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## Parent Involvement and Children's Academic and Social Development in Elementary School

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### Abstract

Data from the NICHD Study of Early Childcare and Youth Development ( $N= 1364$ ) were used to investigate children's trajectories of academic and social development across first, third and fifth grade. Hierarchical linear modeling was used to examine within- and between-child associations among maternal- and teacher-reports of parent involvement and children's standardized achievement scores, social skills, and problem behaviors. Findings suggest that within-child improvements in parent involvement predict declines in problem behaviors and improvements in social skills but do not predict changes in achievement. Between-child analyses demonstrated that children with highly involved parents had enhanced social functioning and fewer behavior problems. Similar patterns of findings emerged for teacher- and parent-reports of parent involvement. Implications for policy and practice are discussed.

### Parent Involvement and Children's Academic and Social Development in Elementary School

A recent report by Herrold and O'Donnel (2008) from the National Center for Education Statistics found that over 90% of parents of elementary school children reported attending general school meetings, like those for the PTA/PTO, as well as participating in regularly scheduled parent teacher meetings throughout the school year. Roughly 80% of parents in the nationally representative sample reported attending school events and about 60% reported volunteering in the classroom. Parent involvement is often considered a pathway through which schools enhance the achievement of underperforming children (Berger, 1991). Consequently, parent involvement is encouraged by teachers, childcare providers, policy makers, parents, and researchers (Duch, 2005; Sheldon & Epstein, 2005). Moreover, parent involvement is a key component of early childhood education programs, such as Head Start. These programs encourage parent involvement by inviting parents to participate in activities at school and facilitating parent-teacher communication.

Over the years, a large literature has documented the importance of parent involvement for young children. The role of parent involvement in the later years of schooling has received less attention. Past research on parent involvement has also been more heavily focused on associations with student achievement, with less attention to social and emotional domains of children's development. This propensity may be attributed to the academic nature of many of the behaviors defined as parent involvement like helping with homework. Such activities should prompt more enrichment at home and attunement to a child's academic progress. However, teachers and parents may discuss children's behavior in the classroom as well, since behavior problems and social functioning may have immediate consequences for the

classroom environment and teachers' instructional efforts. The aim of this study is to extend past research by examining within- and between-child associations among parent involvement and children's academic and socioemotional trajectories during elementary school.

### Parent Involvement in Early Childhood

Parent involvement typically involves parents' behaviors in home and school settings meant to support their children's educational progress. Measures of parent involvement commonly include the quality and frequency of communication with teachers as well as participation in school functions and activities (Dearing, McCartney, Weiss, Kreider, & Simpkins, 2004; Dearing, Kreider, Simpkins, & Weiss, 2006; Machen, Wilson & Notar, 2004). Parent involvement also characterizes parents' values and attitudes regarding education and the aspirations they hold for their children (Catsambis, 2001; Englund, Luckner, Whaley, & Egeland, 2004). Although values and attitudes may not directly influence academic outcomes, they may enhance academic achievement indirectly by promoting children's motivation and persistence in challenging educational tasks.

Parent involvement bridges two key contexts in children's early development, namely the home and school settings. Within an ecological framework (Bronfenbrenner & Ceci, 1994), the home and school contexts are characterized as autonomous microsystems and parent involvement is conceptualized as a mesosystem, which is made up of interactions between key microsystems. Although each setting can independently influence a child, together the home and school contexts interact to offer a unique influence. In this study parent involvement is conceptualized as a product of the interaction between the influences of school and home settings by providing continuity between the two environments. For example, if parents are aware of a teacher's instructional goals, they may provide resources and support for those learning aims at home. Similarly, in terms of social development, parent involvement may facilitate the development of consistent disciplinary approaches across home and school. Accumulating evidence suggests that these parenting practices are associated with higher academic success in the early grades, although links to socioemotional outcomes remain less clear.

**Academic Achievement**—Past research on parent involvement and children's academic skills is mixed (Fan & Chen, 2001). Some studies have found no significant association between parent involvement and academic achievement (Keith, Reimers, Fehrman, Pottebaum, & Aubey, 1986; Okpala, Okpala, & Smith, 2001; Reynolds, 1992; White, Taylor, & Moss, 1992) and a few have even detected negative associations (Milne, Myers, Rosenthal, & Ginsburg, 1986; Sui-Chu & Willms, 1996). Yet, positive associations between parent involvement and academic achievement have been demonstrated repeatedly in the literature. A recent meta-analysis by Fan and Chen (2001) finds moderate associations between parent involvement and an array of learning-related or academic skills, such as achievement motivation, task-persistence, and receptive vocabulary, during preschool and kindergarten. With a predominant research focus on parent involvement and achievement in either preschool and kindergarten or high school, the potentially supportive role of parent involvement during middle childhood remains understudied.

Past non-experimental research on parent involvement commonly investigates contemporaneous associations between parent involvement and academic achievement. These studies typically examine within-grade associations of parent involvement and academic skills (Fantuzzo, McWayne, & Perry, 2004; Gonzalez-DeHass, Willems, & Holbein, 2005; McWayne, Hampton, Fantuzzo, Cohen, & Sekino, 2004). Other work incorporates contemporaneous research in the early grades with longitudinal follow-up data

later in elementary school or beyond (Englund et al., 2004; Izzo, Weissberg, Kasprow, & Fendrich, 1999; Miedel & Reynolds, 1999). For example, Miedel and Reynolds (1999) detected positive associations between parent involvement in preschool and kindergarten and reading achievement in kindergarten and in eighth grade. Izzo and colleagues (1999) also found significant positive associations between average parent involvement in early elementary school and socioemotional development and achievement in later elementary school. Such studies reflect the common practice of considering parent involvement as a static predictor of concurrent achievement or educational outcomes in later school years. A notable exception is a study by Dearing and colleagues (2006) which employed longitudinal data on parent involvement and reading achievement to examine within- and between-family associations of parent involvement and literacy across elementary school. Findings suggested that differences in levels of parent involvement between-families and changes in parent involvement within-families were both predictive of children's literacy skills, and increasing parent involvement during elementary school improved literacy growth.

**Socioemotional Development**—Parent involvement is generally thought of as an avenue for promoting academic performance. However, parent involvement may also enhance children's behavior at home and in the classroom as parents and teachers work together to enhance social functioning and address problem behaviors. A growing literature has demonstrated benefits of parent involvement for social functioning (Izzo et al., 1999; McWayne et al., 2004; Reynolds, 1989; Rimm-Kaufman, Pianta, Cox, & Bradley, 2003; Supplee, Shaw, Hailstones, & Hartman, 2004). For example, a recent study of Head Start students revealed that parent involvement was associated with lower conduct problems (Fantuzzo et al., 2004). Such findings are also evident in adolescence (Hill, Castellino, Lansford, Nowlin, Dodge, Bates, & Pettit, 2004). However, studies addressing parent involvement's links to socioemotional skills have typically focused on early childhood and utilized cross-sectional designs.

### Research Questions

The aim of the current study is to extend past research by examining within- and between-child associations among parent involvement and academic and socioemotional trajectories during elementary school. In doing so, this investigation addresses the heavy reliance on contemporaneous, within-grade research during early childhood in past literature by examining associations between parent involvement and academic and socioemotional functioning longitudinally throughout middle childhood.

### Analytic Strategy

A major challenge facing researchers is determining whether parent involvement itself is actually beneficial to children or whether parents who are more engaged and involved in children's schooling also differ in key selection characteristics (e.g., motivation, cognitive competence) from less involved parents. If the most competent parents with developmentally advanced children are more likely to be involved in school, this could lead to an upward bias of the effect of parent involvement, thereby making it appear to be disproportionately beneficial to children. In contrast, if parents of the most struggling children are more likely to be involved, a downward bias in the influence of parent involvement may emerge, indicating that parent involvement is less beneficial for children than is actually the case. Between-child analyses are susceptible to these sorts of endogeneity or selection biases (Duncan, Magnuson, & Ludwig, 2004). One approach for addressing these biases is conducting within-individual analyses linking changes in parent involvement to changes in academic or behavioral functioning (Allison, 1990).

The present study considers between- and within-child associations between parent involvement and children's development using two-level hierarchical learn models that were estimated using full information maximum likelihood techniques in HLM 6.06. Our analysis began with the estimation of unconditional growth models to establish appropriate model specifications for our conditional analytic models (Raudenbush & Bryk, 2002). Next, a series of conditional models were estimated to address the study's aims. Level-1 contained repeated measures of achievement scores and behavior ratings taken at first, third, and fifth grades, which were nested within individual children at Level-2. Parent involvement within each grade was specified as a Level-1, along with time-varying child, family, and classroom characteristics. The Level-1 model is shown in Equation 1:

$$Y_{it} = \pi_{0i} + \pi_{1i} \left( AGE_{it} - \bar{AGE}_{i..} \right) + \pi_{2i} \left( PINV_{it} - \bar{PINV}_{i.} \right) + \pi_{3i} \left( FAM_{it} - \bar{FAM}_{i.} \right) + \pi_{4i} \left( CLASS_{it} - \bar{CLASS}_{i..} \right) + \varepsilon_{it}. \quad (1)$$

