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Parent Involvement in Head Start and Children's Development: Indirect Effects Through Parenting

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Abstract

The authors examined the extent to which parent involvement in Head Start programs predicted changes in both parent and child outcomes over time, using a nationally representative sample of 1,020 three-year-old children over 3 waves of the Family and Child Experiences Survey. Center policies that promote involvement predicted greater parent involvement, and parents who were more involved in Head Start centers demonstrated increased cognitive stimulation and decreased spanking and controlling behaviors. In turn, these changes in parenting behaviors were associated with gains in children's academic and behavioral skills. These findings suggest that Head Start programs should do even more to facilitate parent involvement because it can serve as an important means for promoting both parent and child outcomes.

Keywords

early childhood education; low-income families; parenting; parent involvement; school readiness

An extensive body of literature indicates that children from low-income families enter kindergarten ill prepared to learn, anywhere from one-half to a full standard deviation below their more advantaged peers (Duncan & Magnuson, 2013). Unfortunately, once children fall behind, they often stay behind (Reardon, 2011). One generally accepted method for improving the school readiness of low-income children has been investing in early education programs for them (Duncan & Magnuson, 2013). Past research on early education has led to increased efforts in recent years to improve access to early care and education programs as a means of improving the school readiness of young children, especially those from low-income families.

Despite this growth in the number of children enrolled in early childhood programs, their long-term benefits have remained elusive (Puma et al., 2010). Recent findings that children learn best when they receive support for learning in their homes as well as in preschool settings (Crosnoe, Leventhal, Wirth, Pierce, & Pianta, 2010) suggest that preschools that can successfully extend support for learning to the home context may be the most successful in promoting children's school success. Many early childhood programs do in fact focus on both children and parents, implementing what is known as a *two-generation approach* (Chase-Lansdale & Brooks-Gunn, 2014), with Head Start as the earliest and most well-

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known example. Yet exactly how programs like Head Start, which are primarily child directed, can change parenting behavior in the home is not fully understood. In this study we tested the hypothesis that the crucial mechanism in the Head Start program is parent involvement, such that by becoming involved, parents learn new ways to improve their parenting behavior, and that such changes create a parent-mediated mechanism for Head Start to have a positive impact on the lives of children.

Head Start and the Promotion of Parent Involvement

The Head Start program is the largest federally funded early childhood compensatory program in the United States, serving nearly 1 million low-income children and families (Administration for Children and Families [ACF], 2014). Head Start was founded as a two-generation program that provides early education for children and encourages parents to participate in the program and learn skills that can extend beyond the classroom (Zigler & Muenchow, 1992). Head Start has a heavy emphasis on parent involvement; indeed, its Code of Federal Regulations specifies that parents must be included in all aspects of programs and requires that services be provided directly to parents in order "to enhance their parenting skills, knowledge, and understanding of the educational and developmental needs and activities of their children" (45 CFR Chapter XIII §1304.40 (e) (3), as cited in ACF, 2009, pp. 130–131).

With its two-generation emphasis, Head Start serves as an ideal setting in which to examine the role of parents' involvement in promoting children's early school success, yet there have been limited attempts to understand the extent to which Head Start programs are successful at involving parents. Prior work by Hindman and colleagues (Hindman & Morrison, 2011; Hindman, Miller, Froyen, & Skibbe, 2012) revealed that there are few consistent predictors of parents' school involvement; however, parents do became more involved in Head Start both as the year progresses and when there are more opportunities to be involved. There is also some evidence to suggest that classroom quality and teachers' experience are linked with greater parent involvement (Castro, Bryant, Peisner-Feinberg, & Skinner, 2004). Although these studies have added to our understanding of parent involvement in Head Start, much is still unknown about whether, and indeed how, such efforts at increasing involvement translate into improved outcomes for children. Given Head Start's strong emphasis on parent involvement, programmatic outreach to parents warrants more empirical attention, including the training of teachers in how to engage families (ACF, 2013) and the provision of more practical services, such as transportation and care for children, to overcome obstacles that may hinder parents' participation in the program (Hindman et al., 2012).

Parenting Behaviors as Links Between Involvement and Child Outcomes

There is a rich body of literature indicating that parent involvement during the early years is directly related to children's school success (Dearing, Kreider, Simpkins, & Weiss, 2006; Ginsburg-Block, Manz, & McWayne, 2010; McWayne, Hahs-Vaughn, Cheung, & Wright, 2012; Miedel & Reynolds, 1999). Much of this literature has focused on involvement in elementary school. These findings, however, may not generalize to preschool given that

involvement in early education programs will likely take different forms from, and have different effects than, involvement in elementary school. Given the structured day of elementary school, parent involvement at this stage typically manifests as monitoring homework and attending organized events such as PTA meetings. In contrast, the more flexible schedule of early childhood settings and the expectation that parents should be more heavily involved allow more opportunities for and acceptance of parent involvement (Arnold, Zeljo, Doctoroff, & Ortiz, 2008). It is also likely that the early childhood setting is generally more accustomed to and accommodating of parents' presence in the classroom and the center than elementary schools are. Parents' involvement in early childhood settings can take many forms, but the most frequent activities are volunteering in classrooms, attending parent–teacher conferences, and attending other school-related functions (e.g., workshops and school board meetings; Castro et al., 2004).

Although it is possible that parent involvement in Head Start could have direct benefits for children, it is more likely that it will have indirect effects through improvements in parenting behavior, and it was these indirect pathways that the founders of Head Start had in mind when they decided to promote parent involvement (Zigler & Muenchow, 1992). Parent involvement was thus viewed as a means of building parents' social and cultural capital. By getting parents involved, Head Start staff could enhance parents' skills, attitudes, and knowledge, which in turn could lead to positive gains in children's development. To date, these potential indirect pathways have not been examined, but we explored them in this study. To be specific, in the present study we examined three potential parenting mediators that have been shown to be important for promoting child development, namely (a) cognitive stimulation (Crosnoe et al., 2010; Gershoff, Aber, Raver, & Lennon, 2007), (b) spanking (Gershoff, 2002, 2013), and (c) controlling behaviors (Grolnick, 2003).

Parents' Cognitive Stimulation

Social capital theory (Coleman, 1988) and the *parent investment model* (Foster, 2002) propose that the more parents invest in their children, the better children's achievement and behavior will be. Such investments are not restricted to money but also include time parents spend with their children in child-focused activities. When parents spend time reading a book to their children they are investing in their literacy skills, and when they count blocks while children stack them into a tower they are investing in their numeracy development. Such behaviors are cumulatively referred to as *cognitively stimulating activities* and have been linked with children's academic achievement (Crosnoe et al., 2010).

An intergenerational perspective on social capital and parent investment implies that if parents were not provided cognitively stimulating environments from their own parents, they may not know how to engage in such activities or be aware of their importance for children's development. It is in both these areas that programs like Head Start can provide intervention. Head Start teachers can build parents' social capital by modeling cognitively stimulating activities such as reading books and playing math-related games. When parents become involved by volunteering in the classrooms or elsewhere in the center they can imitate the activities they have observed and apply these new skills in their interactions with their children at home.

