported their children's education through their attitudes toward school, participation in the classroom, and support outside the classroom (e.g., how involved are the parents of this child in his or her education, how important does education seem to be to this family). Scores were the average ratings across the 9 items. Internal

consistency for this measure was high in this sample (α = .94).

Children's academic skills. Two well-validated, widely-used subtests of achievement were administered to assess children's academic skills in the fall of kindergarten and spring of first grade. Factor loadings for the academic skills latent factor at each assessment are shown in Figure 1. First, children's early *literacy skills* were assessed with the Letter-Word Identification subtest of the Woodcock-Johnson III Tests of Achievement (Woodcock et al., 2001). Children were asked to identify up to 76 letters and words of increasing difficulty. Responses were coded correct or incorrect, and interviewers discontinued the assessment after 6 consecutive incorrect responses.

Children's early *math skills* were assessed with the Applied Problems subtest of the Woodcock-Johnson III Tests of Achievement (Woodcock et al., 2001). Children were asked to solve up to 39 counting, mathematical, and reasoning problems. Responses were coded correct or incorrect, and interviewers discontinued the assessment after 6 consecutive incorrect responses.

Children's cognitive ability. Three aspects of children's cognitive ability were assessed in the fall of kindergarten and spring of first grade. Factor loadings for the cognitive ability latent factor at each assessment are shown in Figure 2. First, children's *working memory*, a component of executive functioning, was assessed in kindergarten and first grade with the Backward Word Span (Davis & Pratt, 1996). Children were asked to recall a string of up to 6 words they had just heard in reverse order. Scores were the number of words correctly recalled in reverse.

Second, children's *inhibitory control*, another component of executive functioning, was assessed with the Peg Tapping task (Diamond & Taylor, 1996) in kindergarten and with the Head-Toes-Knees-Shoulders task (McClelland et al., 2007) in first grade. In the Peg Tapping task (α = .90), children were asked to tap a pencil once when the experimenter tapped twice and

to tap twice when the experimenter tapped once. Scores were the number of correct trials out of 16. In the Head-Toes-Knees-Shoulders task (α = .93), children were asked to touch their head when the experimenter touched his or her toes and to touch their toes when the experimenter touched his or her head.[3] Children received 2 points for each correct trial out of 10, 1 point for each trial where they self-corrected, and 0 points for each incorrect trial. The Peg Tapping and Head-Toes-Knees-Shoulders distributions were negatively skewed due to ceiling effects, so log transformations of these variables were computed and used in analyses.

Finally, children's *global attention* was assessed in kindergarten and first grade by interviewer report on a measure adapted from a previous study (Smith-Donald et al., 2007). After the child completed the direct assessments of academic skills and cognitive ability, interviewers rated 13 items on a 4-point scale regarding children's ability to sustain attention and engagement throughout the assessment (e.g., pays attention to instructions, sustains concentration). Scores were the average ratings across the 13 items. Internal consistency for this measure was high at the kindergarten fall (α = .92) and first grade spring assessments (α = .94). These distributions were negatively skewed due to ceiling effects in kindergarten and first grade, so log transformations were computed and used in analyses.

Children's learning engagement. Kindergarten teachers reported on children's behavior in the fall of kindergarten, and first grade teachers reported on children's behavior in the spring of first grade. Three teacher-report measures were used to assess children's learning engagement in kindergarten and first grade. Factor loadings for the learning engagement latent factor at each

[3] Another 10 trials were administered in this task where children were asked to continue following the first rule (i.e., touch their head when the experimenter touched his or her toes and vice versa) while also following a new rule (i.e., touch their shoulders when the experimenter touched his or her knees and vice versa). In the current study, only the scores from the first 10 trials were used because the cognitive demand in this portion of the task was more similar to the cognitive demand in the kindergarten inhibitory control task (i.e., Peg Tapping), and we were interested in capturing change in the same construct over time.

assessment are shown in Figure 3. First, children's *school readiness* was assessed with the School Readiness Questionnaire (Bierman, Domitrovich, et al., 2008). Teachers rated 14 items on a 7-point scale about children's social and cognitive skills, attitudes toward schoolwork, and ability to control their behavior and follow instructions (e.g., child seem enthusiastic about learning new things, child is able and willing to follow teacher directions). Scores were the average ratings across the 14 items. Internal consistency for this measure was high at the kindergarten fall ($\alpha = .96$) and first grade spring assessments ($\alpha = .97$).

Second, children's *learning behaviors* were assessed with the Learning Behaviors Scale (McDermott et al., 1999). Teachers rated 8 items on a 3-point scale about children's attitudes and behaviors regarding schoolwork (e.g., sticks to a task with no more than minor distractions, adopts a "don't care" attitude to success or failure [reverse-coded]). Scores were the average ratings across the 14 items. Internal consistency for this measure was high at the kindergarten fall ($\alpha = .83$) and first grade spring assessments ($\alpha = .82$).

Finally, children's *classroom inattention* was assessed with the Inattention subscale of the ADHD Rating Scale (DuPaul, 1991). Teachers rated 8 items on a 4-point scale regarding the extent to which children exhibited inattentive or distracted behaviors in the classroom (e.g., is easily distracted, doesn't seem to listen). Scores were the average ratings across the 8 items, where higher scores reflected greater disengagement and inattention. Internal consistency for this measure was high at the kindergarten fall ($\alpha = .95$) and first grade spring assessments ($\alpha = .93$).

Children's social-emotional skills. Two teacher-report measures were used to assess children's social-emotional skills in the fall of kindergarten and spring of first grade. Factor loadings for the social-emotional skills latent factor at each assessment are shown in Figure 4. Children's *prosocial behavior* was assessed with a subset of items that had been selected and

adapted from the Teacher Social Competence Scale (Conduct Problems Prevention Research Group, 1990). Teachers rated 7 items on a 6-point scale (e.g., shares with others, resolves problems with other children, cooperates). Scores were the average ratings across the 7 items. Internal consistency for this measure was high at the kindergarten fall (α = .92) and first grade spring assessments (α = .92).

Finally, children's *emotion regulation* was assessed with a subset of items that also had been selected and adapted from the Teacher Social Competence Scale (Conduct Problems Prevention Research Group, 1990). Teachers rated 6 items on a 6-point scale (e.g., copes well with disappointment, controls temper, stops and calms down when frustrated). Scores were the average ratings across the 6 items. Internal consistency for this measure was high at the kindergarten fall (α = .86) and first grade spring assessments (α = .82).