Achievement and social skills for child  $i$  at time  $t$  were modeled as a function of time-varying measures of age ( $AGE_{it}$ ) and parent involvement ( $PINV_{it}$ ), as well as family ( $FAM_{it}$ ) and classroom ( $CLASS_{it}$ ) characteristics. All of the predictors at Level-1 were group-mean centered, also known as within-person centering (Raudenbush & Bryk, 2002; Singer & Willett, 2003). The intercept represents each individual's average level of achievement or social skills during middle childhood, while the coefficient on  $AGE_{it}$  represents growth in achievement or social skills per month increase in age from first through fifth grade. Coefficients on the Level-1 predictors represent within-child associations over time and test whether within-child changes in parent involvement promote changes in achievement and socioemotional development. Group-mean centering is an important technique for addressing bias due to unobserved heterogeneity or unmeasured factors that vary across individuals and have a consistent effect over time. However, that these predictors are still susceptible to time-varying omitted variable bias. Between-child associations between average parent involvement and children's average level and growth of academic and socioemotional functioning were considered at Level-2. Variability in the intercept and the linear growth terms in the Level-1 equations were modeled using Equations 2 and 3:

$$\begin{aligned} \pi_{0i} = & \beta_{00} + \beta_{01} \left( AvPINV_i - Av\bar{PINV}_{..} \right) \\ & + \beta_{02} \left( EFAM_i - E\bar{FAM}_{..} \right) \\ & + \beta_{03} \left( CHILD_i - CHILD_{..} \right) \\ & + \beta_{04} \left( AvFAM_i - Av\bar{FAM}_{..} \right) \\ & + \beta_{05} \left( AvCLASS_i - Av\bar{CLASS}_{..} \right) + r_{0it} \end{aligned} \quad (2)$$

$$\begin{aligned}
\pi_{1i} = & \beta_{10} + \beta_{11} \left( AvPINV_i - Av\bar{PINV} \right) \\
& + \beta_{12} \left( EFAM_i - EFAM \right) \\
& + \beta_{13} \left( CHILD_i - CHILD \right) \\
& + \beta_{14} \left( AvFAM_i - Av\bar{FAM} \right) \\
& + \beta_{15} \left( AvCLASS_i - Av\bar{CLASS} \right) + r_{1it}
\end{aligned} \tag{3}$$

Variation in mean levels of achievement and social skills ( $\pi_{0i}$ ) and in the growth of performance on these measures over time ( $\pi_{1i}$ ) was explained with individual-level averages from middle childhood for parent involvement ( $AvPINV_i$ ), family ( $AvFAM_i$ ) and classroom ( $AvCLASS_i$ ) characteristics. Time-invariant measures of early family and demographic ( $EFAM_i$ ) characteristics from birth through 54 months, as well as time-invariant child characteristics and 54 month scores on each of the child outcomes ( $CHILD_i$ ) were included as covariates. In the Level-2 equations, all predictors were grand-mean centered. These models capture both between- and within-child variation. The Level-1 coefficient on parent involvement examines whether within child changes in parent involvement are associated with improvements in academic and social development. The Level-2 coefficients on parent involvement consider whether children with parents who have higher average levels of involvement in school display better average levels of academic and social skills as well as greater improvement in these domains over time.

## Method

### Sample

Data for this study are drawn from the NICHD Study of Early Child Care and Youth Development (NICHD SECCYD), an ongoing longitudinal, multi-method study of 1364 children and their primary caregivers from 10 U.S. data collection sites (NICHD ECCRN, 1993). Sampling for the NICHD SEYCCD was conditionally random and excluded mothers younger than 18 years of age at the time of the participating child's birth, families not intending to remain within proximity of the data collection sites for at least three years, children with obvious disabilities at birth or who remained in the hospital more than seven days after birth, and mothers who would have significant problems conversing in English (NICHD ECCRN, 2004). The NICHD SECCYD contains a wide range of academic and socioemotional skills from observational and standardized assessments and parent- and teacher-reports, as well as parent- and teacher-reports of parent involvement in elementary school.

Data from birth (1991) to fifth grade were utilized in the present study. Although the initial sample was comprised of 1364 children, as described in past research, ethnic minority families with lower educational levels were less likely to remain in the study over time and 137 children were lost within the first phase (1-36 months) to selective attrition (Duncan & Gibson-Davis, 2006; NICHD ECCRN, 2003). By first grade, an additional 94 children withdrew from the study, resulting in 231 attrition cases. Independent samples t-tests and chi-square tests were conducted to examine whether the children and families in the attrition group ( $n = 231$ ) were systematically different from the remaining sample who continued to

participate during elementary school ( $n = 1133$ ). Results revealed few differences between these two groups. The retained and attrition samples did not significantly differ in maternal age, maternal cognitive ability, or child sex. However, the retained sample was comprised of fewer non-Hispanic Black children (11.6%;  $\chi^2 = 6.44, p < .05$ ) than the attrition sample (17.7%). Mothers in this sample had more years of education ( $M = 14.4$ ;  $\chi^2 = 55.08, p < .001$ ) and were more likely to have been married when their child was born (78.6%;  $\chi^2 = 349.97, p < .001$ ) than mothers in the attrition sample ( $M = 13.3$  and 66.7%, respectively). Income-to-needs ratios were significantly higher among families in the retained ( $M = 3.60$ ) than attrition samples ( $M = 2.94$ ;  $t = 2.76, p < .01$ ).

Traditional approaches to handling missing data, such as listwise deletion or mean imputation, have been criticized for biasing estimates, misrepresenting statistical power, and leading to invalid conclusions (Acock, 2005; Rubin, 1987; Widaman, 2006). Missing data patterns were carefully analyzed and Little's MCAR tests indicated that the missing data were not missing completely at random (MCAR;  $\chi^2 = 32458.01, p < .001$ ), which supported the use of missing data imputation (Little, 1988). Missing data were imputed using multiple imputations by chained equations (ICE), which was implemented in Stata 10 (Royston, 2005). Currently, there is disagreement in the literature about whether missing data on dependent variables should be imputed. Some argue that imputed values for dependent variables should be deleted post imputation (von Hippel, 2007), while others maintain that the nature of missing values for independent and dependent variables are fundamentally equal and should be treated accordingly (Allison, 2008; Schafer & Graham, 2002). In the present study, imputations were performed on independent and dependent variables and imputed dependent variables were retained after imputation. Multiple imputations were performed in Stata, and based on the relative efficiency calculation by Rubin (1987), five imputations were deemed sufficient for the level of missing data in our study, resulting in a final sample of 1364 children. The analyses for this study were performed using HLM 6.06 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2004). Following imputation, the five data sets were imported into HLM, which was then used to conduct separate analyses for each set of plausible values. Parameter estimates were averaged and standard errors were computed in HLM 6.06 using standard techniques described by Raudenbush et al. (2004).

## Measures and Procedures

### Parent Involvement

Information on parent involvement was obtained from parents and teachers in first, third and fifth grade using modified versions of the Parent-Teacher Involvement Questionnaire (Miller-Johnson, Maumary-Gremaud, & The Conduct Disorders Research Group, 1995). These questionnaires included items regarding the frequency and the quality of parents' involvement in children's educational progress in school and at home. A five point likert-type response scale was employed with responses ranging from (1) *not at all* to (5) *a great deal*. Our composite measures of parent involvement include items reflecting teachers' and parents' reports of parental encouragement of education (e.g., "How often does this parent volunteer or visit at school?"), parental investment (e.g., "How important is education in this family?") and educational attitudes (e.g., "How much do you feel this parent has the same goals for his/her child that the school does?"). Parent and teacher parent involvement composites were comprised of 12 items and 10 items, respectively, with higher scores indicating more parent involvement. In addition, the parent involvement composites were highly reliable within each first, third and fifth grade (parents' Cronbach's  $\alpha$ s = .85-.86; teachers' Cronbach's  $\alpha$ s = .89-.93). It is important to note that items selected to create the mother and teacher composites were identical for each reporter across the first, third and fifth grade years. Parents' and teachers' reports were both analyzed in separate models

rather than relying on a single reporter (see Table 1). Average levels of parent involvement were comparable across grades (see Table 1).

## Outcomes

**Academic achievement**—Academic achievement was assessed at 54 months (prior to Kindergarten entry), and first, third and fifth grades using three subtests from the Woodcock-Johnson Psycho-Educational Battery-Revised (WJ-R, Woodcock & Johnson, 1989, 1990), which was administered to participants in a laboratory setting. Early childhood scores were included as an additional preventative measure against omitted variable bias.

Picture Vocabulary tested comprehension, knowledge and receptive vocabulary, Letter-Word Identification assessed symbolic learning and reading skills, and Applied Problems tested mathematical skills. The scores used in the current study's analyses were W scores, a special transformation of the Rasch ability scale, which ease interpretation of performance and facilitate analyses of change over time. Generally high internal consistency estimates have been found in standardized samples (Woodcock & Johnson, 1989, 1990). Internal consistencies have been reported ranging from .70-.82 for the Picture Vocabulary test with test-retest reliabilities ranging from .63-0.78. Internal consistencies for Letter-Word Identification and Applied problems have been quite high, ranging from .94-.98 with test-retest reliabilities of .80-.87 (Woodcock & Johnson, 1989, 1990).

**Socioemotional development**—Socioemotional development was assessed during first, third and fifth grades using two standardized measures. Parents completed the Child Behavior Checklist (CBCL, Achenbach, 1991a) and teachers completed the Teacher Report Form (TRF), a slightly modified version of the CBCL, to measure children's social competence and behavior problems (Achenbach, 1991a). As with the achievement outcomes, early ratings from the 54-month time of social skills and problem behaviors were included in the between-child analyses when predicting later problem behaviors. Reporters rated how true the behaviors are to a child on a three point scale (0 = *Not True*; 1 = *Sometimes or Somewhat True*; 2 = *Very True or Often True*). Higher overall scores reflect more social or behavioral problems. In the present analyses, a total behavior problems standardized t-score, comprised of two subscale scores of externalizing and internalizing problems, was utilized. Externalizing problems include aggressive or delinquent behavior, and internalizing problems are comprised of withdrawn, anxious or depressed behaviors. The CBCL and TRF are widely accepted as reliable and internally consistent (Achenbach, 1991b). Parents' and teachers' reports of problem behaviors were highly reliable at each time point (Cronbach's  $\alpha$ s: parents' = .93-.95; teachers' = .95-.96).