There is some evidence that parents with children in Head Start do in fact increase their cognitively stimulating activities with their children. The randomized control trial of the program, known as the Head Start Impact Study, found that parents whose children were randomly assigned to Head Start were more likely to engage in a variety of cognitively stimulating activities with their children than parents whose children were not assigned to Head Start (Puma et al., 2010). Similarly, Hindman and colleagues (2012) documented improved cognitive stimulation in the home when parents were more involved in the Head Start program. Although these findings confirm that Head Start involvement can improve cognitive stimulation, whether involvement is the catalyst for this improvement, and whether any observed improvements in parenting translated into benefits to children's development, have yet to be explored.

Parents' Use of Spanking

Another important skill parents can learn from their involvement in Head Start is how to manage children's behavior without harsh forms of discipline such as spanking. Head Start teachers model positive methods of discipline that parents can learn and then use at home with their own children and thereby replace punitive forms of discipline such as spanking (ACF, 2009). Spanking in particular has been shown to be both ineffective and potentially harmful for children's early behavior (Gershoff, 2002, 2013) and academic achievement (Ferguson, 2013). If involvement in Head Start can reduce parents' use of spanking, this may be an important way to improve children's development.

There is evidence that Head Start attendance is linked with reductions in parents' use of spanking (Puma et al., 2010; Zhai, Waldfogel, & Brooks-Gunn, 2013). A small-scale qualitative study revealed that mothers who were actively involved in Head Start were less likely to spank their children and were more likely to use nonpunitive forms of discipline, such as time-outs (Bruckman & Blanton, 2003). The Head Start Impact Study documented similar trends, such that teenage mothers and mothers of 3-year-olds spanked their children less often if they were enrolled in Head Start (Puma et al., 2010). There is also some supportive evidence from the evaluation of Early Head Start, which found that programs that included only a school-based component had no impact on parents' use of spanking, but programs with a mixed approach (home visits and school component) did have a positive impact (Chazan-Cohen, Raikes, & Vogel, 2013). It remains unclear, however, whether it is preschool involvement per se that improves parents' use of spanking and whether these improvements, in turn, are linked with children's development.

Parental Controlling Behaviors

Although there is no one best way to parent a child, parenting styles that are high in warmth and low in harsh control are often associated with healthy child development (Darling & Steinberg, 1993; Joussemet et al., 2008); however, these processes may operate differently based on family and cultural context (Pungello, Iruka, Dotterer, Mills-Koonce, & Reznick, 2009). In general, parents who impose too much control risk interfering with their children's development of moral internalization and social skills (Hoffman, 1983; Lepper, 1983). When parents engage in overly controlling behaviors as a means of managing their children's behaviors, children are likely to attribute their compliance to such external control

rather than to internal motivations to behave (Lepper, 1983). Children who do not have internalized reasons for behaving morally and appropriately are more likely to develop defiant and delinquent behaviors. Indeed, a longitudinal study conducted in Canada found that children whose parents were highly controlling were most likely to follow a trajectory of high and consistent violence from kindergarten to sixth grade (Joussemet et al., 2008). Behaviors that are reflective of an overall controlling style may also determine the extent to which parents engage in problematic behaviors, such as spanking or failing to read to children. Controlling parenting behaviors reflect parents' attitudes about children's need to be controlled (Grolnick, 2003), and it may be that changing such attitudes is necessary before a change in a concrete behavior such as spanking or reading can be realized.

Parents' controlling behaviors would appear to be an important target for intervention, including in early education programs. Yet because most preschool programs do not include explicit instruction on parenting, much of their influence on these behaviors is exerted through the modeling of appropriate and effective discipline that parents can observe and later imitate. Parents may observe teachers talking in calm voices and using directive but not demanding statements ("It's time to put the blocks away," rather than "Put the blocks away now!"). They may observe teachers giving children choices ("Do you want to paint first or play with blocks first?") that allow children control over their own behavior. Thus, parents who are involved in Head Start may have more opportunities to learn and practice these parenting techniques that deemphasize parental control while still effectively managing child behavior. Whether parent involvement has implications for parents' controlling behavior—and, in turn, children's academic and behavioral skills over time—was explored in this study.

The Current Study

In this study we examined the programmatic features that promote parent involvement in Head Start settings and whether such involvement constitutes a mechanism for improvements in parenting and in child outcomes. We hypothesized that involvement in Head Start would predict positive changes in parents' home behavior and that any improvements in parenting would predict improvements in children's development over time. Using data from a nationally representative sample of Head Start children and families, we addressed the following questions:

1. Which organizational features of Head Start, including practical services and teacher and staff training in parent involvement, promote parent involvement in Head Start?
2. Does parent involvement in Head Start predict changes in parenting practices over time?
3. Are the observed changes in parenting the mechanism for the association between parent involvement and gains in children's academic achievement and behavioral skills?

We tested the hypothesized mediational model presented in Figure 1 using three waves of data across 2 years. To increase our confidence that parent involvement in Head Start was

indeed predicting long-term changes in parenting behavior, we used parent involvement at spring of Year 1 to predict changes in parenting from spring of Year 1 to spring of Year 2. Similarly, to determine whether any involvement-induced changes in parenting predicted changes in children, we examined changes in parenting from spring of Year 1 to spring of Year 2 to predict changes in children's outcomes from fall of Year 1 to spring of Year 2; thus, the initial child behavior and achievement measures preceded the measure of parent involvement. In addition to controlling for center- and family-level factors that may affect involvement we included three predictors of parent involvement ([a] support and services from the center, [b] staff training in parent involvement at fall of Year 1, [c] parents' obstacles to involvement at spring of Year 1). We also tested the possibility that changes in parents' controlling behavior predicted both changes in spanking and changes in cognitive stimulation through direct paths in spring of Year 2.

Although we used a longitudinal data set and focused on the prediction of change in our outcome variables, the data from the Family and Child Experiences Survey (FACES 2006; see http://www.acf.hhs.gov/programs/opre/research/project/head-start-family-and-child-experiences-survey-faces) are nonexperimental and thus we cannot be confident about causality. We can, however, increase our confidence by testing alternative models and comparing them with our hypothesized model. We tested three such alternatives drawn from the literature. First, it is possible that parent involvement has direct links with child outcomes, as has been found in previous literature (e.g., Arnold et al., 2008; Hindman & Morrison, 2011), or has indirect links through other unmeasured factors. To test this possibility, our first alternative model included direct paths from parent involvement to all child outcomes. Second, there has been a growing recognition that children evoke changes in parenting behavior that in turn support their early achievement (Ansari & Crosnoe, 2015; Crosnoe, Augustine, & Huston, 2012). It might be that the behavior of children who enter Head Start high in academic skills or behavior problems drives parents to become more or less involved over the course of the Head Start year; thus, children's early behavior may be a third variable predicting both the parenting and child outcomes. To test this possibility, we examined a model in which we included direct paths from children's incoming skills to parents' involvement, cognitive stimulation, controlling behavior, and spanking. A third plausible alternative would be that parents whose parenting skills started high, or who were motivated to improve over time, were most likely to be involved in the Head Start program. To test this hypothesis, we conducted a model in which we reversed the paths from involvement to parenting and used parents' initial parenting skills as predictors of their involvement in both the 3- and 4-year-old years. By testing these three alternative models we were able to gain more confidence that our final model is robust to other interpretations.