Children's aggression. Two teacher-report measures were used to assess children's aggression in the fall of kindergarten and spring of first grade. Factor loadings for the aggression latent factor at each assessment are shown in Figure 5. First, children's *conduct problems* were assessed with the Conduct Problems subscale of the Strengths and Difficulties Questionnaire (Goodman, 1997). Teachers rated 5 items on a 3-point scale regarding children's conduct problems (e.g., often loses temper, often fights with other children, often lies or cheats). Scores were the average ratings across the 5 items. Internal consistency for this measure was high at the kindergarten fall (α = .82) and first grade spring assessments (α = .81).

Second, children's *aggressive behavior* was assessed with a subset of items from the Teacher Observation of Classroom Adaptation–Revised (Werthamer-Larsson, Kellam, & Wheeler, 1991). Teachers rated 7 items on a 6-point scale about children's aggressive and oppositional behavior (e.g., yells at others, fights with other children, ignores or refuses to obey

adults). Scores were the average ratings across the 7 items. Internal consistency for this measure was high at the kindergarten fall (α = .89) and first grade spring assessments (α = .91).

Covariates. Ten variables measured in the fall of kindergarten were included as covariates in each model. *Parent education* was calculated as the years of schooling completed. *Income-to-need* was calculated as the family's total income divided by the poverty threshold for a family of that size (e.g., a ratio of .50 indicates that family income is 50% of the poverty threshold, and a ratio of 2.00 indicates that family income is 200% of the poverty threshold).[4] *Single parent status* was coded "0" if the respondent reported being married or in a committed relationship for over one year and coded "1" if the respondent reported being unmarried and not in a committed relationship for over a year. *Parent depression* was assessed by self-report on a widely used measure of depressive symptoms, the Center for Epidemiological Studies–Depression Scale (Radloff, 1977; α = .90). Depression scores were calculated as the average of 20 items rated on a 4-point scale (e.g., how often did you think your life had been a failure, how often did you feel sad). Other covariates included *parent age*, *child sex* (0 = female, 1 = male), *child age*, whether the child attended *Head Start* (0 = no, 1 = yes), whether the child attended *preschool* (0 = no, 1 = yes), and *treatment condition* (0 = control, 1 = treatment). Income-to-need and parent age were log-transformed to improve skewed distributions.

Intervention

Participants were randomly assigned to treatment (n = 100) or control conditions (n = 107). For families in the treatment condition, intervention activities occurred after the kindergarten fall assessment and throughout kindergarten and first grade (i.e., prior to the first grade spring assessment). Treatment status was included as a covariate because family-level

[4] Several parents chose not to report their income at the kindergarten fall assessment but did report their income at the first grade spring assessment (n = 25). For these participants, we used income reported at first grade spring rather than treat these values as missing in our analyses.

processes, not intervention outcomes, were the focus of the present study. Briefly, the treatment incorporated both school and home components. Children in the treatment condition participated in school-based "Friendship Groups," which targeted self-regulation and social skills across 16 sessions in kindergarten and 12 sessions in first grade. In addition, families in the treatment condition participated in a 10-session home-visiting program across kindergarten and first grade, which targeted positive parent-child relationships, effective and developmentally-appropriate discipline practices, and home-school involvement. Promoting Alternative THinking Skills (PATHS; Kusche & Greenberg, 1994), a universal school-based social-emotional intervention, was delivered to both treatment and control children.

Data Analysis Approach

We first examined descriptive statistics and correlations among the observed variables. Structural equation models (SEM) were utilized to estimate a series of longitudinal models testing the associations between parents' support for learning and children's outcomes. The five child outcomes (i.e., academic skills, cognitive ability, learning engagement, social-emotional skills, and aggression) were examined in separate models, since parents' support for learning could have differential effects on specific aspects of school readiness and adjustment.

Each model tested the association between parents' support for learning at the beginning of kindergarten with children's concurrent outcomes, controlling for the ten covariates. In addition, we simultaneously tested the prediction from parents' support for learning to children's outcomes at the end of first grade, after accounting for the ten covariates and the earlier association between parents' support for learning and children's skills in kindergarten. Thus, the beta coefficient from parents' support for learning to each first grade outcome represents the effect of support for learning on growth (i.e., residual change) in children's skills from

kindergarten to first grade. This approach is a more rigorous test of causal relations among variables obtained via non-experimental designs because it reduces the chance that omitted variables account for the observed structural model. In comparison, estimates of causal paths may be inflated under cross-sectional approaches and even longitudinal approaches that do not account for the initial, concurrent association between independent and dependent variables (Cole & Maxwell, 2003; MacCallum & Austin, 2000).

Because we were interested in examining change in children's outcomes from kindergarten to first grade, we tested for measurement equivalence across time to verify that the latent construct modeled at kindergarten fall was the same latent construct modeled at first grade spring. First, we tested a baseline model where factor loadings were estimated freely. Next, we tested a constrained model where factor loadings of child outcomes were constrained to be equal across the two occasions. A non-significant chi-square change between the two models would indicate invariance across repeated measurements over time. Across models, residual errors of repeated measurements using the same scale were allowed to covary.

All models were estimated using AMOS 20. Full information maximum likelihood was used to handle missing data. Chi-square and goodness-of-fit statistics were examined to assess model fit. Parameter estimates were interpreted after requirements for invariance across time were met and model fit was determined to be adequate.

CHAPTER 3

RESULTS

Preliminary Analyses

The means and standard deviations of the observed variables in the fall of kindergarten and the spring of first grade are presented in Table 1. As might be expected in a high-risk sample, parents' support for learning was fairly low across the three indicators of this construct. Average scores on the Teaching Behaviors and School Involvement measures were below the mid-point on a 5-point scale, and the average score on the Learning Activities measure was only slightly above the mid-point on a 7-point scale. In kindergarten and first grade, children's literacy skills were close to the nationally-normed mean, and children's math skills were slightly below the nationally-normed mean. Children's performance on the measures of cognitive ability was fairly high. Peg Tapping, Head-Toes-Knees-Shoulders, and Global Attention scores were log-transformed to improve skewed distributions due to ceiling effects. Children exhibited high aggression, as reported by teachers, which is not surprising given that we selected children who displayed high levels of aggressive behavior at screening. Even among these highly aggressive children, however, there was variability in their learning engagement and social-emotional skills. On average, children exhibited moderate levels of school readiness, learning behaviors, classroom inattention, prosocial behavior, and emotion regulation.

Correlations among the observed variables are presented in Table 2. Most associations were small to moderate, with higher associations observed for within-construct indicators (e.g., literacy skills and math skills) than cross-construct indicators (e.g., school involvement and literacy skills). Children's outcomes evidenced moderate to high stability, as seen along the diagonal of the matrix in the correlations between kindergarten and first grade measures.