In first, third and fifth grade, parents and teachers also completed the Social Skills Rating System (SSRS, Gresham & Elliott, 1990), which was comprised of two subscales examining children's social skills and academic competence. Parents also completed the SSRS at 54 months. This score was used to control for social skills prior to school entry in the between-child analyses. The current study focused solely on the social skills subscale which assesses cooperation, assertion and self-control. Cooperation includes behaviors such as paying attention to the teacher's instruction and putting away work materials properly. Assertion is comprised of initiating behaviors, such as starting conversations with peers and helping peers with classroom tasks. Self-Control includes behaviors that emerge in conflict situations, such as responding to teasing or peer pressure appropriately, receiving criticisms well, and controlling temper. Parents and teachers assessed the frequency of a social behavior on a three-point scale (0 = *Never*; 1 = *Sometimes*; 2 = *Very Often*). Additionally, the reporters rated how important the behavior is for classroom success, again on a three-point scale (0 = *Not Important*; 2 = *Important*; 3 = *Critical*). The scores from all three of

these subscales were summed to create a total SSRS score for each child. These scores were standardized with higher scores reflecting better social adjustment. The validity of the SSRS is well documented and the scale has also been found to be highly correlated with other well established measures of social functioning such as the CBCL (Achenbach, 1991a; Achenbach, 1991b; Gershman & Elliot, 1990). Parents' and teachers' reports of social skills were highly reliable at each time point (parents' Cronbach's  $\alpha$ s = .92-.94; teachers' Cronbach's  $\alpha$ s = .93-.94).

## Covariates

**Child characteristics**—A number of important background characteristics were included as covariates of child outcomes and parent involvement (see Table 1). Child demographic information was obtained from periodic parent interviews from the child's first month of life through fifth grade. At 1 month, mothers reported on child sex ( $0 = female, 1 = male$ ) and ethnicity (non-Hispanic White, Hispanic, non-Hispanic Black, and Other).

**Classroom characteristics**—Teacher-ratings were included to measure parent involvement, children's social skills and their behavior problems. Thus it was important to control for background characteristics of teachers, such as teaching experience as well as general teacher practices that may influence their ratings or children's academic or social progress throughout school. In the fall of each school year, first, third and fifth grade teachers reported on their years of teaching experience in a Teacher Questionnaire that was modified from the School Teacher Survey (National Center for Educational Statistics, 1994). Across elementary school, teachers had comparable levels of teaching experience (see Table 1).

Additionally, teacher practices were observed to measure the classroom environment as a control for classroom quality. Scores for positive emotional climate in the classroom were obtained from the qualitative rating portion of the Classroom Observation System (COS; NICHD ECCRN, 2002). This scale was chosen due to its consistent use across first, third and fifth grade. Ratings were obtained during two-hour classroom observations of which thirty-minutes were dedicated to qualitative ratings. These thirty minutes were divided into three ten-minute qualitative segments during which coders rated the teacher, the child and the classroom. Scores on the ratings used in the current study ranged from one to seven and represented a global impression of the overall enthusiasm, warmth and positive regard expressed by the teacher and students in the classroom. First, third and fifth grade ratings were entered in the Level-1 models and also averaged into a single covariate and included in the Level-2 models. Classroom quality scores were comparable across first ( $M = 5.32 SD = 1.29$ ), third ( $M = 5.05 SD = 0.78$ ), and fifth grade ( $M = 5.10 SD = 0.71$ ).

**Family characteristics**—Family demographic information was also obtained from parent interviews from the child's birth through fifth grade. These characteristics include maternal age, the number of years of education completed before the birth of the study child, and the number of children in the household in first, third and fifth grade. Mothers also reported on their marital status ( $0 = married, 1 = unmarried$ ) and hours of employment at first, third and fifth grades.

Income data were frequently collected from families participating in the NICHD SECCYD. Income-to-needs ratios were calculated by taking pre-tax household income for a given year and dividing it by the poverty threshold for a household, which takes into account the year the income was earned, the number of individuals in the home, and the number of children in the home. Income-to-needs ratios from first, third and fifth grade were used in estimating within-child effects of parent involvement on achievement and social skills. A composite



variable of the average income-to-needs ratio across the three grades was also used in estimating between-child effects of parent involvement on levels and changes in children's academic and social skills. An average early income-to-needs ratio composite was computed using income data from 6, 15, 24, 36 and 54 months as another covariate in the between-child analysis.

Maternal scores on the Peabody Picture Vocabulary Test-Revised (PPVT-R, Dunn & Dunn, 1981) from a laboratory assessment at the 36 month time point were used to assess maternal cognitive competence. Split-half correlations for reliability ranged from .80 to .83 in a standardization sample (Dunn & Dunn, 1981). Since maternal cognitive ability has the potential to influence child academic and socioemotional outcomes, and therefore confound associations between parent involvement and these outcomes, the PPVT-R was used as time-invariant covariate in the Level-2 models.

The Home Observation for Measure of the Environment (HOME; Caldwell and Bradley, 1984) was used to represent each child's early home environment. The HOME is a widely used assessment tool which integrates investigator observation and parental interview components to examine the physical environment, responsiveness, and academically stimulating characteristics of a home. Composite scores from age-specific versions of the HOME were obtained at 15, 36 and 54 months. These scores were transformed into z-scores and then averaged to create a single early childhood home environment composite.

## Results

Descriptive statistics regarding the sample and outcomes are listed in Table 1. Females comprised 52% of the current sample and 78% of the children were Non-Hispanic White. On average, mothers were in their late twenties ( $M = 28.11$ , ages ranged from 18-46) with some college education ( $M = 14.23$ , values ranged from 7-21 years) and most mothers reported being stably married between the first and fifth grades ( $M = 0.72$ , values ranged from 0 and 1). The mean income-to-needs ratio was generally high and increased during school.

As shown in Table 2, achievement scores improved significantly across elementary school from first to fifth grade between children, as well as parent SSRS and CBCL ratings. Teacher-ratings on the CBCL ( $M = 50.54$ , values ranged from 49.91- 51.43) and their ratings on the SSRS ( $M = 102.93$ , values ranged from 102.30-103.36) did not change significantly across grades. On average, parent involvement was rated comparably across grades for parent-reports ( $M = 4.56 - 4.63$ ). Teachers rated parent involvement the highest in the third grade ( $M = 3.74$  vs.  $4.22$  vs.  $3.55$ , respectively). Mean comparisons using simple t-tests revealed that parents rated parent involvement higher than teachers at each grade ( $p < .001$ ).

We began our analysis by estimating unconditional growth models, which revealed significant variability in the intercepts and slopes of the trajectories for our outcome variables (see Table 2). The only exception was that the age parameter for teachers' reports of social skills and behavior problems demonstrated low reliability and chi-square tests showed no variability in this parameter, so we fixed the linear growth terms in the Level-2 models predicting teachers' reports of social skills and behavior problems. Since all of the other outcomes demonstrated significant reliability of and variability on the age parameter, both their intercepts and linear growth terms were estimated as random effects at Level-2. As the slope terms suggest, children's reading, math, vocabulary skills, as well as their parent-rated social skills increased over time, while their problem behaviors declined.

## Predicting Academic Trajectories

**Within-child effects**—Tables 3 and 4 present results of the HLM analyses predicting achievement over time with mother- or teacher-reports of parent involvement. The first panel of Table 3 shows the coefficients from the Level-1 model, which assessed whether within-person changes in maternal-reports of parent involvement predicted within-child changes in reading, math and vocabulary scores during elementary school, controlling for changes in other child, family and school characteristics as well as between-person differences in all of these factors. Table 4 displays the same set of results for models using teacher-reports of parent involvement. Increases in parent involvement were largely unrelated to individual growth in academic skills, regardless of whether parents or teachers reported on parent involvement practices. One exception emerged for reading skills. Increases in teacher-reported parent involvement were related to declines in children's reading scores (see Table 4). More specifically, a standard deviation improvement in teacher-reported parent involvement was associated with a .03 standard deviation decline in reading skills. The only other variable which consistently, significantly predicted within-child changes in achievement was classroom quality. Increases in the emotional quality of a child's classroom were associated with small declines (ranging from .01 to .05 SD units) in each of the achievement domains.

**Between-child effects**—The second panel of Tables 3 shows results from the Level-2 models which consider between-child associations of average levels of parent involvement with average level of achievement (intercept) and achievement growth over time (slope). Parent-reported parent involvement, when averaged across elementary school, was not significantly associated with children's average reading, math and vocabulary achievement scores. Results also showed that there were no significant associations between average levels of parent-reported parent involvement and growth in achievement over time. The second panel of Table 4 shows a similar pattern emerged when teachers reported on parent involvement. Overall, few significant relations emerged between parent involvement and achievement; specifically, no between-child associations were detected and small within-child associations were evident only for reading skills when teachers reported on parent involvement.

In contrast, several child, family and classroom characteristics were linked to between-child differences in achievement, and similar patterns were revealed for both maternal and teacher-reports of parent involvement. Maternal cognitive competence was associated with higher average levels of reading, math and vocabulary. Male children had lower average achievement scores in math and vocabulary than females, but no gender differences were detected for reading. Earlier scores from the 54 month time point on each of the achievement tests were positively related to average level scores in elementary school. In regards to the growth of academic skills over time, children in less emotionally supportive classes experienced greater achievement gains over time.

## Predicting Social Skill Trajectories

**Within-child effects**—Table 5 presents results of the HLM analysis predicting children's social skills over time with maternal-reports of parent involvement. The first panel of Table 5 displays the coefficients from the Level-1 model, within-child changes in mother-reported parent involvement predicting within-child changes in parent- and teacher-reported social skills and problem behaviors during elementary school. Within-child increases in parent involvement across elementary school were related to improvements in teacher-reported social skills. A standard deviation increase in parent involvement was linked to a modest increase of .22 SD in teacher-reported social skills, and small reductions in problem behaviors over time: .12 SD in teacher-rated problem behaviors, and .08 SD mother-rated

problem behaviors. In contrast, within-child changes in maternal reports of parent involvement were not linked to changes in maternal reports of child social skills.