Method

The FACES 2006 cohort followed a nationally representative sample of 2,020 three-year-old and 1,295 four-year-old children enrolled in 125 Head Start centers across the country between their enrollment in Head Start (fall 2006) and the end of their kindergarten year (spring 2008 or 2009). To achieve the goal of a nationally representative sample, FACES 2006 used a probability-proportional-to-size design in the first three stages (program, center, and classroom) followed by a fourth stage (children) that used equal probability sampling. In

all, 60 programs were selected, two centers per program, and up to three classrooms per center, for a total of 415 classrooms. Approximately 10 children were selected per class, with an oversampling of 3-year-olds to account for the additional year of follow-up. FACES 2006 also used stratification at each stage of selection to ensure sample representativeness (for more information, see West et al., 2010).

For the purposes of this study, we restricted our sample to children who (a) had experienced Head Start for 2 years, at the age of 3 and 4 (n = 1,203), which allowed us to examine these longitudinal processes within the context of the Head Start program; (b) did not switch language of assessment; (c) had a center-level identification number for clustering purposes; and (d) had a longitudinal sampling weight. The last two exclusions were required for our modeling procedures. These restrictions resulted in a sample of 1,020 children (51% female) enrolled in 118 Head Start centers (see Table 1 for sample demographics). It is not surprising, given our exclusion criteria, that the 15% of 3-year-old children who were excluded from our final sample were more likely to be Latino and from a language minority household. These families were also more likely to have lower levels of education and to be unemployed (but not of lower income); however, these latter differences were largely due to the overlap between indicators of socioeconomic status and children's race/ethnicity and language minority status. Thus, our sample was not representative of Latino dual-language learners in Head Start.

Children were, on average, 40.83 months old at beginning of the Head Start program, and parents averaged 28.5 years. The majority of parent respondents were mothers (87%) and identified themselves as being of Black race (41%) or Hispanic ethnicity (27%), with a smaller number of children coming from families whose race was White (22%) or some other racial group (10%). It is important to note that in FACES 2006 only the parent respondent reported on the family. The majority (66%) of children came from single-parent families, 1 in 3 children had mothers with less than a high school education (32%), and slightly less than half had mothers who were unemployed (44%). Analyses of variance and chi-square tests indicated that family background variables were stable over time; thus, we considered these variables to be time invariant and used values from children's 3-year-old year as covariates.

Measures

Descriptive statistics for the focal variables are presented in Table 2. Internal reliability is reported below for scale scores but not for count variables, for which it is inapplicable.

Practical support to facilitate involvement—During the fall of 2006, center directors provided information regarding whether their center provided any of the following services to encourage parents to participate in Head Start: transportation, child care, interpreters, serving food or snacks, and offering incentives (e.g., door prizes). Items were scored as 0 = no or 1 = yes and summed into a variable that ranged from 1 to 5 (M = 4.31, SD = 0.99).

Teacher and staff training in parent involvement—Education coordinators provided information regarding whether in-service training was provided for teachers in "effective communication with parents" and "involving parents in the classroom" in the fall of 2006.

Information was also collected regarding the extent to which coordinators were themselves involved in promoting parent involvement. Sample items included "supervising and mentoring teachers/staff," "arranging activities that involve parents," and "providing outreach/recruitment services." All five questions were scored as 0 = no or 1 = yes and were combined to create a staff training in parent involvement scale (M = 3.82, SD = 1.20, range: 1–5).

Obstacles to involvement—During the spring of 2007, parents reported whether or not (0 = no or 1 = yes) they had encountered any of 13 obstacles to involvement, with the most frequently reported obstacles being work interference (56%), child care needs (31%), school or training interference (22%), and need for transportation (15%). In an approach taken by Hindman and colleagues (2012), we created a sum variable (M = 1.63, SD = 1.22).

Parent involvement—Parents also reported on how often they had participated in Head Start during their children's 3-year-old year. The parent involvement survey was based on a 5-point Likert scale (0 = *not yet* to 4 = *at least once a week*), with parents indicating how often they had engaged 12 potential activities, from which we created two subscales. Classroom-oriented involvement (α = .70) included the following activities (percentages of parents who reported at least a 2 on the scale ["once or twice"] are given in parentheses): attending parent–teacher conferences (83%), observing in the classroom (73%), having a home visit from Head Start staff (70%), and volunteering in the classroom (62%). Center support involvement (α = .70) was created from the following activities: helping prepare food or materials (56%), attending workshops (49%), attending fundraising activities (34%), participating in the Head Start policy council (26%), and preparing Head Start newsletters (16%). Across activities, 98% of parents reported participating in at least one involvement activity. Furthermore, when we looked at the number of times they had participated in the Head Start program, we noted that parents reported that they participated in social events an average of six times during the year, whereas they participated in the classroom on a minimum of 14 different occasions, on average. The two subscales were highly correlated (r = .65) and thus, similar to the extant literature (e.g., Crosnoe & Kalil, 2010; Hindman et al., 2012; Hindman & Morrison, 2011; McWayne et al., 2012), we created a latent construct of involvement.

Parent cognitive stimulation—Parents reported how often they engaged in cognitively stimulating activities with their children at the spring of each Head Start year using 12 questions from the Home Observation for Measurement of the Environment scale (Caldwell & Bradley, 1984). Questions were scored as 0 = no or 1 = yes and summed into a count variable; sample items included "told child a story" and "taught child letters, words, or numbers."

Parental spanking—During the spring of each year, mothers reported on whether they had spanked their child during the past week and, if so, how many times (range: 0–21). A scale was created with responses truncated at 4 because only 15 and 26 parents at either wave (less than 2% of the sample) reported having spanked their children more than four times in the past week.

Parents' controlling behavior—Parents also reported the degree to which they engaged in controlling behavior toward children, using eight items drawn from the Child-Rearing Practices Report (Block, 1965). Sample items included "I do not allow my child to get angry with me" and "I teach my child that misbehavior will always be punished." Questions were scored on a 5-point scale (1 = *exactly* to 5 = *not much*), and higher scores reflected less optimal behavior (Spring Year 1 α = .62, Spring Year 2 α = .61).

Children's problem behaviors—Teachers rated children's behavior problems (1 = "never," 2 = "sometimes," 3 = "very often") in the fall of the first and spring of the second Head Start years using 14 items from the Behavior Problems Index (Peterson & Zill, 1986). The measure had strong internal consistency (Fall Year 1 α = .90, Spring Year 2 α = 85; West et al., 2010) with sample items including: "hits/fights with other children," "is very restless," and "is unhappy."