Table 2

Correlations among Key Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
Support for Learning															
1. Learning Activities	--	0.18*	0.11	0.05	0.06	0.03	0.01	0.05	-0.01	0.02	0.13	-0.02	0.03	0.02	0.06
2. Teaching Behaviors	0.18*	--	0.29*	0.14+	0.13	0.09	0.22*	0.11	0.13	0.14	-0.03	0.10	0.06	-0.16+	-0.07
3. School Involvement	0.11	0.29*	--	0.25*	0.13	0.17*	0.04	0.13	0.19*	0.20*	-0.02	0.06	0.09	-0.09	-0.06
Children's Outcomes															
4. Literacy Skills	-0.01	0.07	0.19*	**0.75***	0.60*	0.50*	0.36*	0.33*	0.40*	0.44*	-0.34*	0.11	0.14+	-0.08	-0.01
5. Math Skills	-0.05	0.07	0.02	0.58*	**0.69***	0.42*	0.52*	0.37*	0.31*	0.35*	-0.25*	0.09	0.17*	0.00	0.02
6. Working Memory	-0.02	0.13+	0.11	0.46*	0.45*	**0.35***	0.33*	0.19*	0.16+	0.28*	-0.09	-0.03	0.02	0.10	0.07
7. Inhibitory Control	0.01	0.14+	0.11	0.22*	0.33*	0.37*	**0.23***	0.36*	0.18*	0.20*	-0.19*	0.11	0.11	0.00	-0.05
8. Global Attention	0.00	-0.01	0.01	0.31*	0.43*	0.34*	0.39*	**0.35***	0.24*	0.28*	-0.23*	0.20*	0.14+	-0.20*	-0.16+
9. School Readiness	-0.05	0.09	0.22*	0.42*	0.48*	0.38*	0.35*	0.43*	**0.55***	0.74*	-0.67*	0.73*	0.64*	-0.67*	-0.65*
10. Learning Behaviors	-0.02	0.06	0.15*	0.41*	0.38*	0.36*	0.35*	0.33*	0.72*	**0.37***	-0.61*	0.58*	0.56*	-0.47*	-0.47*
11. Classroom Inattention	0.04	-0.04	-0.14+	-0.33*	-0.29*	-0.27*	-0.25*	-0.39*	-0.76*	-0.62*	**0.45***	-0.45*	-0.41*	0.56*	0.51*
12. Prosocial Behavior	-0.08	0.08	0.19*	0.17*	0.31*	0.19*	0.17*	0.36*	0.71*	0.55*	-0.55*	**0.32***	0.71*	-0.64*	-0.70*
13. Emotion Regulation	-0.03	-0.02	0.06	0.04	0.18*	0.03	0.12	0.30*	0.54*	0.41*	-0.47*	0.71*	**0.40***	-0.61*	-0.68*
14. Conduct Problems	-0.05	0.04	-0.08	-0.07	-0.03	-0.07	-0.08	-0.17*	-0.54*	-0.42*	0.54*	-0.65*	-0.57*	**0.39***	0.86*
15. Aggressive Behavior	0.04	0.02	-0.12	-0.13+	-0.06	-0.09	-0.13+	-0.28*	-0.58*	-0.46*	0.60*	-0.68*	-0.66*	0.88*	**0.40***

Note. Pairwise ns 135 - 205. Correlations with kindergarten child variables are presented below the diagonal. Correlations with first grade child variables are presented above the diagonal. Correlations on the diagonal represent the stability of child outcomes from kindergarten to first grade. + $p < .10$, * $p < .05$.

Teaching Behaviors and School Involvement were more strongly related to first grade child outcomes than to kindergarten child outcomes. The Learning Activities measure generally was not related to child outcomes at either assessment point.

Structural Equation Models

Academic skills. The model treating children's academic skills as the outcome is presented in Figure 1. The freely-estimated model did not fit the data significantly better than the model constraining factor loadings to be equal across time, so measurement invariance across time was supported and imposed, $\chi^2 = 3.84$ ($df = 1$), *n.s.* Based on several fit indices, final model fit was judged to be good, $\chi^2 = 76.70$ ($df = 50$), $p < .05$; CFI = .95; RMSEA = .05. As shown in Figure 1, children's academic skills were highly stable across time, $\beta = .84$, $p < .05$. Controlling for the other variables in the model, the association between parents' support for learning and children's academic skills in kindergarten was significant at the trend level, $r = .23$, $p < .10$. In addition, parents' support for learning was a significant predictor of growth of children's academic skills in first grade after accounting for prior skill level and the covariates, $\beta = .30$, $p < .05$. This suggests that parents' support for learning predicted residual growth in children's academic skills from kindergarten to first grade. As indicated in Table 3, several covariates were also associated with the latent variables in this model: Parent education was positively associated with support for learning; single parent status was negatively associated with kindergarten academic skills; child sex was negatively associated with kindergarten academic skills (i.e., boys showed lower kindergarten academic skills than girls); and child age was positively associated with kindergarten academic skills.

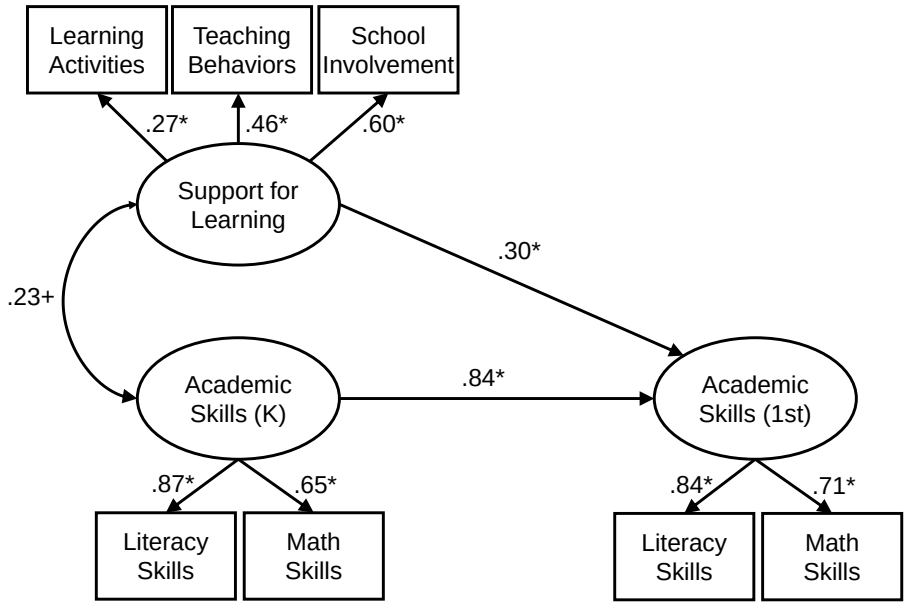

Figure 1. Parents' support for learning was associated at the trend level with academic skills in kindergarten (K) and predicted academic skills in first grade (1st) above and beyond stability in skill level over time. χ^2 = 76.70 (df = 50), $p < .05$. CFI = .95. RMSEA = .05. Covariates included in all models were: parent education (in years), income-to-need (log-transformed), single parent status, parent depression, parent age (log-transformed), child sex, child age at the kindergarten assessment, whether child attended Head Start, whether child attended preschool, treatment status. + $p < .10$, * $p < .05$.