Table 6 presents results of the HLM analysis predicting social skills over time with teachers' reports of parent involvement. The first panel of Table 6 displays the coefficients from the Level-1 model. Within-child increases in teacher-reported parent involvement were related to .12 *SD* improvement in teacher-reported social skills and .08 of a standard deviation decrease in teacher-reported behavior problems. In contrast, enhancements in teacher-reported parent involvement were not associated with changes in maternal-reports of child social skills or behavior problems.

**Between-child effects**—The second panel of Table 5 shows results from the Level-2 model examining between-child associations of parent-reported parent involvement with average levels of social skills (intercept) and behavior problems as well as growth in social skills and behavior problem over time (slope). Higher average levels of maternal-reported parent involvement across elementary school were related to better social functioning across parent and teacher SSRS reports. When compared to children whose parents' involvement in school was at the sample average, children whose parents scored a standard deviation above average displayed social skills levels that were .09 and .15 of a standard deviation higher based on teacher and mother-reports, respectively. In contrast, higher levels of maternal-reported parent involvement were not significantly associated with maternal- or teacher-rated problem behaviors on the CBCL. In summary, between-individual differences in average parent involvement across elementary school predicted higher average social functioning but not problem behaviors problems. Finally, average levels of maternal-reported parent involvement did not predict growth in social skills and problem behaviors over time.

As with the achievement findings, several child, family and school characteristics were also linked to between-child differences in social skills and problem behaviors when parent involvement was reported by parents. Earlier ratings of social skills and problem behaviors from the 54 month time point were associated with average level scores in their corresponding subsequent ratings except for teacher-reported social skills. Higher classroom quality and teacher experience promoted higher average levels of teacher-rated social skills and were linked to lower average levels in the teacher- and maternal-rated problem behaviors.

The second panel of Table 6 show results from the Level-2 model examining between-child associations between teacher-reported parent involvement and trajectories of social skills and problem behaviors over time. Higher average levels of teacher-reported parent involvement were related to better social functioning and lower rates of behavior problems based on parent- and teacher-reports. When compared to children whose parents' involvement in school was at the sample average, children whose parents scored a standard deviation above average displayed social skills levels that were .43 and .21 of a standard deviation higher based on teacher and mother-reports, respectively. Higher levels of teacher-reported parent involvement were also associated with fewer teacher-reported behaviors problems in children. Specifically, children whose parents scored a standard deviation above average displayed problem behaviors that were lower by .36 a standard deviation higher based on teacher-reports. In sum, between-individual differences in average parent involvement across elementary school predicted higher social functioning and lower teacher-reported behavior problems on average from 1<sup>st</sup> through 5<sup>th</sup> grade. Finally, average levels of teacher-reported parent involvement did not predict growth in social skills and problem behaviors over time.

As in the maternal-report models, several child, family and school characteristics were also linked to between-child differences in social skills and problem behaviors. Earlier ratings of social skills and problem behaviors from the 54 month time point were associated with average level scores in their corresponding subsequent ratings except for teacher-reported SSRS ratings. The number of minors in a household was positively linked with average levels of teacher-rated social skills and negatively related to maternal reports of behavior problems. Higher classroom quality was positively related to teacher-rated social skills and negatively related to both maternal and teacher-reported behavior problems. More teacher experience was related to higher average teacher-rated social skills and lower average levels of teacher-rated problem behaviors.

## Discussion

The purpose of this study was to consider the benefits of parent involvement for academic and social development in elementary school. In doing so, we aimed to address the current literature's reliance on cross-sectional designs and draw attention to these processes during middle childhood, which has been previously understudied. The results of the between-child analyses suggested that higher parent involvement, as reported by mothers and teachers, promotes better social skills, fewer problem behaviors, and is unrelated to average achievement across elementary school. However, between-child variation in the average levels of parent involvement was generally not predictive of growth in achievement and socioemotional functioning across elementary school. The exception was a finding that increases in average levels of teacher-reported parent involvement are related to less growth in reading scores. Our within-child analyses linked increases in maternal-rated parent involvement to improved teacher-rated social skills and declines in maternal- and teacher-rated problem behaviors. Increases in teacher-rated parent involvement were also related to enhancements in teacher rated social skills and declines in problem behaviors. In contrast, within-child growth in achievement was not related to changes in either measure of parent involvement.

### Achievement and Parent Involvement

Overall, the between- and within-child analyses of parent involvement and achievement revealed consistent findings. Greater engagement in a variety of parent involvement practices was largely unrelated to academic achievement, and improvements in parent involvement did not predict gains in any of the standardized achievement measures, except one possibly spurious finding between changes in teacher-reported parent involvement and decreased reading growth. Other past work has not detected significant associations between parent involvement and achievement (e.g., Keith et. al, 1986; Okpala, Okpala, & Smith, 2001; Reynolds, 1992; White, Taylor and Moss, 1992). Past findings of positive between-child associations of parent involvement and achievement may be artifacts of selection bias, whereby involved parents differed from less involved parents in a variety of ways such as in their motivation and beliefs about parenting, education, and their children's development.

Another potential explanation for this lack of association concerns the breadth of our measure of parent involvement. The current study used a measure containing widely accepted dimensions of parent involvement, such as the value parents place on education and the frequency with which they visit their child's school. However, Sheldon and Epstein (2005) suggest that parental involvement is most efficacious when it is subject specific, such that parents need to be involved within whichever domain they are targeting for improvement. Likewise, in past experimental work that linked significant increases in parent involvement with growth in literacy skills, the targeted parent involvement strategies focused specifically on promoting reading skills such as learning sight words and letter-sound recognition (DeCusati & Johnson, 2004). A recent meta-analysis found that parental

expectations and aspirations were the factors most highly related to achievement (Fan & Chen, 2001). In the current study, parents were surveyed about their feelings and thoughts about education, but these items may have been too general or few in number to sensitively detect change in children's achievement. Another possibility is that parent involvement is more globally beneficial for children's academic performance in school (e.g., average grades, homework completion) but does not specifically promote achievement in any particular domain. Fan and Chen (2001) examined 25 studies of parent involvement and academic achievement and found that average correlations between parent involvement and children's grades or GPA, both global indicators of school performance, tended to be moderate in size ( $r = .33$ ), but average correlations between involvement and math and reading achievement scores were much lower ( $r = .18$ ).

It should be noted that the only other study of within-child associations between parent involvement and student achievement, by Dearing and colleagues (2006) demonstrated a significant association between improvements in parent involvement across elementary school and improvements in literacy skills during elementary school. However, there are some notable differences in this study and ours. Dearing and colleagues had a much smaller ( $N = 281$  vs.  $N = 1364$ ) and more socioeconomically homogenous sample, consisting only of low-income children enrolled in an intervention program. Children from low-income families face a higher likelihood of confronting multiple developmental risk factors across contexts than their more affluent counterparts (Friedman & Chase-Landsdale, 2002); thus, a positive factor, like parent involvement, may be especially protective. Moreover, Dearing and colleagues used parental-reports that indicated whether or not they ever participated in certain school-based activities, whereas the current study included more detailed parent and teacher perspectives of parent involvement. Therefore, differences in the present study and the Dearing et al. (2006) study may be attributable to sample and measurement characteristics.

Additionally, the within-child negative finding in the current study among teacher-reports of parent involvement and reading skills, although a weak association, is also supported by past work that has uncovered negative associations among facets of parent involvement and achievement outcomes (Milne, et al., 1986; Sui-Chu & Willms, 1996). These researchers argued that parents may become increasingly involved in an effort to be proactive when their children experience academic difficulties. In the early years of elementary school, parents may tend to become more involved when their children are struggling in reading, but not math, because teachers focus substantially more on reading in first and third grades (Pianta, Belsky, Houts, Morrison, & NICHD ECCRN, 2007). This negative association for reading growth, unlike math, may reflect teachers' attempts to elicit more parental involvement among parents of struggling readers during elementary school when classroom instruction heavily targets literacy skills. Finally, the current study unexpectedly revealed small, negative associations between classroom quality and achievement in both the within- and between- child analyses. Pianta et al. (2008) also uncovered mixed findings between emotional climate and achievement, with the measure of emotional quality showing negative associations with literacy and math in first grade and more positive associations as elementary school progressed. Quality, which was characterized as positive emotional climate in the current study, was found to be consistently predictive of fewer problem behaviors and higher social skills between children.

### **Social Development and Parent Involvement**

Contrary to the achievement findings, significant associations were detected repeatedly among parent involvement, social skills, and behavior problems in both between- and within-child models. In fact, increases in parents' involvement over time were related to concomitant increases in children's social skills and declines in problem behaviors for both

reporters of involvement. Not only do the current findings extend past cross-sectional associations between parent involvement and socioemotional functioning, but these improvements in socioemotional skills may hold longer-term implications for future academic performance and behavior (Bub, McCartney, & Willett, 2007; Li-Grining, Votruba-Drzal, & Maldonado-Carreño, under review). Additionally, these associations in the within-child models suggest that the relation between parent involvement and social skills is not merely the product of selection bias. Instead, these findings may reflect a growing consistency in social expectations across settings as children progress through school. As parents become more involved with their children's education, they may be more likely to communicate with school personnel about their child's adjustment and behavior in class. In turn, parents may become more informed about their children's social difficulties from teachers and school staff, and then subsequently address and reinforce more positive behaviors at home. Although communication among parents and teachers would be expected to benefit academic development as well, it is possible that teachers and parents discuss social and behavioral issues more frequently than academic concerns.