Children's approaches to learning—Teachers also reported on children's approaches to learning using 29 items from the Preschool Learning Behaviors Scale (McDermott, Green, Francis, & Scott, 2000). Sample items include "pays attention to what you say," "is reluctant to tackle a new activity," and "is distracted too easily by what is going on in the classroom." The scale was internally consistent (Fall Year 1 α = .91, Spring Year 2 α = .88; West et al., 2010).

Children's literacy skills—Four subscales from three direct assessments were used as indicators of a latent factor for children's literacy skills. First, children's receptive vocabulary was tested using the Peabody Picture Vocabulary Test (PPVT; Dunn & Dunn, 1997). Spanish-speaking children were administered both the PPVT and the Test de Vocabulario en Imagenes Peabody (TVIP; Dunn, Padilla, Lugo, & Dunn, 1986). The PPVT and TVIP are norm-referenced assessments with high published reliabilities (PPVT: Fall Year 1 α = .97, Spring Year 2 α = .91; TVIP: Fall Year 1 α = .93, Spring Year 2 α = .93; West et al., 2010). Second and third, two subscales of the Woodcock–Johnson III Tests of Achievement (Woodcock, McGrew, & Mather, 2001)—the WJ—Letter Word subscale (Fall Year 1 α = .81, Spring Year 2 α = .94; West et al., 2010) and the WJ—Spelling Word subscale (Year 1 α = .79, Year 2 α = .87; West et al., 2010)—were used to assess children's language skills and spelling skills, respectively. Children who failed the language screener or missed three consecutive items within a subscale were assessed with the Woodcock–Muñoz (Woodcock & Muñoz-Sandoval, 1996). Fourth, the Story and Print Concepts task (Mason & Stewart, 1989) was administered to evaluate children's comprehension of basic story concepts and how knowledge of how print is used to convey meaning (Fall Year 1 α = .70, Spring Year 2 α = .78; West et al., 2010).

Children's math skills—Two measures were used as indicators of a latent factor representing children's math skills. First, the Applied Problems subscale of the Woodcock–Johnson was used to assess children's math skills, namely, applied problems, quantitative concepts, and counting. Spanish versions of the assessment were administered to children who failed the language screener. Published reliabilities of the math sections are high (English version: Fall Year 1 α = .88, Spring Year 2 α = .90; Spanish version: Fall Year 1 α

= .84, Spring Year 2 α = .91; West et al., 2010). Second, preschool children's math skills were also evaluated directly through nationally normed assessments that were developed for the Early Childhood Longitudinal Study, Birth Cohort (Snow et al., 2007), which also has strong reliability (Fall Year 1 α = .81, Spring Year 2 α = .91; West et al., 2010). Questions evaluated children's classification, comparison, pattern, and shape recognition skills.

Covariates—To reduce the risk of spurious associations, all analyses controlled for a comprehensive set of child, family, teacher, classroom, and center covariates. Child-level covariates were children's age, gender, and race/ethnicity. Demographic covariates for both parents were age, education, and employment status. Family-level covariates were ratio of income to poverty, family structure, family size, home language, and the parent respondent's relation to the child. To account for the possibility that parents with greater depressive symptoms would both be less involved and have children with more behavior and academic problems, we controlled for their depressive symptoms, measured via the short form of the Center for Epidemiological Studies Depression Scale (α = .91; Radloff, 1977).

Several teacher characteristics were included as covariates, namely, education level, years of experience in early education, whether they had received a degree in early childhood education, and their depressive symptoms (as measured by the Center for Epidemiological Studies Depression Scale). Because the extent to which parent involvement is promoted in a center is likely determined by both the center director and the education coordinator, who is responsible for ongoing training of teachers, we also included as covariates the highest academic degrees of the director and of the education coordinator, as well as whether each had a degree in early childhood education. Finally, to account for the possibility that high-quality classrooms promote both parent and child outcomes, we controlled for the structural quality of the classrooms using the Early Childhood Environmental Rating Scale—Revised Edition (Harms, Clifford, & Cryer, 2005; α = .71–.92); the sensitivity/responsiveness of teachers, using Arnett's (1989) scale; and the frequency of teacher math/literacy instruction.

Analytic Strategy

To address our research questions, we used structural equation modeling with latent factors using Mplus (Version 7; Muthén & Muthén, 1998–2012). The use of latent variables allows for data reduction and for adjustments for measurement error; thus, when there were multiple measures for the same underlying construct we used latent variables. To assess how well our models fit the data, we used the chi-square statistic, the comparative fit index (CFI), the root-mean-square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR). In general, values greater than .90 on the CFI and less than .05 on the RMSEA and SRMR have been considered as indicators of good model fit (Hu & Bentler, 1999).

Missing data were addressed with full-information maximum-likelihood estimation (for composite measures, missing data were handled at the scale, rather than item, level). To account for the nested nature of the data, we clustered at the center level in order to adjust the standard errors for children within the same center (the equivalent of a two-level model with no predictors at Level 2). Finally, we used a longitudinal child-level weight that

adjusted for sampling stratification and nonresponse bias to ensure that our sample was representative of the larger population of Head Start attendees. All analyses used the maximum likelihood with robust standard errors method, which is effective if any variables violate normality.

Finding direct and indirect effects in change models can be difficult because much of the variance is already accounted for by the autoregressive paths. Traditional approaches of testing for mediation (Baron & Kenny, 1986) might fail to detect such complexities, especially in the case of suppression (Hayes, 2009; Shrout & Bolger, 2002). Furthermore, if the effects of parent involvement on child outcomes are delivered only through our parenting mediators, the Baron and Kenny (1986) method would again overlook some key mediators that are statistically possible and of theoretical importance (Hayes, 2009). Thus, recent literature suggests that direct effects between variables are not necessary before testing for indirect effects (Hayes, 2009; Shrout & Bolger, 2002). We followed these recommendations and used the INDIRECT command in Mplus.

Results

Measurement Model

We first conducted a single measurement model for our parent involvement and child outcome latent factors. All factor loadings were significant at $p < .001$ (see Table 2), and our model fit the data well: CFI = .966, RMSEA = .039, SRMR = .041, and $\chi^2(248) = 639.79$, $p < .001$. To confirm our decision to include the child outcomes as four separate factors, we also conducted an alternative model combining children's behaviors (problem behaviors and approaches to learning) into one factor and children's achievement (math and literacy) into another. This model, however, did not fit the data as well: CFI = .939, RMSEA = .050, SRMR = .078, and $\chi^2(275) = 972.94$, $p < .001$; thus, we retained the separate latent factors.