Cognitive ability. The model treating children's cognitive ability as the outcome is presented in Figure 2. The freely-estimated model did not fit the data significantly better than the model constraining factor loadings to be equal across time, so measurement invariance across time was supported and imposed, χ^2 = 0.68 (*df* = 1), *n.s.* Based on several fit indices, final model fit was judged to be good, χ^2 = 103.38 (*df* = 83), *n.s.*; CFI = .93; RMSEA = 04. As shown in Figure 2, children's cognitive ability was moderately stable across time, β = .48, $p < .05$. Controlling for the other variables in the model, the association between parents' support for learning and children's cognitive ability in kindergarten was not significant, *r* = .19, *n*.s; however, parents' support for learning was a significant predictor of children's cognitive ability in first grade after accounting for prior skill level and the covariates, β = .45, $p < .05$. This suggests that parents' support for learning predicted residual growth in children's cognitive

ability from kindergarten to first grade. As indicated in Table 3, several covariates were also associated with the latent variables in this model: Income-to-need was positively associated with kindergarten cognitive ability; child sex was negatively associated with kindergarten cognitive ability and negatively predicted first grade cognitive ability (i.e., boys showed lower kindergarten cognitive ability than girls and showed less growth in cognitive ability from kindergarten to first grade); child age was positively associated with kindergarten cognitive ability; and Head Start attendance negatively predicted first grade cognitive ability.

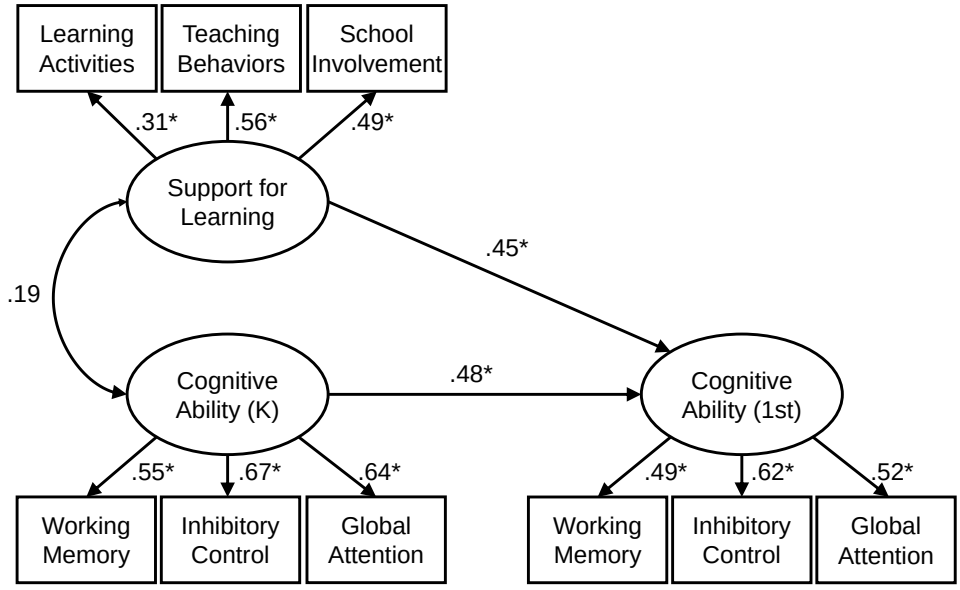

Figure 2. Parents' support for learning was not associated with cognitive ability in kindergarten (K) but it predicted cognitive ability in first grade (1st) above and beyond stability in skill level over time. χ^2 = 103.38 (df = 83), *n.s.* CFI = .93. RMSEA = .04. Covariates included in all models were: parent education (in years), income-to-need (log-transformed), single parent status, parent depression, parent age (log-transformed), child sex, child age at the kindergarten assessment, whether child attended Head Start, whether child attended preschool, treatment status. + $p < .10$, * $p < .05$.

Learning engagement. The model treating children's learning engagement as the outcome is presented in Figure 3. The freely-estimated model did not fit the data significantly better than the model constraining factor loadings to be equal across time, so measurement invariance across time was supported and imposed, χ^2 = 2.54 (*df* = 2), *n.s.* Based on several fit indices, final model fit was judged to be good, χ^2 = 125.74 (*df* = 83), $p < .05$; CFI = .94; RMSEA

= 05. As shown in Figure 3, children's learning engagement was moderately stable across time, β = .63, $p < .05$. Controlling for the other variables in the model, the association between parents' support for learning and children's learning engagement in kindergarten was significant, $r = .28$, $p < .05$; however, parents' support for learning was not a significant predictor of children's growth in learning engagement in first grade after accounting for prior skill level and the covariates, β = .01, *n.s.* That is, parents' support for learning was related to initial levels of children's learning engagement, but it did not predict residual growth in learning engagement from kindergarten to first grade. As indicated in Table 3, several covariates were also associated with the latent variables in this model: Parent education was positively associated with support for learning; child sex was negatively associated with kindergarten learning engagement (i.e., boys showed lower kindergarten learning engagement than girls); child age was positively associated with kindergarten learning engagement; and treatment status was negatively associated with kindergarten learning engagement and positively predicted first grade learning engagement at the trend level.