### Limitations and Future Work

Although the present study offers many advantages with its longitudinal design and multi-method measurements, several limitations should be noted. Future studies of parent involvement could include more assessments or experimental designs to address issues of causality. The current analytic techniques limit the ability to make causal inferences, even when rigorous statistical techniques are employed. Moreover, early childhood interventions often include parent involvement as a key program component, such as the Infant Health and Development Program (McCormick, McCarton, Brooks-Gunn, Belt, & Gross, 1998), Head Start (Administration for Children and Families, 2007), and the School Development Program (Haynes, Comer & Hamilton-Lee, 1988). However, with so many program features, it is difficult to distinguish the unique contribution of parent involvement to these gains. Future studies should more directly focus on parent involvement efforts to reduce potential confounding variables from additional experimental or intervention factors. Additionally, future parent involvement researchers should try to collect extensive and comprehensive data on a variety of the practices considered to be parent involvement. Instruments that survey a wide range of parent involvement practices may mask the parent behaviors that support growth in children's academic and social competence.

Results from the current study suggest that both maternal- and teacher-reported parent involvement have predictive value for children's social development. Although the patterns in associations across reporters were remarkably similar, there were several instances in which either parent or teacher-reports predicted an outcome that the other report did not. Such findings lend support to the practice of triangulation in collecting parent involvement data.

Finally, findings from the current study are limited in their generalizability. The NICHD ECCRN and Duncan (2003) assert that although attrition and non-random selection in the NICHD SECCYD sample inhibit the application of findings to broader populations, the sample also embodies unique strengths. Such strengths include the breadth of economic, ethnic, and geographic diversity embedded in the NICHD SECCYD sample.

### Conclusion

Overall, the present findings suggest that parents continue to wield considerable influence on children's development as children progress through school. It is important for future work to explore parent behaviors that support children's achievement. In addition, further exploration of how parents and teachers may be jointly responding to children's social and

behavioral skills could help to elucidate the potential benefits of parent involvement for social development. Investigation of the possible selection factors that motivate parent involvement would also be useful to inform policies and interventions.

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## References

- Achenbach, TM. Manual for the Child Behavior Checklist/4-18 and Profile. University of Vermont, Department of Psychiatry; Burlington, VT: 1991a.
- Achenbach, TM. Manual for the Teacher Report Form and Profile. University of Vermont, Department of Psychiatry; Burlington, VT: 1991b.
- Acock AC. Working with missing values. *Journal of Marriage and Family*. 2005; 67:1012–1028.
- Administration for Children and Families. Office of Head Start. 2007 [January 29, 2008]. from <http://www.acf.hhs.gov/programs/hsb/>
- Allison, PD. Change scores as dependent variables in regression analysis.. In: Clogg, CC., editor. *Sociological Methodology*. Basil Blackwell; Oxford, England: 1990. p. 93-114.
- Allison, PD. Missing data. A presentation for Statistical Horizons workshop series; Chicago, IL: September 8-9. 2008
- Berger EH. Parent involvement: Yesterday and today. *The Elementary School Journal*. 1991; 91:209–219.
- Bronfenbrenner U, Ceci SJ. Nature-nurture reconceptualized in developmental perspective: a Bioecological Model. *Psychological Review*. 1994; 101(4):568–586. [PubMed: 7984707]
- Bub KL, McCartney K, Willett JB. Behavior problem trajectories and first-grade cognitive ability and achievement skills : A latent growth curve analysis. *Journal of Educational Psychology*. 2007; 99:653–670.
- Caldwell BM, Bradley RH. The HOME inventory and family demographics. *Developmental Psychology*. 1984; 20:315–320.
- Catsambis S. Expanding knowledge of parental involvement in children's secondary education: Connections with high school seniors' academic success. *Social Psychology and Education*. 2001; 5:149–177.
- Dearing E, Kreider H, Simpkins S, Weiss HB. Family involvement in school and low-income children's literacy: Longitudinal associations between and within families. *Journal of Educational Psychology*. 2006; 98(4):653–664.
- Dearing E, McCartney K, Weiss HB, Kreider H, Simpkins S. The promotive effects of family education for low-income children's literacy. *Journal of School Psychology*. 2004; 42:445–460.
- DeCusati CLP, Johnson JE. Parents as classroom volunteers and kindergarten students' emergent reading skills. *The Journal of Educational Research*. 2004; 97:235–246.
- Duch H. Redefining parent involvement in Head Start: A two-generation approach. *Early Child Development and Care*. 2005; 175:23–35.
- Duncan GJ, Magnuson KA, Ludwig J. The endogeneity problem in developmental studies. *Research in Human Development*. 2004; 1&2:59–80.

- Duncan GJ, Gibson-Davis CM. Connecting childcare quality to child outcomes: Drawing policy lessons from nonexperimental data. *Evaluation Review*. 2006; 30:611–630. [PubMed: 16966678]
- Dunn, LM.; Dunn, LM. Peabody Picture Test-Revised Manual for Forms L and M. American Guidance Service; Circle Pines, MN: 1981.
- Englund MM, Luckner AE, Whaley GJL, Egeland B. Children's achievement in early elementary school: Longitudinal effects of parental involvement, expectations, and quality of assistance. *Journal of Educational Psychology*. 2004; 96:723–730. 4.
- Fan X, Chen M. Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review*. 2001; 13:1–22.
- Fantuzzo J, McWayne C, Perry MA. Multiple dimensions of family involvement and their relations to behavioral and learning competencies for urban, low-income children. *School Psychology Review*. 2004; 33:467–480.
- Friedman, RJ.; Chase-Lansdale, PL. Chronic adversities.. In: Rutter, M.; Taylor, E., editors. *Child and Adolescent Psychiatry*. 4th ed.. Blackwell Science; Oxford: 2002. p. 261-276.
- Gresham, FM.; Elliott, SN. The Social Skills Rating System. A American Guidance Service; Circle Pines, MN: 1990.
- Gonzalez-DeHass AR, Willems PP, Holbein MFD. Examining the relationship between parental involvement and student motivation. *Educational Psychology Review*. 2005; 17:99–123.
- Haynes NM, Comer JP, Hamilton-Lee M. The school development program: A model for school improvement. *The Journal of Negro Education*. 1988; 57:11–21.
- Herrold, K.; O'Donnell, KO. Parent and family involvement in education, 2006-07 school year, from the National Household Education Surveys Program of 2007. Institute of Education Sciences: National Center for Education Statistics. 2008 [September 21, 2008]. from <http://nces.ed.gov/pubs2008/2008050.pdf>
- Hill NE, Castellino DR, Lansford JE, Nowlin P, Dodge KA, Bates JE, Pettit GS. Parent academic involvement as related to school behavior, achievement, and aspirations: Demographic variations across adolescence. *Child Development*. 2004; 75:1491–1509. [PubMed: 15369527]
- Izzo CV, Weissberg RP, Kasprow WJ, Fendrich M. A longitudinal assessment of teacher perceptions of parent involvement in children's education and school performance. *American Journal of Community Psychology*. 1999; 27:817–839. [PubMed: 10723536]
- Keith TZ, Reimers TM, Fehrmann PG, Pottebaum SM, Aubey LW. Parental involvement, homework, and TV times: Direct and indirect effects on high school achievement. *Journal of Educational Psychology*. 1986; 78:373–380.
- Little RJ. A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*. 1988; 83:1198–1202.
- Machen SM, Wilson JD, Notar CE. Parental involvement in the classroom. *Journal of Instructional Psychology*. 2004; 32:13–16.
- Milne AM, Myers DE, Rosenthal AS, Ginsburg A. Single parents, working mothers, and the educational achievement of school children. *Sociology of Education*. 1986; 59:125–39.
- McCormick MC, McCarton C, Brooks-Gunn J, Belt P, Gross RT. The Infant Health and Development Program: Interim summary. *Journal of Developmental & Behavioral Pediatrics*. 1998; 19:359–370. [PubMed: 9809269]
- McWayne C, Hampton V, Fantuzzo J, Cohen HL, Sekino Y. A multivariate examination of parent involvement and the social and academic competencies of urban kindergarten children. *Psychology in the Schools*. 2004; 41:363–377.
- Miedel WT, Reynolds AJ. Parent involvement in early intervention for disadvantaged children: Does it matter? *Journal of School Psychology*. 1999; 37:379–402.
- Miller-Johnson, S.; Maumary-Gremaud, A.; The Conduct Disorders Research Group. Parent-Teacher Involvement Questionnaire: Teacher Version. Duke University; Durham, NC: 1995.
- National Center for Educational Statistics. School Teacher Survey. 1994.
- National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network. The NICHD study of early child care: A comprehensive longitudinal study of young children's lives. 1993. (ERIC Document Reproduction Service No. ED3530870).