Structural Model

The full hypothesized structural model presented in Figure 1 provided a reasonable fit to the data: CFI = .912, RMSEA = .028, SRMR = .043, and $\chi^2(1,596) = 2,904.72$, $p < .001$. Given the complexity of the model, we will summarize the findings by each successive set of dependent variables in the model, namely, involvement, parenting behavior, and child outcomes. All unstandardized and standardized path coefficients and R^2s are presented in Table 3. We also provide the percentage of variance accounted for by each of the focal predictors in Table 3.

Parent involvement—After controlling for a full set of covariates, we found that teacher and staff training in how to involve parents was linked with more parent involvement in Head Start ($\beta = .10$, $p < .05$). Parents who faced more frequent obstacles, however, were less likely to be involved ($\beta = -.21$, $p < .001$). Furthermore, contrary to our expectations, the practical support and services centers provided to facilitate parent involvement were linked with less, rather than more, involvement ($\beta = -.08$, $p < .05$). Similar to Hindman and colleagues (2012), we also found that measures of center quality and household factors did not consistently predict parent involvement.

Parents' cognitive stimulation, spanking, and controlling behavior—Although parents demonstrated stability in their cognitive stimulation, spanking, and controlling behavior (βs = .28–.51, $p < .001$), their involvement in Head Start predicted these parenting behaviors at the end of the year as well as changes in them over the course of the subsequent year. Parents who demonstrated higher involvement in Head Start were more likely to engage in cognitive stimulation (β = .24, $p < .001$) by the end of the year and to increase such engagement with their children over the following year (β = .10, $p < .001$). Parents' involvement was not associated with concurrent measures of controlling behavior or spanking, but it did predict improvements in controlling behavior over the ensuing year (β = −.07, $p < .05$), which in turn was associated with parents' use of spanking (β = .16, $p < .001$) and cognitive stimulation (β = −.15, $p < .001$). Involvement did not predict changes in spanking directly; however, the indirect pathway from involvement to spanking through change in controlling behaviors was significant (involvement → less controlling behavior → less spanking, $\beta_{indirect} = -.01$, $p < .05$), as was the indirect path to cognitive stimulation (involvement → less controlling behavior → more cognitive stimulation, $\beta_{indirect} = .01$, $p < .05$). Although not shown, we also tested whether the associations between parent involvement and changes in parenting leveled off, but no thresholds were detected.

Indirect effects of parent involvement on child outcomes—By controlling for children's skills at Head Start entry and looking at these same measures over time, we examined whether changes in parenting precipitated by parent involvement predicted children's skill gains. We found indirect effects of involvement on change in children's academic skills through improvements in parents' cognitive stimulation (involvement → more cognitive stimulation → more academic skills, $\beta_{indirect} = .01$, $p < .05$). The effects of involvement on children's behaviors were only indirect, through controlling behavior to spanking, and only at the level of a trend (involvement → less controlling behavior → less spanking → fewer behavior problems, $\beta_{indirect} = -.001$, $p = .09$; involvement → less controlling behavior → less spanking → higher approaches toward learning, $\beta_{indirect} = .001$, $p = .09$). Thus, although involvement predicted improvements in parenting, there were few indirect effects on child outcomes through these changes in parenting.

Parenting behaviors and child outcomes—We did find, however, that improvements in parenting predicted improvements in child outcomes. Changes in parents' cognitive stimulation were associated with children's gains in math (β = .09, $p < .01$) and literacy (β = .07, $p < .05$), but not behavior. Although parents' controlling behavior did not directly predict change in child outcomes, increases in their use of spanking, even at low levels, was associated with more behavior problems (β =.10, $p < .01$) and lower scores on approaches to learning (β = −.11, $p < .01$). Furthermore, change in controlling behavior had an indirect effect on change in child outcomes through change in cognitive stimulation and spanking, and these pathways were specific. Controlling behavior predicted worse child behavior through spanking (controlling behavior → more spanking → more behavior problems, $\beta_{indirect} = .02$, $p < .01$; controlling behavior → more spanking → lower approaches toward learning, $\beta_{indirect} = -.02$, $p < .01$) and predicted less optimal achievement through reductions in cognitive stimulation (controlling behavior → less cognitive stimulation → lower academic skills, $\beta_{indirect} = -.01$, $p < .05$).

Alternative Models

Despite our well-fitting models, we wished to further strengthen our conclusions by testing three alternative models. As noted above, the first such alternative was to add direct paths from parent involvement to all of the child outcomes. Although the alternative model fit the data well, CFI = .912, RMSEA = .028, SRMR = .043, and $\chi^2(1,592) = 2,900.86$, $p < .001$, there was no increase in model fit ($\Delta\chi = 1.42$, $\Delta df = 4$, $p = .39$). It is notable that there were no differences in the substantive findings between the alternative model and our hypothesized model; when taking into account the parent mediators, involvement did not directly predict any child outcomes. Thus, we retained our original hypothesized model.

Our second alternative model was designed to rule out child effects by adding direct paths from children's initial behaviors and academic skills to parents' involvement, cognitive stimulation, controlling behavior, and spanking. This model also fit the data well, CFI = .912, RMSEA = .028, SRMR = .043, and $\chi^2(1,580) = 2,870.40$, $p < .001$, but again did not yield a significant improvement in model fit ($\Delta\chi = 22.78$, $\Delta df = 16$, $p = .45$), and no differences emerged in the substantive findings. Considering that there were no statistical or substantive differences, we concluded that our parent involvement–driven model was not due to child elicitation.

Our final alternative model considered whether parents who enter Head Start with high parenting skills became more involved rather than involvement predicting increases in parenting skills over time. To test this hypothesis, we reversed the paths from involvement to parenting and used parents' initial skills as predictors of their involvement in the Head Start program, both during the 3- and 4-year-old year. Compared to our original hypothesized model, this alternative non-nested model did not fit the data as well: CFI =.910, RMSEA = .029, SRMR = .043, and $\chi^2(1,590) = 2,920.85$, $p < .001$, ΔAkaike Information Criterion = 7,447 (for non-nested models, the Akaike Information Criterion is used for model comparison). Moreover, parents' initial skills were not associated with a direct change in parents' involvement over the course of the ensuing year; neither was involvement during the 4-year-old year associated with any child outcomes. Thus, we concluded that our model was not being driven by parents' initial skills, giving added confidence to our conclusions.

Discussion

Since its inception in the 1960s, parent involvement has been a cornerstone of Head Start (Zigler & Muenchow, 1992), yet little is known about what constitutes effective involvement or why it may promote children's development. Although we know that Head Start attendance is associated with positive parenting (Chazan-Cohen et al., 2013; Puma et al., 2010; Zhai et al., 2013), it remains unclear what drives these effects. To better understand why some programs are more successful than others, we need to examine specific processes that might promote both parent and child outcomes. Thus, this study addressed important gaps in the existing literature by examining (a) predictors of parents' involvement within Head Start, (b) the association of parent involvement with changes in other parenting practices over time, and (c) whether changes in parenting predicted changes in children's academic and behavioral skills.