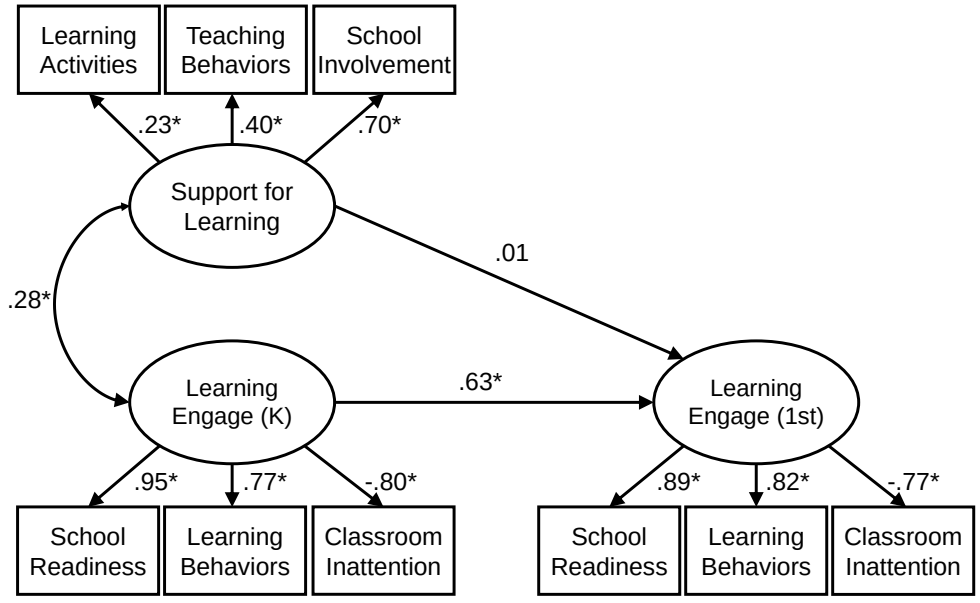

Figure 3. Parents' support for learning was associated with learning engagement in kindergarten (K) but did not predict learning engagement in first grade (1st) above and beyond stability in skill level over time. $\chi^2 = 125.74$ (df =

83), $p < .05$. CFI = .94. RMSEA = .05. Covariates included in all models were: parent education (in years), income-to-need (log-transformed), single parent status, parent depression, parent age (log-transformed), child sex, child age at the kindergarten assessment, whether child attended Head Start, whether child attended preschool, treatment status. + $p < .10$, * $p < .05$.

Social-emotional skills. The model treating children's social-emotional skills as the outcome is presented in Figure 4. The freely-estimated model did not fit the data significantly better than the model constraining factor loadings to be equal across time, so measurement invariance across time was supported and imposed, $\chi^2 = 2.18$ ($df = 1$), *n.s.* Based on several fit indices, final model fit was judged to be adequate, $\chi^2 = 80.38$ ($df = 50$), $p < .05$; CFI = .92; RMSEA = .05. As shown in Figure 4, children's social-emotional skills were moderately stable across time, $\beta = .37$, $p < .05$. Controlling for the other variables in the model, the association between parents' support for learning and children's social-emotional skills in kindergarten was not significant, $r = .20$, *n.s.* Parents' support for learning also did not predict children's social-emotional skills in first grade after accounting for prior skill level and the covariates, $\beta = .03$, *n.s.* This suggests that parents' support for learning was not significantly associated with children's social-emotional skills in kindergarten or first grade. As indicated in Table 3, several covariates were also associated with the latent variables in this model: Parent education was positively associated with support for learning; parent depression was positively associated with support for learning at the trend level; child sex was negatively associated with kindergarten social-emotional skills and negatively predicted first grade social-emotional skills (i.e., boys showed lower kindergarten social-emotional skills than girls and showed less growth in social-emotional skills from kindergarten to first grade); and child age was positively associated with kindergarten social-emotional skills.

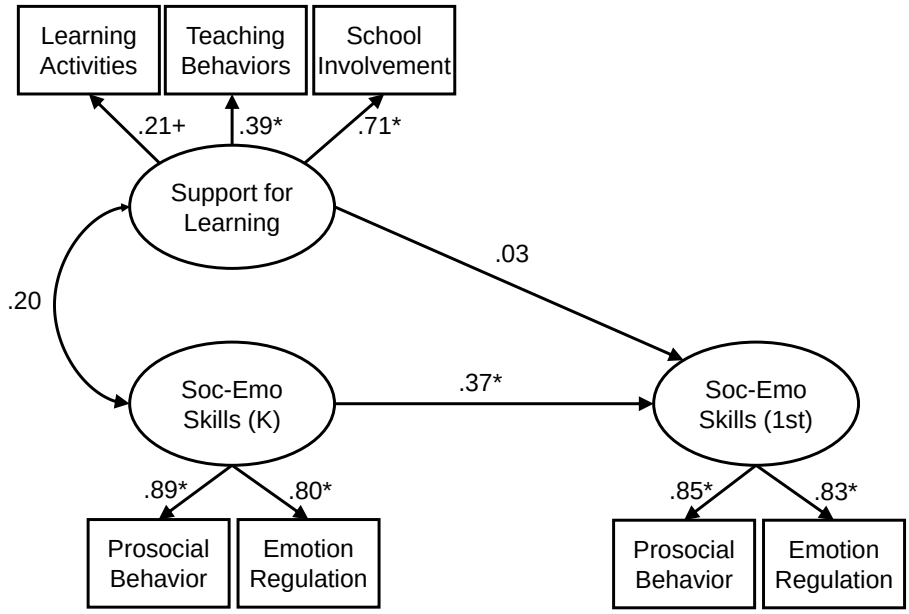

Figure 4. Parents' support for learning was not associated with social-emotional skills in kindergarten (K) and did not predict social-emotional skills in first grade (1st) above and beyond stability in skill level over time. χ^2 = 80.38 (df = 50), $p < .05$. CFI = .92. RMSEA = .05. Covariates included in all models were: parent education (in years), income-to-need (log-transformed), single parent status, parent depression, parent age (log-transformed), child sex, child age at the kindergarten assessment, whether child attended Head Start, whether child attended preschool, treatment status. + $p < .10$, * $p < .05$.

Aggression. The model treating children's aggression as the outcome is presented in Figure 5. The freely-estimated model did not fit the data significantly better than the model constraining factor loadings to be equal across time, so measurement invariance across time was supported and imposed, χ^2 = 1.85 (*df* = 1), *n.s.* Based on several fit indices, final model fit was judged to be adequate, χ^2 = 93.05 (*df* = 52), $p < .05$; CFI = .93; RMSEA = .06. As shown in Figure 5, children's aggression was moderately stable across time, β = .44, $p < .05$. Controlling for the other variables in the model, the association between parents' support for learning and children's aggression in kindergarten was not significant, *r* = -.11, *n.s.* Parents' support for learning also did not predict children's aggression in first grade after accounting for prior skill level and the covariates, β = -.15, *n.s.* This suggests that parents' support for learning was not significantly associated with children's aggression in kindergarten or first grade. As indicated in

Table 3, several covariates were associated with the latent variables in this model: Parent education was positively associated with support for learning; child sex was positively associated with kindergarten aggression (i.e., boys showed higher kindergarten aggression than girls); and preschool attendance was negatively associated with kindergarten aggression at the trend level.