- NICHD Early Child Care Research Network. The relation of global first grade classroom environment to structural classroom features and teacher and student behaviors. *The Elementary School Journal*. 2002; 102:367–387.
- NICHD Early Child Care Research Network. Social functioning in first grade: Associations with earlier home and child care predictors and with current classroom experiences. *Child Development*. 2003; 74:1639–1662. [PubMed: 14669887]
- NICHD Early Child Care Research Network. Does class size in first grade relate to children's academic and social performance or observed classroom processes? *Developmental Psychology*. 2004; 40(5):651–664. [PubMed: 15355156]
- NICHD Early Child Care Research Network. Duncan GJ. Modeling the impact of child care quality on children's preschool cognitive development. *Child Development*. 2003; 74:1454–1475. [PubMed: 14552408]
- Okpala CO, Okpala AO, Smith FE. Parental involvement, instructional expenditures, family socioeconomic attributes and student achievement. *Journal of Educational Research*. 2001; 95:110–115. 2.
- Pianta R, Belsky J, Houts R, Morrison F, the NICHD ECCRN. Opportunities to Learn in America's Elementary Classrooms. *Science*. 2007; 315(5820)
- Pianta R, Belsky J, Vandergrift N, Houts R, Morrison F, the NICHD ECCRN. Classroom Effects on Children's Achievement Trajectories in Elementary School. *American Educational Research Journal*. 2008; 45(2)
- Raudenbush, SW.; Bryk, AS. 2nd ed.. Sage; Thousand Oaks, CA: 2002. Hierarchical linear models: Applications and data analysis methods.
- Raudenbush, SW.; Bryk, A.; Cheong, YF.; Congdon, R.; du Toit, M. HLM 6: Hierarchical linear and nonlinear modeling. Scientific Software International; Lincolnwood, IL: 2004.
- Reynolds AJ. A structural model of first-grade outcomes for an urban, low socioeconomic status, minority population. *Journal of Educational Psychology*. 1989; 81:594–603.
- Reynolds AJ. Comparing measures of parental involvement and their effects if a academic achievement. *Early Childhood Research Quarterly*. 1992; 7:441–462.
- Rimm-Kaufman SE, Pianta RC, Cox MJ, Bradley RH. Teacher-rated family involvement and children's social and academic outcomes in kindergarten. *Early Education and Development*. 2003; 14:179–198.
- Royston P. Multiple imputation of missing values: Update of ice. *Stata Journal*. 2005; 5:527–536.
- Rubin, DB. Multiple imputation for nonresponse in surveys. John Wiley & Sons; New York: 1987.
- Schafer JL, Graham JW. Missing data: our view of the state of the art. *Psychological Methods*. 2002; 7:147–177. [PubMed: 12090408]
- Sheldon SB, Epstein JL. Involvement counts: Family and community partnerships and mathematics achievement. *Journal of Educational Research*. 2005; 98:196–206.
- Sui-Chu EH, Willms JD. Effects of parental involvement on eighth-grade achievement. *Sociology of Education*. 1996; 69:126–141.
- Supplee LH, Shaw D, Hailstones K, Hartman K. Family and child influences on early academic and emotion regulatory behaviors. *Journal of School Psychology*. 2004; 42:221–242.
- von Hippel PT. Regression with missing Ys: An improved strategy for analyzing multiple imputed data. *Sociological Methodology*. 2007; 37(83-117)
- White KR, Taylor MJ, Moss VD. Does research support claims about the benefits of involving parent in early intervention programs? *Review of Educational Research*. 1992; 62:91–125.
- Widaman KF. Missing data: What to do with or without them. *Monographs of the Society for Research in Child Development*. 2006; 71:42–64.
- Woodcock, RW.; Johnson, MB. Woodcock-Johnson Psycho-Educational Battery – Revised. Riverside Publishing; Itasca, IL: 1989, 1990.

Table 1

## Descriptive Statistics

	Early Childhood Composites <sup>a</sup>		First Grade		Third Grade		Fifth Grade	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Maternal Report of Parent Involvement			4.63	0.50	4.62	0.41	4.56	0.49
Teacher Report of Parent Involvement			3.73	0.90	4.22	0.64	3.55	0.92
Income-to-needs ratio	3.48	2.86	3.76	3.00	4.22	3.67	4.38	3.94
Children in the household			2.38	0.95	2.41	0.98	2.48	1.04
Mother married			0.69		0.73		0.73	
Maternal employment	23.04	19.13	26.50	19.09	26.84	19.11	27.67	19.03
Teacher experience			12.21	10.77	11.87	10.55	14.50	9.46
Classroom quality			5.32	1.29	5.05	0.78	5.10	0.71
Teacher-reported SSRS			103.14	13.67	102.30	14.51	103.36	14.31
Teacher-reported CBCL			49.91	9.43	51.43	9.71	50.29	9.75
Mother reported SSRS	98.32	13.59	105.07	15.07	105.98	15.95	107.38	15.07
Mother reported CBCL	51.11	9.54	48.52	9.97	47.69	10.40	46.37	10.74
Math	423.87	19.46	469.42	15.67	497.16	12.63	509.77	12.29
Reading	368.70	21.39	452.05	24.06	493.39	18.27	509.88	17.38
Vocabulary	459.21	13.71	483.42	12.28	496.50	11.42	505.52	11.90
Child Male	0.48							
Child Black	0.13							
Child Hispanic	0.06							
Child other ethnicity	0.05							
Maternal Age	28.11	5.63						
Maternal Education	14.23	2.51						
Maternal PPVT score	98.11	18.60						
Average HOME scores	-0.04	0.87						
<b>Middle Childhood Average Family Variables<sup>b</sup></b>								
Mother married	0.72							
Maternal employment	27.00	16.44						
Income-to-needs ratio	4.12	3.35						

	Early Childhood Composites <sup>a</sup>	First Grade	Third Grade	Fifth Grade
Children in the household	2.42	0.94		
Teacher experience	12.86	6.44		
Classroom quality	34.43	3.07		

Note. N= 1364

<sup>a</sup>Data treated as time-invariant

<sup>b</sup>Data averaged across 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> grade

**Table 2**  
Unconditional Growth Models for Achievement and Social Skills across Elementary School

	Individual Growth Curve Parameters			Individual Growth Curve Variance Components		
	Average score <sup>d</sup> (SE)	Age <sup>b</sup> (SE)	Residual Variance	Intercept Variance (df = 1363)	Slope Variance (df = 1363)	Slope Variance (df = 1363)
Reading	485.02*** (0.57)	1.20*** (0.01)	152.59	293.88***		0.02
Math	492.09*** (0.38)	0.84*** (0.01)	72.15	125.17***		0.00
Vocabulary	495.17*** (0.30)	0.46*** (0.01)	33.33	104.00***		0.01***
Teacher-report SSRS <sup>c</sup>	102.93*** (0.35)	0.01 (0.01)	124.25	76.60***		
Mother-report SSRS	106.14*** (0.39)	-0.05*** (0.01)	63.41	166.86***		0.02***
Teacher-report CBCL <sup>c</sup>	50.54*** (0.22)	0.01 (0.01)	53.92	39.21***		
Mother-report CBCL	47.53*** (0.27)	-0.04*** (0.00)	25.25	79.81***		0.01***

Note. Significance levels denoted on the intercept and slope variance components reflect whether there were significant individual differences across individual intercepts and slopes.

<sup>a</sup>Intercept

<sup>b</sup>Slope, rate of change across 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> grade.

<sup>c</sup>Non-random Level-1 coefficient

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*p* < .001.

**Table 3**  
Multilevel Growth Models of Maternal Reports of Parent Involvement Predicting Achievement

	Reading <sup>d</sup>			Math <sup>d</sup>			Vocab <sup>d</sup>		
	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	
<b>Level-1</b>									
<i>Parent involvement</i>	-	-0.48 (0.75)	-	-0.05 (0.73)	-	-	-	0.35 (0.48)	
Income-to needs ratio	-	-0.14 (0.15)	-	0.08 (0.13)	-	-	-	0.07 (0.11)	
Children in the household	-	-0.34 (0.83)	-	-0.21 (0.64)	-	-	-	0.70 (0.45)	
Maternal marital status	-	-0.82 (1.19)	-	-0.48 (1.17)	-	-	-	-0.16 (0.81)	
Hrs of maternal employment	-	0.01 (0.02)	-	-0.02 (0.02)	-	-	-	-0.00 (0.02)	
Teacher experience	-	0.00 (0.02)	-	-0.01 (0.02)	-	-	-	0.03* (0.01)	
Classroom quality	-	-0.92*** (0.04)	-	-0.52*** (0.03)	-	-	-	-0.13*** (0.02)	
<b>Level-2</b>									
Intercept	485.10*** (0.47)	1.11*** (0.01)	492.12*** (0.30)	0.79*** (0.01)	495.15*** (0.20)	0.44*** (0.01)			
<i>Average Parent Involvement</i> <sup>a</sup>	-0.34 (1.57)	0.04 (0.05)	-1.13 (1.00)	0.01 (0.03)	0.15 (0.77)	-0.01 (0.03)			
<b>Early Childhood Family Variables</b>									
Child Male	-0.06 (0.94)	-0.04 (0.03)	-3.06*** (0.53)	0.05** (0.01)	-1.19* (0.51)	0.03** (0.01)			
Child Black	-3.33 (1.84)	-0.02 (0.05)	-1.89 (1.00)	-0.01 (0.03)	-0.79 (0.80)	-0.04* (0.02)			
Child Hispanic	2.33 (1.87)	0.06 (0.06)	-0.27 (1.07)	0.06 (0.03)	1.76* (0.79)	-0.00 (0.03)			
Child other ethnicity	-1.76 (2.22)	0.05 (0.06)	1.03 (1.34)	0.06 (0.04)	3.16** (1.05)	-0.03 (0.03)			
Maternal Age	-0.03 (0.12)	0.00 (0.00)	0.04 (0.06)	-0.00 (0.00)	-0.04 (0.05)	-0.00 (0.00)			
Maternal Education	0.23 (0.24)	-0.00 (0.01)	0.20 (0.18)	-0.00 (0.00)	0.21 (0.15)	0.00 (0.00)			
PPVT score <sup>b</sup>	0.15** (0.04)	0.00 (0.00)	0.05* (0.02)	0.00 (0.00)	0.15*** (0.02)	0.00 (0.00)			
Average early income-to-needs <sup>c</sup>	-0.17 (0.24)	0.01 (0.01)	0.09 (0.15)	0.00 (0.00)	0.15 (0.15)	0.00 (0.01)			
Average HOME scores <sup>d</sup>	1.20 (0.86)	0.03 (0.03)	1.06* (0.49)	0.02 (0.02)	1.02 (0.48)	-0.01 (0.01)			
<i>Early Achievement Score</i> <sup>e</sup>	0.40*** (0.02)	-0.01*** (0.00)	0.34*** (0.02)	-0.00*** (0.00)	0.38*** (0.02)	-0.00*** (0.00)			
<b>Middle Childhood Family Variables</b> <sup>a</sup>									
Average Marital status	2.39* (1.17)	-0.05 (0.04)	0.80 (0.75)	0.04 (0.03)	0.39 (0.76)	-0.00 (0.02)			