In this sample of Head Start attendees parents were more actively involved in the classroom than in social gatherings at the center; more specifically, parents actively participated in social events at least six times during the year, whereas they participated in the classroom on a minimum of 14 different occasions. In line with recent work by Hindman and colleagues (2012), we also found that factors identified in the extant literature as important predictors of parents' involvement demonstrated weak or null associations within the FACES 2006 data. These findings might be due to the restricted variability in parents' socioeconomic status, or it might also be that Head Start is creating a more level playing field for parents. This latter possibility is supported by the fact that families did not experience many obstacles to involvement; however, the obstacles they did encounter were strongly linked with less frequent participation.

Two of the most frequently cited reasons for not being involved pertained to parents' work and school schedules, which interfered with opportunities to partake in school activities. It would be beneficial, therefore, if Head Start programs offered a variety of opportunities for involvement that better fit families' schedules. This is particularly important given that the practical support and services (e.g., child care and transportation) currently provided by Head Start programs were not found to promote involvement but instead were linked with reduced involvement. Because the level-of-support-and-services variable was reported by the center directors, it may be that level of support and services is an indicator of a highly disadvantaged sample that has many needs, needs that in turn preclude them from being involved in Head Start. It might also be the case that Head Start centers provide greater support in response to lower levels of involvement, which we unfortunately could not test with the data available.

It is intriguing, however, that teacher and staff training in parent involvement was linked with stronger parent involvement, which to our knowledge has not been demonstrated before. This is of considerable importance for Head Start programs because, within the existing literature, not many center-level processes have been found to promote parent involvement in Head Start (Castro et al., 2004; Hindman et al., 2012; Hindman & Morrison, 2011). Accordingly, teacher and staff training, which is both flexible and affordable, can serve as one means of connecting teachers with parents and ultimately encouraging greater parent involvement.

The importance of getting parents involved was made clear once we examined the links between involvement and both parenting change and child behavior change; specifically, parent involvement was associated with improvements in parents' controlling behavior and cognitive stimulation (directly) as well as with their use of spanking (indirectly). Indeed, this study is consistent with a growing literature indicating that Head Start participation is associated with more positive parenting behaviors (e.g., Puma et al., 2010), but our results also provide promising new evidence to suggest that parent involvement serves as an important mechanism for building parents' social capital and, ultimately, achieving improvements in parenting.

Consistent with our expectations, involvement did not directly support children's learning when accounting for other parenting practices; instead, parent involvement in Head Start

predicted improvements in parenting over the course of a year, and these improvements were in turn predictive of children's development. Similar to the extant literature, we found some specificity of effects. Increases in cognitive stimulation were associated with gains in children's academic skills (Crosnoe et al., 2010; Gershoff et al., 2007), whereas decreases in spanking were associated with reduced behavioral problems (Gershoff, 2002, 2013). We also found that parents' controlling behaviors were not directly linked with children's academic or behavioral skills. It is worth noting, however, that changes in such behaviors were associated with a reduction in parents' use of spanking and an increase in cognitive stimulation and indirectly with children's school success by predicting improvements in parenting. Thus, these data provide correlational evidence to suggest that Head Start is successful in meeting one of its key goals, namely to improve the school readiness of children by improving parenting (Zigler & Muenchow, 1992).

Our use of a nationally representative and longitudinal sample of Head Start attendees is a key strength of this study. By including repeated measures of our parent and child outcomes over time we were also able to focus on whether parent involvement predicted change in parenting and, in turn, change in child behavior. This approach, along with our inclusion of a comprehensive set of covariates, minimizes the possibility that unmeasured variables account for the relations identified in this study. Finally, we tested alternative models that rule out other plausible explanations for our findings, thus lending confidence to our conclusions.

There are, of course, some limitations to our study. First, it is correlational in nature, and although we controlled for a wide range of covariates with lagged child and parent outcomes we cannot make causal inference because there may still be other omitted variables that are linked with involvement and with our outcomes. On the basis of the findings reported herein, future intervention research can be designed more precisely, with a focus on the role of parent involvement in facilitating these demonstrated connections. If our results are confirmed with experimental data, then we can draw more definitive conclusions. Second, our focal parenting variables were based on parent report; thus, these variables share method variance that may have inflated the associations among our parenting constructs. It is important, however, that two of our predictors of involvement were from center directors/education specialists and all child outcomes were based on direct assessments or teacher reports. Third, although we included a robust set of classroom- and center-level factors in our models, we did not have in-depth information on other potentially important factors that might facilitate parent involvement, such as the cultural climate of the center. Considering that there is a great deal of unexplained variance in parents' involvement, both in the current study and the prior Head Start literature (Hindman et al., 2012), such factors deserve closer empirical attention to determine how the program can engage parents.

Fourth, although the reliability of our controlling behavior measure was above recommendations in the literature, it still had moderate reliability; thus, the size of the associations between involvement and controlling behavior are conservative. Along these same lines, there may be variability in how controlling behavior relates to children's outcomes (Pungello et al., 2009); however, given the complexity of our model, this was beyond the scope of this study. Fifth, in line with much of the parent-involvement literature

(Crosnoe & Kalil, 2010; Dearing et al., 2006; Fantuzzo, McWayne, Perry, & Childs,2004; Hindman et al., 2012; McWayne et al., 2012), we examined the overall amount of parent involvement rather than specific types of involvement. Recent advances in person-centered modeling, however, present new opportunities in determining which combinations of involvement activities account for the associations documented in this study and therefore require closer attention. Sixth, almost all parent participants in the FACES 2006 data set were mothers. Head Start programs, however, have established new father-engagement initiatives to raise awareness regarding the importance of fathers (ACF, 2013). These initiatives involve teacher and staff training in creating a father-friendly environment and how teachers and staff can build these important connections with fathers. By doing so, Head Start programs hope to increase father involvement in the program, and more important, their children's lives. In light of these policy initiatives, future research is needed to understand how fathers are involved in Head Start and what Head Start programs can do to specifically support fathers' involvement.

Finally, as in many meditation models, the indirect effects for parent involvement had very small effect sizes, with standardized coefficients of |.01–.02| for children's academic skills and |.001| for children's behavior. The effect of parent involvement on child outcomes, however, ranged from |.03| to |.05|, suggesting that our parenting mediators accounted for approximately 20%–25% of the overall effect of parent involvement on children's achievement and 5% of the overall effect on children's behavior. The latter is smaller, in part because the indirect effect was the product of three regression coefficients. It is important to note, however, that our measure of involvement did not include parenting classes that may have been offered at some Head Start centers; the fact that "everyday" involvement was associated with improvements in a range of home parenting practices is promising, especially when in light of the fact that intrafamily dynamics are difficult to manipulate through large-scale policy. Thus, these small effects should not be dismissed because they can have greater impacts if combined with more direct parent instruction.