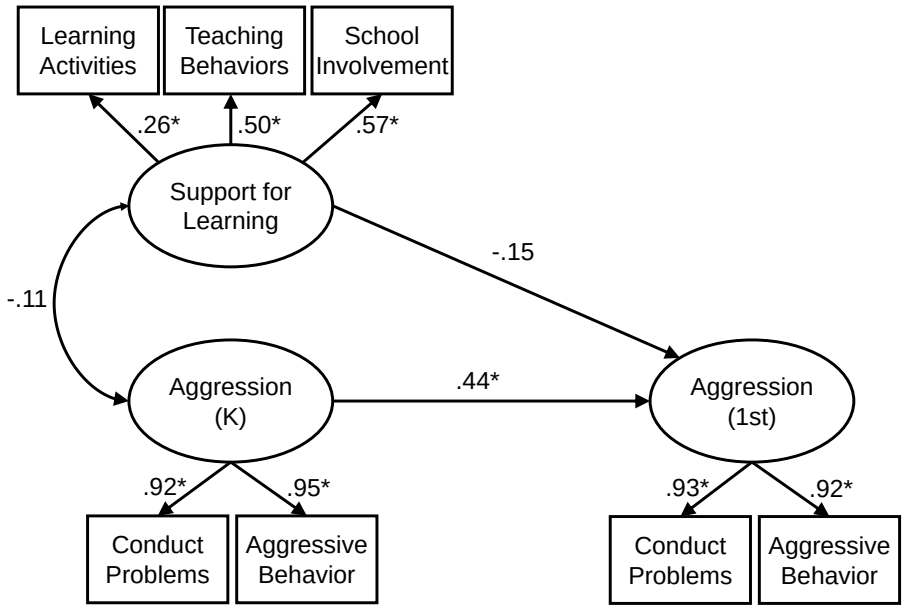

Figure 5. Parents' support for learning was not associated with aggression in kindergarten (K) and did not predict aggression in first grade (1st) above and beyond stability in skill level over time. χ^2 = 93.05 (df = 52), $p < .05$. CFI = .93. RMSEA = .06. Covariates included in all models were: parent education (in years), income-to-need (log-transformed), single parent status, parent depression, parent age (log-transformed), child sex, child age at the kindergarten assessment, whether child attended Head Start, whether child attended preschool, treatment status. + $p < .10$, * $p < .05$.

Table 3

Covariate Parameter Estimates across Five Structural Equation Models

	Academic Skills			**Cognitive Ability**			**Learning Engagement**			**Social-Emotional Skills**			**Aggression**		
	Supp Learn	K Out-come	1st Out-come	Supp Learn	K Out-come	1st Out-come	Supp Learn	K Out-come	1st Out-come	Supp Learn	K Out-come	1st Out-come	Supp Learn	K Out-come	1st Out-come
Parent Education	0.36*	0.12	-0.05	0.38*	0.16+	-0.18	0.31*	0.10	0.01	0.30*	0.07	-0.02	0.37*	-0.05	0.14
Income-to-Need	0.17	0.08	-0.03	0.15	0.33*	-0.01	0.16	0.00	0.06	0.16	-0.02	-0.06	0.18	0.04	-0.10
Single Parent	0.06	-0.18*	-0.01	0.08	-0.07	-0.09	0.03	-0.11	-0.11	0.02	-0.01	-0.10	0.06	-0.01	0.07
Parent Depression	0.18	-0.02	-0.09	0.10	-0.13	-0.01	0.22+	0.01	0.03	0.23+	-0.05	-0.02	0.15	-0.04	0.04
Parent Age	0.12	0.15+	-0.09	0.07	0.01	-0.08	0.16	0.05	0.03	0.16	0.03	0.03	0.11	-0.01	0.01
Child Sex	-0.05	-0.23*	-0.11+	-0.03	-0.24*	-0.30*	-0.07	-0.40*	-0.08	-0.07	-0.25*	-0.18*	-0.05	0.20*	0.09
Child Age	-0.16	0.36*	-0.11	-0.14	0.31*	0.19	-0.13	0.29*	-0.07	-0.12	0.21*	-0.12	-0.13	-0.01	0.03
Head Start	0.09	-0.06	-0.08	0.09	-0.14	-0.22*	0.08	-0.10	0.02	0.08	-0.13	-0.07	0.09	0.08	-0.05
Preschool	-0.08	0.03	0.02	-0.11	0.08	0.02	-0.05	0.00	-0.01	-0.05	0.00	-0.03	-0.09	-0.13+	0.13
Treatment Status	0.10	-0.06	0.03	0.09	0.03	-0.10	0.11	-0.16*	0.14+	0.11	-0.12	-0.01	0.10	0.05	-0.02

Note. Supp Learn = Support for Learning. K = kindergarten. 1st = first grade. Support for Learning and K Outcome parameters are correlation coefficients (*r*). 1st Outcome parameters are beta coefficients (β) where the first grade child outcome was regressed on the covariates. Income-to-need and parent age were log-transformed. + $p < .10$, * $p < .05$.

CHAPTER 4

DISCUSSION

The current study examined variation in parents' support for learning and children's early school-related outcomes within a sample of low-income ethnic-minority families whose children were already showing high rates of aggression in kindergarten. We explored whether parents' support for learning was related concurrently to children's functioning at the start of kindergarten in five domains of school readiness. We also explored whether parents' support for learning predicted differential growth in children's functioning from the fall of kindergarten to the spring of first grade. Results highlighted the importance of parents' support for learning for their children's outcomes, even when background family characteristics reflecting risk were included as covariates. Different patterns of associations were evident at school entry and at the end of first grade depending on the specific child skill domain considered. Specifically, support for learning predicted children's academic skills and cognitive ability most strongly at the end of first grade. In contrast, support for learning was associated with children's learning engagement at school entry, but it did not predict growth in these skills through the end of first grade. Support for learning was not significantly associated with children's social-emotional skills or aggression in either kindergarten or first grade.

The Role of Parents' Support for Learning in a High-Risk Sample

Parents' support for learning has been identified as a mechanism through which contextual risk factors, particularly low income, influence children's development (e.g., Brooks-Gunn, 2003; Burchinal et al., 2008; Linver et al., 2002). Rather than examine variation in parents' support for learning across a wide range of income levels, however, the current study explored variation in parents' support for learning *within* a low-income sample of children who

already were showing high rates of aggression in kindergarten. Not only were families in this sample low in income (over 70% below poverty); they also were primarily single parents (67%) with low educational attainment (98% without bachelor's degrees), and they were living in high-crime neighborhoods with very poorly-achieving schools. Children in these families are at very high risk for poor social-emotional and educational outcomes, as early aggression is a strong predictor of later development (Dodge & Pettit, 2003). Understanding variation within this very high-risk sample may shed light on specific processes that may promote positive outcomes among urban children at the highest risk for social and academic failure (Mistry et al., 2010). Results of the current study suggest that, even among very disadvantaged families with children exhibiting early behavior problems, parents' support for learning fosters children's academic skills, cognitive ability, and learning engagement.