	Reading <sup>d</sup>			Math <sup>d</sup>			Vocab <sup>d</sup>		
	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	
Average Maternal Employment	0.02 (0.03)	-0.00 (0.00)	0.01 (0.02)	0.00 (0.00)	-0.00 (0.02)	0.00 (0.00)	-0.00 (0.02)	0.00 (0.00)	
Average childhood income	0.19 (0.25)	-0.00 (0.01)	0.17 (0.16)	-0.00 (0.00)	-0.16 (0.13)	-0.00 (0.00)	-0.16 (0.13)	-0.00 (0.00)	
Average children in home	-0.45 (0.62)	-0.01 (0.02)	-0.17 (0.33)	.01 (0.01)	-0.88** (0.27)	-0.01 (0.01)	-0.88** (0.27)	-0.01 (0.01)	
<b>Classroom Variables<sup>a</sup></b>									
Average teacher experience	0.01 (0.06)	0.00 (0.00)	0.02 (0.04)	0.00 (0.00)	0.03 (0.03)	0.00 (0.00)	0.03 (0.03)	0.00 (0.00)	
Average classroom quality	-0.07 (0.16)	-0.02*** (0.00)	-0.01 (0.11)	-0.01*** (0.00)	0.08 (0.09)	-0.01*** (0.00)	0.08 (0.09)	-0.01* (0.00)	

Note.  $N = 1364$

<sup>a</sup>Data from 1<sup>st</sup>, 3<sup>rd</sup>, and 5<sup>th</sup>

<sup>b</sup>Data from 36 months of age

<sup>c</sup>Data from 6-54 months of age

<sup>d</sup>Data from 15-54 months of age

<sup>e</sup>Data from 54 months of age

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

**Table 4**  
Multilevel Growth Models of Teacher-reports of Parent Involvement Predicting Achievement

	Reading <sup>d</sup>			Math <sup>d</sup>			Vocab <sup>d</sup>		
	Intercept (SE)	Slope (SE)		Intercept (SE)	Slope (SE)		Intercept (SE)	Slope (SE)	
<b>Level-1</b>									
<i>Parent involvement</i>	-	-0.75* (0.32)	-	-	-0.39 (0.28)	-	-	-0.64 (0.30)	
Income-to needs ratio	-	-0.14 (0.15)	-	-	0.07 (0.13)	-	-	0.06 (0.11)	
Children in the household	-	-0.31 (0.81)	-	-	-0.20 (0.63)	-	-	0.73 (0.45)	
Maternal marital status	-	-0.75 (1.20)	-	-	-0.49 (1.19)	-	-	-0.17 (0.83)	
Hours of maternal employment	-	0.01 (0.02)	-	-	-0.02 (0.02)	-	-	-0.00 (0.02)	
Teacher experience	-	0.00 (0.02)	-	-	-0.01 (0.02)	-	-	0.03* (0.01)	
Classroom quality	-	-0.91*** (0.04)	-	-	-0.52*** (0.03)	-	-	-0.13*** (0.02)	
<b>Level-2</b>									
Intercept	485.10*** (0.46)	1.10*** (0.01)	492.12*** (0.30)	0.78*** (0.01)	495.15*** (0.20)	0.43*** (0.01)			
<b>Average Parent Involvement<sup>a</sup></b>									
Child Male	-0.02 (0.95)	-0.04 (0.03)	-0.30*** (0.52)	0.05** (0.01)	-1.18* (0.51)	0.04** (0.01)			
Child Black	-3.53 (1.91)	-0.02 (0.05)	-1.98* (0.99)	-0.01 (0.03)	-0.85 (0.79)	-0.04* (0.02)			
Child Hispanic	2.42 (1.87)	0.06 (0.06)	-0.15 (1.08)	0.06 (0.03)	1.76* (0.80)	0.00 (0.03)			
Child other ethnicity	-1.57 (2.21)	0.05 (0.05)	1.16 (1.32)	0.06 (0.04)	3.19*** (1.05)	-0.02 (0.03)			
Maternal Age	-0.05 (0.12)	0.00 (0.00)	0.03 (0.06)	-0.00 (0.00)	-0.04 (0.05)	-0.00 (0.00)			
Maternal Education	0.19 (0.24)	-0.00 (0.01)	0.18 (0.18)	-0.00 (0.00)	0.20 (0.14)	0.00 (0.00)			
PPVT score <sup>b</sup>	0.15** (0.04)	0.00 (0.00)	0.05* (0.02)	0.00 (0.00)	0.15*** (0.02)	0.00* (0.00)			
Avg. early income-to-needs <sup>c</sup>	-0.20 (0.24)	0.01 (0.01)	0.07 (0.15)	0.00 (0.00)	0.14 (0.15)	0.00 (0.01)			
Average HOME scores <sup>d</sup>	0.69 (1.00)	0.04 (0.03)	0.70 (0.55)	0.02 (0.02)	0.93 (0.54)	-0.01 (0.01)			
<b>Early Achievement Score<sup>e</sup></b>	0.40*** (0.02)	-0.01*** (0.00)	0.34*** (0.02)	-0.00*** (0.00)	0.38*** (0.02)	-0.00*** (0.00)			
<b>Middle Childhood Family Variables<sup>a</sup></b>									
Average Marital status	1.98 (1.18)	-0.04 (0.04)	0.54 (0.75)	0.04 (0.03)	0.31 (0.74)	-0.01 (0.02)			

	Reading <sup>d</sup>			Math <sup>d</sup>			Vocab <sup>d</sup>		
	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	
Avg. Maternal Employment	0.04 (0.03)	-0.00 (0.00)	0.02 (0.02)	0.00 (0.00)	-0.00 (0.02)	0.00 (0.00)	-0.00 (0.02)	0.00 (0.00)	
Average childhood income	0.19 (0.24)	-0.00 (0.01)	0.17 (0.16)	-0.00 (0.00)	-0.15 (0.13)	-0.00 (0.00)	-0.15 (0.13)	-0.00 (0.00)	
Average children in home	-0.36 (0.62)	-0.01 (0.02)	-0.13 (0.32)	0.01 (0.01)	-0.86** (0.26)	-0.01 (0.01)	-0.86** (0.26)	-0.01 (0.01)	
<b>Classroom Variables<sup>a</sup></b>									
Average teacher experience	0.01 (0.06)	0.00 (0.00)	0.02 (0.04)	0.00 (0.00)	0.02 (0.03)	0.00 (0.00)	0.02 (0.03)	0.00 (0.00)	
Avg. classroom quality	-0.07 (0.17)	-0.02** (0.01)	-0.02 (0.11)	-0.01*** (0.00)	0.08 (0.09)	-0.01*** (0.00)	0.08 (0.09)	-0.01* (0.00)	

Note. N = 1364

<sup>a</sup>Data from 1<sup>st</sup>, 3<sup>rd</sup>, and 5<sup>th</sup>

<sup>b</sup>Data from 36 months of age

<sup>c</sup>Data from 6-54 months of age

<sup>d</sup>Data from 15-54 months of age

<sup>e</sup>Data from 54 months of age

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .



**Table 5**  
Multilevel Growth Models of Maternal Reports of Parent Involvement Predicting Social Skills and Problem Behaviors

	Teacher-report SSRS		Mother-report SSRS		Teacher-report CBCL		Mother-report CBCL	
	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)
<b>Level-1</b>								
<i>Parent involvement</i>	-	3.37*** (0.64)	-	-0.32 (0.54)	-	-1.25** (0.38)	-	-0.92* (0.38)
Income-to needs ratio	-	-0.24 (0.19)	-	0.14 (0.17)	-	0.08 (0.13)	-	-0.03 (0.11)
Children in the household	-	.92 (0.85)	-	1.05 (0.63)	-	-0.65 (0.53)	-	0.26 (0.34)
Maternal marital status	-	-0.58 (1.34)	-	1.07 (0.98)	-	0.29 (0.71)	-	-1.16 (0.63)
Hours of maternal employment	-	-0.02 (0.03)	-	0.03 (0.02)	-	0.01 (0.02)	-	0.01 (0.01)
Teacher experience	-	-0.01 (0.02)	-	-0.02 (0.02)	-	0.01 (0.01)	-	0.02 (0.01)
Classroom quality	-	.11** (0.03)	-	0.03 (0.03)	-	-0.09*** (0.02)	-	-0.03 (0.02)
<b>Level-2</b>								
Intercept	102.93*** (0.32)	0.02* (0.01)	106.14*** (0.30)	-0.05*** (0.01)	50.54*** (0.20)	-0.00 (0.01)	47.53*** (0.20)	-0.05*** (0.01)
<i>Avg. Parent Involvement</i> <sup>a</sup>	2.46* (1.07)	-0.00 (0.04)	4.41** (1.28)	0.01 (0.03)	-0.95 (0.75)	-0.01 (0.02)	-1.30 (0.92)	0.00 (0.02)
<b>Early Childhood Family Variables</b>								
Child Male	-0.33 (0.65)	0.00 (0.02)	0.44 (0.66)	-0.02 (0.02)	-0.32 (0.50)	-0.02 (0.01)	-0.21 (0.37)	0.00 (0.01)
Child Black	-1.45 (1.03)	-0.02 (0.05)	-2.14 (1.25)	0.06 (0.04)	0.70 (0.92)	0.03 (0.03)	-1.00 (0.94)	-0.02 (0.02)
Child Hispanic	-0.16 (1.44)	-0.07 (0.06)	-0.63 (1.55)	0.01 (0.04)	-0.15 (0.87)	0.03 (0.03)	-1.64 (0.90)	-0.03 (0.02)
Child other ethnicity	0.51 (1.55)	-0.01 (0.06)	-0.32 (1.46)	-0.04 (0.04)	-0.87 (1.02)	-0.02 (0.03)	-1.42 (1.22)	-0.03 (0.02)
Maternal Age	-0.05 (0.07)	0.00 .00	0.01 (0.07)	-0.00 (0.00)	0.02 (0.05)	-0.00 (0.00)	-0.09 (0.04)	-0.00 (0.00)
Maternal Education	0.32 (0.18)	-0.00 (0.01)	0.09 (0.19)	-0.00 (0.01)	-0.05 (0.15)	0.00 (0.00)	0.06 (0.12)	-0.00 (0.00)
PPVT score <sup>b</sup>	0.02 (0.02)	0.00 (0.00)	0.07* (0.03)	-0.00 (0.00)	-0.02 (0.02)	-0.00 (0.00)	0.02 (0.02)	0.00 (0.00)
Average early income-to-needs <sup>c</sup>	0.04 (0.17)	0.02* (0.01)	-0.51* (0.20)	0.01* (0.00)	-0.10 (0.14)	-0.01 (0.01)	-0.01 (0.11)	0.00 (0.00)
Average HOME scores <sup>d</sup>	2.98*** (0.60)	0.00 (0.02)	1.14 (0.67)	0.02 (0.01)	-2.01** (0.53)	0.01 (0.01)	-0.80* (0.38)	0.00 (0.01)
<i>Early Outcome Score</i> <sup>e</sup>	0.05 (0.03)	-0.00 (0.00)	0.57*** (0.03)	0.00*** (0.00)	0.13*** (0.02)	0.00 (0.00)	0.64*** (0.02)	-0.00 (0.00)
<b>Middle Childhood Family Variables</b> <sup>a</sup>								
Average Marital status	2.26* (1.04)	-0.06 (0.04)	0.65 (1.09)	-0.00 (0.02)	-1.75* (0.74)	-0.01 (0.02)	-0.68 (0.69)	0.02 (0.02)
Average Maternal Employment	0.02 (0.02)	0.00 (0.00)	0.03 (0.02)	-0.00 (0.00)	0.00 (0.02)	-0.00 (0.00)	-0.01 (0.01)	0.00 (0.00)