With these limitations in mind, our results provide promising new evidence suggesting that parent involvement in Head Start is associated with improvements in parenting over time, and that these improvements are, in turn, associated children's behavior and academic achievement. We also determined that teacher and staff training can promote parent involvement, whereas family-level barriers reduce it. To increase parent involvement, Head Start should consider devoting more time and resources for teacher and staff training while also offering more opportunities for involvement that fit the schedules of the families they serve. At a time when policymakers are seeking to understand how programs influence children's school success, this study provides new evidence that highlights the importance of parent involvement.

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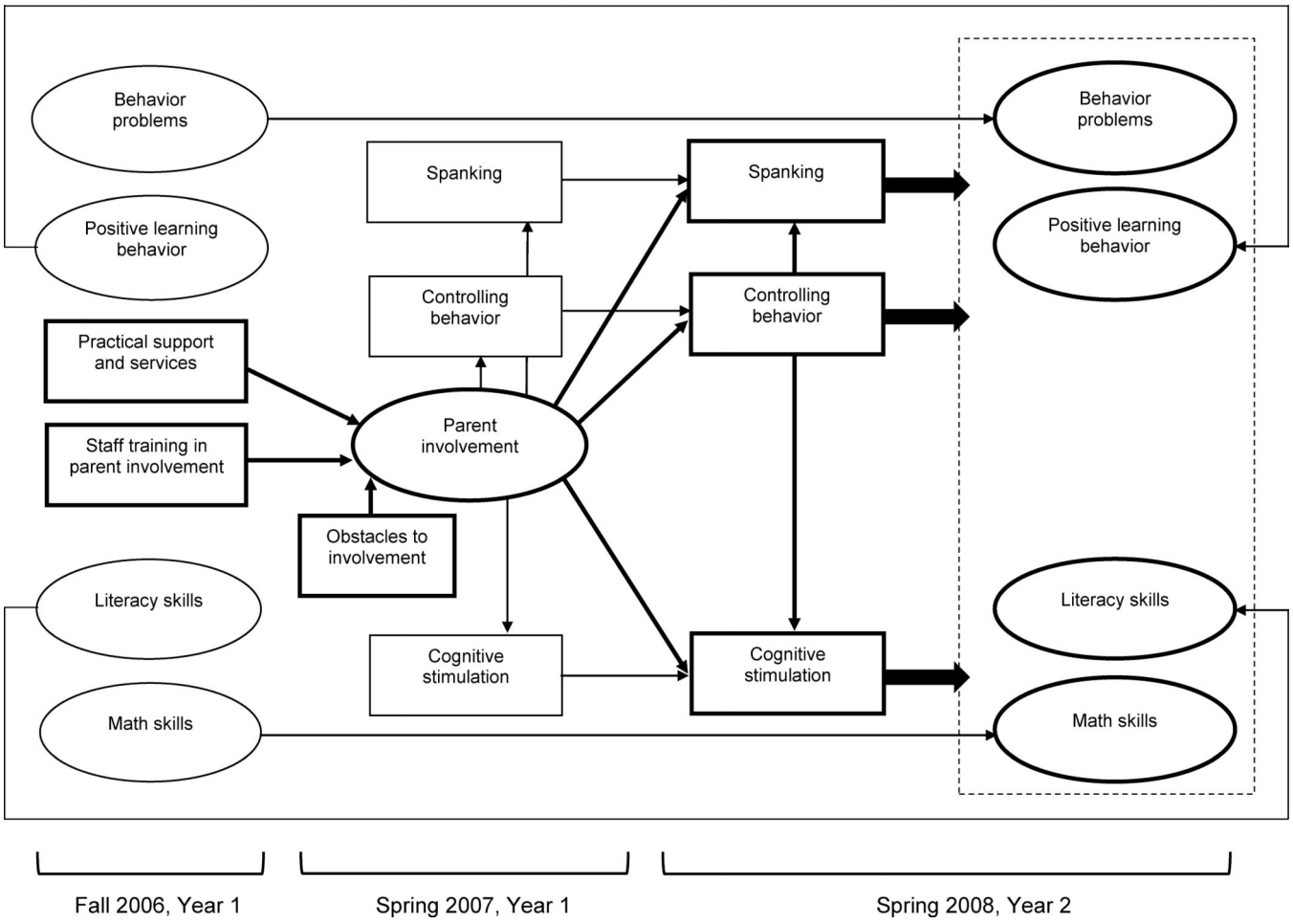

Figure 1.

Hypothesized model of the influence of parent involvement in Head Start on child outcomes mediated through parenting behaviors.

Note: Bold arrows are focal paths of interest. Blocked arrows going through dashed box indicate that all child outcomes were regressed on parenting variables (investment, controlling behavior, spanking).

Table 1

Demographic Characteristics of the Sample

Variable	% or *M* (*SD*)	*n*
Child race and ethnicity		
Black	41.3%	418
Hispanic	26.8%	272
White	21.9%	222
Other	10.0%	101
Child gender		
Female	51.1%	521
Child age (months)	40.83 (3.83)	1,015
Father's age	31.67 (7.48)	879
Mother's age	28.50 (6.02)	994
Father's education		
Less than a high school diploma	37.6%	174
High school diploma/GED	33.5%	155
Some college	20.7%	96
Bachelor's degree or more	8.2%	38
Mother's education		
Less than a high school diploma	31.7%	305
High school diploma/GED	33.4%	321
Some college	28.1%	271
Bachelor's degree or more	6.8%	65
Father's employment status		
Full time	68.2%	307
Part time	14.4%	65
Unemployed	17.4%	78
Mother's employment status		
Full time	33.9%	319
Part time	22.0%	207
Unemployed	44.1%	415
Parent marital status		
Married	34.1%	339
Not married	15.5%	154
Not two-parent household	50.4%	501
Respondent parent depression	1.73 (0.97)	991
Respondent relation with child		
Mother/mother figure	87.0%	864
Household size	4.55 (1.58)	993
Household language		

Variable	% or *M* (*SD*)	*n*
Language majority	83.0%	842
Ratio of income to poverty	2.73 (1.43)	993
Teacher		
Years of experience	12.39 (7.54)	1,018
Highest degree		
High school diploma/GED	5.5%	56
Some college or less	15.9%	162
Associate's degree	41.7%	424
Bachelor's degree	30.5%	310
MA or graduate school	6.4%	66
Specialization in ECE	92.9%	893
Depression	1.51 (0.79)	1,019
Classroom		
Amount of instruction		
Math	5.25 (0.64)	1,019
Literacy	5.10 (0.73)	1,019
Quality	3.58 (0.56)	974
Responsiveness/sensitivity	66.05 (9.72)	979
Program type		
Full day	54.2%	552
Half-day	43.2%	441
Home-based Head Start	2.6%	27
Center director		
Highest degree		
Some college or less	7.6%	75
Associate's degree	18.4%	182
Bachelor's degree	42.1%	417
Graduate school (no degree)	5.2%	51
Graduate school (MA/PhD)	26.7%	264
Specialization in ECE	93.4%	928
Education coordinator		
Highest degree		
Some college or less	1.2%	12
Associate's degree	7.5%	77
Bachelor's degree	33.2%	339
Graduate school (no degree)	11.4%	116
Graduate school (MA/PhD)	46.7%	476
Specialization in ECE	92.3%	941

Note. Measures were collected in the fall of Year 1. ECE = early childhood education.