The primary aim of the current study was to examine associations among parents' support for learning and children's functioning in kindergarten and first grade. Whereas most studies have focused on a single outcome variable, usually children's academic skills, the current study used multiple indicators to model latent factors in five different skill domains that are critical to children's school readiness and adjustment: academic skills, cognitive ability, learning engagement, social-emotional skills, and aggression. The observed associations between parents' support for learning and children's outcomes partially supported our hypotheses. Support for learning was associated with several skill domains, but associations differed across time points and areas of functioning.

Parents' support for learning predicted growth in children's academic skills and cognitive ability between kindergarten and the end of first grade. These longitudinal associations are particularly striking, given that children's academic skills and cognitive ability both were quite

stable from kindergarten to first grade. Because early literacy, math, and domain-general cognitive skills are highly predictive of later academic success (Blair & Razza, 2007; Duncan et al., 2007; Welsh et al., 2010), these results underscore the importance of parents' early support for their children's learning. Furthermore, this study contributes to the literature by demonstrating that support for learning at school entry predicts change in skills during the first crucial years of schooling among children with early-manifesting behavior problems. We cannot draw definitive causal connections because this was a non-experimental study, but accounting for baseline levels and initial associations among variables strengthens the confidence in these findings (Cole & Maxwell, 2003; MacCallum & Austin, 2000).

It was surprising that parents' support for learning was only marginally associated with initial academic skills and was not associated with initial cognitive ability, yet did predict growth in both areas between kindergarten and first grade. Interestingly, parent support was related to early learning engagement, which may have impacted the growth of academic and cognitive skills. Typically, correlations between variables are strongest when they are measured concurrently and become weaker as the lag between measurements increases. Although the reason for this remains unclear, perhaps there was more "developmental noise" at the start of kindergarten in the measures of academic skills and cognitive ability, since maturation may have been occurring at different rates for these children. It is possible that this noise was partially reduced as children matured and as schooling impacted the growth of these skills, allowing the effect of parents' support for learning to be detected more readily at the end of first grade.

At the start of kindergarten, parents' support for learning was significantly associated with children's learning engagement, which encompassed behavioral skills such as children's attitudes toward schoolwork, on-task performance, and ability to follow instructions and ignore

distractions. Children whose parents provide high levels of support for learning may be better equipped to handle some of the academic and behavioral demands they experience as they transition to formal schooling. They have an advantage over fellow first-time students because they are more familiar with educational materials, versed in learning-related routines, and prepared to engage in the learning process. Replicating results found with non-aggressive children (Chazan-Cohen et al., 2009; Mistry et al., 2010), our results suggest that parents' support for learning has positive effects even among high-risk, early aggressive children. While parent support predicted the growth of academic skills and cognitive ability, it did not predict growth in children's learning engagement from kindergarten to first grade. Once children begin school, change in learning engagement may be less affected by parents' support for learning than by other factors, such as teacher-guided peer interactions and other classroom experiences.

Although results indicated positive effects of parents' support for learning in other skill domains, support for learning was not significantly related to children's social-emotional skills or their aggression in kindergarten or first grade. This was unexpected, given prior work that has linked these outcomes to parents' provision of learning activities, teaching behaviors, and school involvement (e.g., Chazan-Cohen et al., 2009; Connell et al., 2002; Fantuzzo et al; 2004; Fuligni et al., 2004; Linver et al., 2002; Mistry et al., 2010). Because we selected participants who had screened high on aggression, however, our sample was likely much more aggressive and less social-emotionally skilled on average than samples used in other studies. Our results suggest that, among children with early and severe behavior problems, parents' support for learning may not be sufficient to induce positive change in social behavior. Although support for learning did account for variation in academic skills, cognitive ability, and learning engagement among these high-risk children, it did not predict what little variation in social-emotional skills and aggression

exists at this extreme.

Unpacking Parents' Support for Learning

Whereas previous studies have examined separately parents' provision of learning activities (e.g., Burchinal et al., 2008; Fuligni et al., 2004; Linver et al., 2002), the quality of parents' teaching behaviors (e.g., Ayoub et al., 2011; Bernier et al., 2010; Lengua et al., 2007), or parents' school involvement (e.g., Fantuzzo et al., 2004; McWayne et al., 2004), the current study adds to the literature by using a latent-variable approach to consider simultaneously these three indicators of support for learning. Capitalizing on a multi-method design, we utilized teacher report, parent report, and observer ratings to capture support for learning across parenting domains and across contexts. In general, results suggest that this is a promising analytic approach, as associations between the support for learning latent variable and children's outcomes were stronger than the bivariate associations among the manifest indicators of parenting and children's skills. This trend indicates that considering these three indicators together is more informative than considering any one indicator on its own.

Differences in the support for learning factor loadings are worth noting, however. Across models, observer-rated teaching behaviors and teacher-reported school involvement showed moderate to high factor loadings, whereas parent-reported learning activities showed relatively low factor loadings. Several alternative explanations might account for this pattern. These differential loadings may suggest that parents' support for learning is reflected more by the quality of certain behaviors as coded by observers than by the frequency of discrete activities as assessed by parents' self-report. For example, parents' educational goals for their children and encouragement of their questions or ideas—whether assessed by observers or teachers—might be better indicators of the support children experience at home on a regular basis. This quality of

support might permeate children's environments regardless of whether or how often they engage in particular learning activities with their parents. Alternatively, this pattern of factor loadings might be the result of poor measurement of learning activities. In the current study, the Home Learning Environment Profile (Heath et al., 1993) did not show high internal consistency. In our high-risk sample, this measure may have missed important activities that comprise parents' support for learning or included activities that were not relevant. Furthermore, if certain kinds of learning activities are more important indicators of support than others, this information was not captured because we averaged across items on a wide range of activities (e.g., reading, playing a sport, working on a puzzle). Finally, it is also possible that parents were not accurate reporters of the frequency with which they provided their children with learning activities.

Although the impact of contextual risk factors on parents' support for learning was not the primary focus here, the pattern of associations among support for learning and the covariates warrants discussion. Each model included ten covariates: years of parents' education, income-to-need ratio, single parent status, parent depression, parent age, child's sex, child's age, Head Start attendance, preschool attendance, and treatment status. Of these covariates, parents' education level showed the only consistent, significant association with support for learning across all five models. This moderate relation is not surprising, since more educated parents may be better equipped to provide learning support to their children. In addition, parents who value education or who are skilled academically may be more likely both to pursue higher levels of education for themselves *and* support their children's learning. In contrast, the lack of association between income-to-need and support for learning perhaps *is* somewhat surprising, given the multitude of studies documenting this link (Arnold et al., 2008; Brooks-Gunn et al., 1995; Foster et al., 2005; Hart & Risley, 1995; Hoff, 2003; NICHD ECCRN, 2005; Lareau, 2003; Lengua et al., 2007;

Linver et al., 2002). It is probable that this nonsignificant association is sample-specific, since nearly 70% of families in this study fell below the poverty line. Significant associations would be unlikely to emerge in such a restricted range in income-to-need, especially since other correlated risk factors (e.g., parents' education) were also included in these models.