	Teacher-report SSRS		Mother-report SSRS		Teacher-report CBCL		Mother-report CBCL	
	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)
Average childhood income	0.08 (0.15)	-0.01 (0.01)	0.40* (0.16)	-0.00 (0.00)	-0.05 (0.12)	0.01 (0.00)	-0.26** (0.09)	0.00 (0.00)
Average children in home	0.57 (0.43)	0.00 (0.01)	-0.01 (0.42)	0.01 (0.01)	-0.36 (0.32)	0.00 (0.01)	-0.68** (0.24)	0.00 (0.01)
<i>Classroom Variables<sup>a</sup></i>								
Average teacher experience	0.15* (0.06)	0.00 (0.00)	-0.03 (0.05)	-0.00 (0.00)	-0.12** (0.04)	-0.00* (0.00)	0.03 (0.04)	-0.00 (0.00)
Average classroom quality	0.32** (0.11)	0.01 (0.01)	0.08 (0.13)	-0.00 (0.00)	-0.22** (0.07)	-0.00 (0.00)	-0.18* (0.08)	-0.00 (0.00)

Note. N = 1364

<sup>a</sup>Data from 1<sup>st</sup>, 3<sup>rd</sup>, and 5<sup>th</sup>

<sup>b</sup>Data from 36 months of age

<sup>c</sup>Data from 6-54 months of age

<sup>d</sup>Data from 15-54 months of age

<sup>e</sup>Data from 54 months of age

\* p < .05.

\*\* p < .01.

\*\*\* p < .001

**Table 6**  
Multilevel Growth Models of Teacher-reports of Parent Involvement Predicting Social Skills and Problem Behaviors

	Teacher-report SSRS		Mother-report SSRS		Teacher-report CBCL		Mother-report CBCL	
	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)
<b>Level-1</b>								
<i>Parent involvement</i>	-	1.85** (0.47)	-	0.14 (0.34)	-	-0.80* (0.31)	-	-0.04 (0.24)
Income-to needs ratio	-	-0.24 (0.18)	-	0.14 (0.17)	-	0.08 (0.13)	-	-0.03 (0.10)
Children in the household	-	0.71 (0.87)	-	0.98 (0.61)	-	-0.55 (0.54)	-	0.26 (0.32)
Maternal marital status	-	-0.97 (1.35)	-	1.12 (0.96)	-	0.43 (0.72)	-	-1.05 (0.61)
Hours of maternal employment	-	-0.02 (0.03)	-	0.03 (0.02)	-	0.01 (0.02)	-	0.01 (0.01)
Teacher experience	-	-0.01 (0.03)	-	-0.02 (0.02)	-	0.00 (0.02)	-	0.02 (0.01)
Classroom quality	-	0.09* (0.04)	-	0.03 (0.03)	-	-0.08** (0.02)	-	-0.02 (0.02)
<b>Level-2</b>								
Intercept	102.93*** (0.31)	0.04* (0.01)	106.14*** (0.30)	-0.05*** (0.01)	50.54*** (0.19)	-0.01 (0.01)	47.53*** (0.20)	-0.05*** (0.01)
<i>Average Parent Involvement<sup>a</sup></i>	6.56*** (0.62)	0.03 (0.02)	2.58*** (0.64)	.01 (0.02)	-3.81*** (0.37)	-0.01 (0.02)	-0.83 (0.54)	0.01 (0.02)
<b>Early Childhood Family Variables</b>								
Child Male	-0.18 (0.62)	-0.00 (0.02)	0.56 (0.67)	-0.02 (0.02)	-0.43 (0.47)	-0.02 (0.01)	-0.26 (0.37)	0.00 (0.01)
Child Black	-2.17* (0.99)	-0.03 (0.05)	-2.50 (1.30)	0.06 (0.04)	1.10 (0.88)	0.03 (0.03)	-0.86 (0.92)	-0.02 (0.02)
Child Hispanic	-0.23 (1.31)	-0.08 (0.06)	-0.97 (1.51)	.01 (0.04)	-0.17 (0.82)	0.03 (0.03)	-1.53 (0.89)	-0.03 (0.02)
Child other ethnicity	0.97 (1.56)	-0.01 (0.06)	-0.26 (1.45)	-0.04 (0.04)	-1.17 (1.01)	-0.02 (0.03)	-1.46 (1.21)	-0.03 (0.03)
Maternal Age	-0.10 (0.07)	0.00 (0.00)	-0.00 (0.07)	-0.00 (0.00)	0.04 (0.04)	-0.00 (0.00)	-0.08 (0.04)	-0.00 (0.00)
Maternal Education	0.16 (0.18)	-0.01 (0.01)	0.02 (0.19)	-0.00 (0.01)	0.04 (0.15)	0.00 (0.00)	0.08 (0.12)	-0.00 (0.00)
PPVT score <sup>b</sup>	0.02 (0.02)	0.00 (0.00)	0.07* (0.03)	-0.00 (0.00)	-0.02 (0.02)	-0.00 (0.00)	0.02 (0.02)	0.00 (0.00)
Average early income-to-needs <sup>c</sup>	-0.05 (0.17)	0.02* (0.01)	-0.55** (0.20)	0.01* (0.00)	-0.04 (0.14)	-0.01 (0.01)	0.00 (0.11)	0.00 (0.00)
Average HOME scores <sup>d</sup>	1.66* (0.61)	-0.01 (0.02)	0.97 (0.66)	0.02 (0.02)	-1.19* (0.50)	0.01 (0.02)	-0.73* (0.36)	0.00 (0.01)
<i>Early Outcome Score<sup>e</sup></i>	0.04 (0.03)	-0.00 (0.00)	0.57*** (0.03)	0.00*** (0.00)	0.12*** (0.02)	0.00 (0.00)	0.64*** (0.02)	-0.00 (0.00)
<b>Middle Childhood Family Variables<sup>a</sup></b>								
Average Marital status	1.13 (0.92)	-0.07 (0.04)	0.39 (1.05)	-0.00 (0.02)	-1.06 (0.66)	-0.01 (0.02)	-0.60 (0.63)	0.02 (0.02)
Average Maternal Employment	0.06*** (0.02)	0.00 (0.00)	0.04* (0.02)	-0.00 (0.00)	-0.02 (0.02)	-0.00 (0.00)	-0.01 (0.01)	0.00 (0.00)

	Teacher-report SSRS		Mother-report SSRS		Teacher-report CBCL		Mother-report CBCL	
	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)	Intercept (SE)	Slope (SE)
Average childhood income	0.09 (0.14)	-0.01 (0.01)	0.41* (0.16)	-0.00 (0.00)	-0.06 (0.12)	0.01 (0.00)	-0.27** (0.09)	-0.00 (0.00)
Average children in home	0.85* (0.35)	0.00 (0.01)	0.10 (0.41)	0.01 (0.01)	-0.53 (0.27)	0.00 (0.01)	-0.72** (0.23)	0.00 (0.01)
<b>Classroom Variables<sup>a</sup></b>								
Average teacher experience	0.14* (0.06)	0.00 (0.00)	-0.05 (0.05)	-0.00 (0.00)	-0.11** (0.04)	-0.00* (0.00)	0.04 (0.04)	-0.00 (0.00)
Average classroom quality	0.32** (0.10)	0.01 (0.01)	0.09 (0.12)	-0.00 (0.00)	-0.22** (0.07)	-0.00 (0.00)	-0.17* (0.08)	0.00 (0.01)

Note. N = 1364

<sup>a</sup>Data from 1<sup>st</sup>, 3<sup>rd</sup>, and 5<sup>th</sup>

<sup>b</sup>Data from 36 months of age

<sup>c</sup>Data from 6-54 months of age

<sup>d</sup>Data from 15-54 months of age

<sup>e</sup>Data from 54 months of age

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$