Table 2

Descriptive Statistics and Factor Loadings for Main Variables in the Model

	Descriptive statistics				Factor loadings			
Variable	**Year 1**		**Year 2**		**Year 1**		**Year 2**	
	***M* (*SD*)**	***n***	***M* (*SD*)**	***n***	**Unstandardized**	**Standardized**	**Unstandardized**	**Standardized**
Obstacles to involvement	1.63 (1.22)	951						
Practical support	4.31 (0.99)	991						
Teacher/staff training	3.82 (1.20)	1,019						
Parent involvement								
Classroom	1.17 (0.68)	955			1.00 [a]	.80		
Social	0.54 (0.55)	955			1.23***	.81		
Parent cognitive stimulation	10.62 (1.49)	956	10.59 (1.56)	956				
Parent controlling behavior	17.92 (3.06)	956	18.18 (2.97)	943				
Parents' use of spanking	0.65 (1.09)	955	0.50 (0.95)	950				
Behavior problems								
Hyperactivity	3.52 (2.91)	987	2.24 (2.58)	968	1.00	.86	1.00	.89
Aggression	1.68 (1.97)	986	1.32 (1.82)	968	0.61***	.79	0.60***	.77
Withdrawal	1.68 (2.05)	986	1.34 (1.83)	968	0.38***	.48	0.42***	.53
Positive learning behaviors								
Persistence	48.62 (10.14)	987	53.16 (8.91)	968	1.00	.92	1.00	.93
Attitude	49.18 (10.05)	987	51.90 (9.10)	968	0.91***	.85	0.89***	.83
Motivation	48.78 (10.08)	987	52.41 (9.35)	968	0.77***	.73	0.80***	.74
Literacy skills								
WJ—Letter Word	297.87 (18.65)	853	336.81 (26.21)	990	1.00	.59	1.00	.72
WJ—Spelling Word	337.58 (28.77)	915	382.62 (28.67)	992	0.77***	.30	0.98***	.68
PPVT	84.72 (15.66)	955	89.95 (15.24)	992	0.88***	.63	0.49***	.66
Story & Print Concepts	2.85 (2.10)	831	6.06 (2.15)	973	0.10***	.54	0.07***	.66
Math skills								

Variable	Descriptive statistics				Factor loadings			
	Year 1		Year 2		Year 1		Year 2	
	M (*SD*)	*n*	*M* (*SD*)	*n*	Unstandardized	Standardized	Unstandardized	Standardized
ECLS-B Math	6.14 (2.40)	939	12.41 (3.62)	973	1.00	.97	1.00	1.00[b]
WJ—Applied Problems	368.48 (24.24)	834	399.77 (20.69)	981	4.98***	.49	4.93***	.91

Note. WJ = Woodcock–Johnson; PPVT = Peabody Picture Vocabulary Test; ECLS-B = Early Childhood Longitudinal Study, Birth Cohort.

[a] According to structural equation modeling requirements, for each factor, one variable loading was set to equal 1.00.

[b] Residual variance was set to .001.

*** $p < .001$.

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Table 3

Unstandardized and Standardized Path Coefficients for the Main Model

Structural model paths by endogenous variable[a]	***B* (*SE*)**	**β**	**Proportion of variance explained**[b]
Parent involvement: $R^2 = .10$			
Obstacles to involvement → parent involvement	−0.11 (0.02)***	−.21	.05
Practical support/services → parent involvement	−0.05 (0.02)*	−.08	.01
Teacher/staff training → parent involvement	0.05 (0.02)*	.10	.01
Parents' controlling behavior: $R^2_{Y1} = .09$, $R^2_{Y2} = .15$			
Controlling Y1→ controlling Y2	0.28 (0.05)***	.28	.08
Parent involvement → controlling Y1	−0.16 (0.15)	−.04	.00
Parent involvement → controlling Y2	−0.32 (0.15)*	−.07	.01
Parent cognitive stimulation: $R^2_{Y1} = .16$, $R^2_{Y2} = .38$			
Cognitive stimulation Y1→ cognitive stimulationY2	0.53 (0.05)***	.51	.22
Parent involvement → cognitive stimulation Y1	0.53 (0.13)***	.24	.05
Parent involvement → cognitive stimulation Y2	0.24 (0.07)***	.10	.03
Controlling Y2 → cognitive stimulation Y2	−0.08 (0.02)***	−.15	.02
Parents' use of spanking: $R^2_{Y1} = .14$, $R^2_{Y2} = .31$			
Spanking Y1→ spanking Y2	0.36 (0.04)***	.41	.15
Parent involvement → spanking Y1	0.05 (0.07)	.03	.00
Parent involvement → spanking Y2	−0.06 (0.04)	−.04	.00
Controlling Y2 → spanking Y2	0.05 (0.01)***	.16	.02
Behavior problems: $R^2 = .43$			
Behavior problems Y1→ behavior problems Y2	0.43 (0.06)***	.47	.24
Cognitive stimulation Y2 → behavior problems Y2	0.00 (0.03)	.01	.00
Controlling Y2 → behavior problems Y2	0.02 (0.02)	.04	.00
Spanking Y2 → behavior problems Y2	0.15 (0.05)**	.10	.01
Positive learning behaviors (PLBS): $R^2 = .36$			

Structural model paths by endogenous variable[a]	*B* (*SE*)	β	Proportion of variance explained[b]
PLBS Y1 → PLBS Y2	0.36 (0.05)***	.41	.18
Cognitive stimulation Y2 → PLBS Y2	0.12 (0.19)	.02	.00
Controlling Y2 → PLBS Y2	−0.04 (0.09)	−.02	.00
Spanking Y2 → PLBS Y2	−0.84 (0.28)**	−.11	.01
Literacy skills: R^2 = .79			
Literacy Y1 → literacy Y2	1.05 (0.10)***	.83	.41
Cognitive stimulation Y2 → literacy Y2	0.06 (0.03)*	.07	.01
Controlling Y2 → literacy Y2	0.01 (0.01)	.01	.00
Spanking Y2 → literacy Y2	−0.07 (0.05)	−.05	.00
Math skills: R^2 = .60			
Math Y1 → math Y2	1.14 (0.16)***	.72	.33
Cognitive stimulation Y2 → math Y2	1.08 (0.36) **	.09	.01
Controlling Y2 → math Y2	0.15 (0.19)	.02	.00
Spanking Y2 → math Y2	−0.74 (0.57)	−.04	.00

Note. Y1 = Year 1; Y2 = Year 2.

[a] Covariances among factors or variables within time and coefficients for control variables are not included in the table but are available upon request.

[b] The proportion of variance explained by each predictor was calculated by taking the difference between the R^2s in the final model and a model omitting the focal predictor.

* $p < .05$.

** $p < .01$.

*** $p < .001$.