Limitations

A few limitations of the current study should be noted. First, although our longitudinal design and analytic approach enabled us to more rigorously test causal relations among variables compared to other longitudinal or cross-sectional analyses, firm causal conclusions cannot be drawn because the data were non-experimental. Although covariates such as parents' level of education, income-to-need, single parent status, parent depression, and parent age were controlled in our models, it is possible that the associations we observed were caused by an omitted variable, such as parents' IQ, shared genes between parents and children, or correlated parenting behaviors like sensitivity or discipline practices. In future work, this limitation could be addressed by applying stronger causal inference methods, such as propensity score analyses.

The unique nature of this high-risk sample is a great strength because it enables us to explore and identify factors that influence this particular stratum of children. The uniqueness of the sample also limits the generalizability of our results to a broader, lower-risk population, however. For example, our results indicated that, among very high-risk families, variability within a restricted range of income-to-need generally was not associated with parents' support for learning or children's outcomes (except cognitive ability in kindergarten). Of course, our results should not be interpreted to mean that income does not play a role in representative populations, a result that has been reported consistently (e.g., Duncan et al., 1994; Linver et al., 2002; McLoyd, 1998; NICHD ECCRN, 2005; Lengua et al., 2007); it is probable that significant

associations did not emerge because of the restricted range in this sample.

Two analytic challenges should also be noted. First, although we used multi-method indicators to create the latent variables, the same kindergarten teacher reported on parents' school involvement (one of the three indicators of parents' support for learning) and the indicators of children's kindergarten outcomes in three domains: learning engagement, social-emotional competence, and aggression. It is possible, then, that the concurrent association between parents' support for learning and children's learning engagement was due to shared method variance. Significant associations still emerged in other skill domains, however, where there was no shared method variance. Our second analytic challenge was in handling that about half of the sample received an intervention between the kindergarten and first grade assessments. Ideally, we would have tested our models for invariance across treatment and control groups, but our sample size was too small for these analyses. Instead, we included treatment status as a covariate to control for treatment effects.

Future Directions

Further research might explore several related questions that were not addressed here. Our models assumed a primarily unidirectional link from parents' support for learning to children's outcomes, but it is possible that this association is transactional (Englund et al., 2004). Through their engagement and enjoyment of learning, high-skilled children might encourage their parents to maintain or increase support for learning over time. In contrast, children who are disengaged, unruly, and lesser-skilled might elicit frustration from their parents, who consequently decrease their efforts to support their children's learning. This might be an important process among early aggressive children, such as those in our sample, given the large body of work on coercive interactions that occur within these families (e.g., Miner & Clark-

Stewart, 2008; Patterson et al., 1989). Over time, these children might experience less and less support for learning at home, coupled with difficulties learning at school.

Another area for future research is exploring the moderating conditions under which parents' support for learning is more or less effective. For example, overall parent-child relationship quality might moderate the impact of support for learning since parenting practices are best understood in the context of the broader parenting style (Darling & Steinberg, 1993). Studies have demonstrated that maternal warmth, authoritative parenting, appropriate discipline practices, and positive affect during learning-related activities moderate the effect of support for learning (Gest et al., 2004; Pomerantz et al., 2005; Simpkins et al., 2006; Steinberg et al., 1992). For example, some work suggests that support for learning is only associated with achievement when mothers and children share a warm relationship (Simpkins et al., 2006) or when parents do not endorse a willingness to use physical punishment with their children (Gest et al., 2004). Other moderators of the effect of parents' support for learning might include children's baseline skill level or the quality of their daycare or preschool experiences.

Implications for Prevention and Intervention

The current study suggests that parents' support for learning promotes children's academic, cognitive, and behavioral skills, despite high levels of both family contextual risk and child behavioral risk. This is promising news. Low income, low levels of parents' education, and other correlated distal risk factors can have extreme, long-lasting negative consequences for families and children (Duncan et al., 1994; McLoyd, 1998; NICHD ECCRN, 2005), but they may not be so overpowering that they entirely obstruct parents' ability to support their children's learning. Our results suggest that support for learning is one promising point of entry for prevention and intervention, as there may be opportunities for growth in the quantity and quality

of support for learning among high-risk families.

In fact, several interventions have been designed to impact parenting behaviors, including support for learning, that are linked to children's school-related outcomes. Parent engagement and involvement is now a major priority of Head Start programs across the country (Hindman et al., in press; Weiss et al., 2005). In home-visiting programs, such as the Nurse-Family Partnership, low-income mothers learn about the importance of providing stimulating activities for their infants and children, in addition to more general principles of child development (Olds, 2002). The Incredible Years Parent Program, which was originally developed to prevent children's conduct problems through parent management training, places new emphasis on parents' support for learning at home and at school (Webster-Stratton & Reid, 2010). Support for learning is also a primary target of newly developed school readiness interventions, such as Getting Ready (Sheridan et al., 2010), which involves home visits by teachers to set learning goals with parents and discuss children's development at home and at school.

There is evidence that these diverse intervention approaches improve children's readiness for school and even predict long-term achievement and educational attainment (Olds, 2002; Reynolds & Shlafer, 2010; Sheridan et al., 2010; Webster-Stratton et al., 2008). Most studies, however, have not tested whether parents' support for learning actually improves as a result of intervention and, in fact, mediates intervention effects on children's outcomes. Further, because many of these interventions are multi-component, it is not clear whether improvements in parents' support for learning *alone* could produce long-lasting positive impacts for children. More research is needed to determine whether these interventions produce enduring impacts on parents' support for learning and children's outcomes. Future work might also explore whether programs with a more narrow focus on parents' support for learning (e.g., Getting Ready) are

sufficient to produce change, or if comprehensive, multi-component approaches (e.g., The Incredible Years series) are necessary for sustained positive outcomes in aggressive children.

Summary and Conclusions

Young children's experiences prior to kindergarten may facilitate or hinder their successful transition to school, as well as their ongoing adjustment and achievement across the school years. Parents' support for learning appears to be one process that promotes children's early academic skills, cognitive ability, and learning engagement, even among early-identified aggressive children in high-risk family contexts. Interventions that promote high quality and quantity of parents' support for learning may be a promising approach through which to foster the skills children need to succeed in and out of school.

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