

Influences of Parent Engagement in Early Childhood Education Centers and the Home on
Kindergarten School Readiness

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Abstract

This study examined how practices used by early childhood education (ECE) providers to engage parents (e.g., sending home information about the child), parent school involvement in ECE centers (e.g., volunteering, attending meetings) and parent engagement in home learning activities (e.g., reading, stimulating cognitive development) were linked to children's kindergarten academic readiness. Data were from four-year-old children enrolled in center-based ECE settings in the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B; N = 2,250). Path analyses indicated that ECE parent engagement practices were linked to greater parent engagement in home and school settings. Further, ECE parent engagement practices were indirectly associated with kindergarten academic readiness through increases in the quantity of parent engagement in home learning activities. Connections between ECE and home engagement were strongest for families with low household incomes. These results suggest that facilitating ECE practices to promote parent engagement and increasing home learning activities may bolster children's school readiness.

Keywords: early childhood education, parent engagement, preschool, home learning, school involvement, school readiness

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More than half of all 4 to 5-year-old children in the United States are enrolled in center-based early childhood education (ECE) programs (U.S. Department of Education National Center for Education Statistics, 2016). Parent engagement in ECE settings has become a key goal across ECE programs (Matthews, Schulman, Vogtman, Johnson-Staub & Blank, 2015; Starke, 2010; U.S. Department of Health and Human Services, 2011), and is reflected in Quality Rating and Improvement Systems (QRIS) and center accreditation by organizations such as the National Association for the Education of Young Children (NAEYC, 2018). This growing emphasis on parent engagement is based on the assumption that the positive impacts of ECE programs on young children's development may be strengthened when programs partner with parents (Forry, Moodie, Simkin & Rothenberg, 2011). Parent engagement in early learning activities in ECE and home settings has been positively linked to children's school readiness (Ansari & Gershoff, 2016; Hindman & Morrison, 2011; Powell, Son, File & San Juan, 2010; Sheridan, Knoche, Kupzyk, Edwards & Marvin, 2011). The specific mechanisms by which ECE programs influence parent engagement, however, and how this engagement impacts children's early learning, remain unclear (Hindman & Morrison, 2011). The goal of this study is to examine within a nationally representative sample, the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B), how parent engagement during preschool in center-based ECE, including engagement with the child care provider and involvement with the child in the center setting, is linked to parent engagement in learning activities at home, and in turn, how that engagement in both of these settings promotes kindergarten school readiness.

Kindergarten School Readiness

Preparing all children to enter kindergarten ready to learn is a centerpiece of ECE policy at the federal, state and local levels because children who enter school less academically prepared than their peers fall increasingly behind throughout elementary school (Chaudry, Morrissey, Weiland & Yoshikawa, 2017; Shanahan & Lonigan, 2010). In this study, we define children's school readiness as academic skills and abilities such as language, early literacy, and early math skills. For children attending center-based ECE preschool programs, these school readiness skills develop within the context of the relationships among and between the child, the family, and the ECE setting (Mashburn & Pianta, 2006).

Theoretical Foundation: A Bioecological Approach

The present study is guided by the bioecological model of development (Bronfenbrenner & Morris, 2006). Home and ECE settings constitute critical *microsystems* (i.e., immediate contexts with which the child has direct contact) within which children engage in *proximal processes* (i.e., reciprocal, sustained interactions) with parents and teachers; these proximal processes are the primary environmental drivers of development. Parent engagement in the ECE setting, including interactions with the ECE provider and interactions with the child in the ECE setting, constitutes a critical *mesosystem*, that is, an interaction between two microsystems that uniquely impacts child development. When parents are involved in ECE centers, they may build relationships with teachers that in turn help children and parents feel connected to the classroom, and help teachers feel connected to children and parents. For example, ECE providers may share specific information about the child or about child development in general that informs a parent's approach to interacting with their child. Likewise, when parents participate in ECE settings by volunteering or attending events, they may observe the teachers and learn strategies that they can implement at home. In fact, a rationale for emphasizing parental involvement in the initial

development of Head Start was to enhance child development by improving the quality of parental involvement at home (Zigler & Styfco, 2010). Another possibility is that when parents engage with teachers and are involved in ECE settings they have the opportunity to share information with teachers about their children, which in turn enhances the quality of teacher-child interactions (Mashburn & Pianta 2006). In sum, understanding the processes linking home and ECE settings may reveal factors contributing to children's school readiness. More specifically, the goal of this study was to identify one set of pathways by which parent engagement in ECE settings is linked to children's kindergarten academic readiness.

Parent Engagement: A Multidimensional Concept

Parent engagement is sometimes used interchangeably with terms such as parental school involvement, parental or family involvement, or family engagement. In the present study, we draw on the following definition: "parents' support for their young children's learning fostered through relationships with child care and early education programs and providers, which includes parent engagement with programs, as well as their involvement in their children's learning activities" (Child Care and Early Education Research Connections, 2014, p. 1). Notably, this definition includes participation in relationships with ECE providers and participation in specific learning activities with children. Based on previous research (Bromer, Paulsell, Porter, Weber, Henly & Ramsburg, 2011; Child Trends, 2010; Sheridan et al., 2011; Van Voorhis, Maier, Epstein, & Lloyd, 2013), we focus on three different constructs related to parent engagement. *ECE practices* are the strategies and practices ECE providers use to engage families. We consider parent behavior in two key contexts. We examine *parent school involvement* in ECE settings, that is parental involvement in activities in the ECE center. We also

measure *parent home engagement in learning activities*, which are activities parents participate in at home to promote their children's learning.

ECE Practices to Encourage Parent Involvement

ECE practice and policy, including QRIS and NAEYC accreditation (NAEYC, 2018), are increasingly considering strategies that ECE providers use to engage parents. This focus on parent engagement stems in part from research evidence that when parents are more engaged with teachers and show more school involvement in ECE settings, their children are better prepared for kindergarten (Arnold, Zeljo, Doctoroff, & Ortiz, 2008; Powell et al., 2010; Sheridan et al., 2011). ECE practices are strategies ECE providers use to include parents in children's learning and in center-based activities, and to keep parents informed about children's development. Thus, engaging parents promotes children's development through three primary possible pathways. First, when ECE providers encourage parents to participate (e.g., invite them to volunteer, share child's progress in the classroom), parent involvement in ECE settings is more likely to occur (Castro, Bryant, Peisner-Feinberg, & Skinner, 2004; Galindo & Sheldon, 2012; Schulting, Malone & Dodge, 2005), and this school involvement has been directly linked to children's development of academic skills. For example, a study of kindergarteners in the Early Childhood Longitudinal Study – Kindergarten cohort found ECE practices to engage parents were associated with subsequent parent involvement in ECE settings and increases in children's math and literacy scores (Galindo & Sheldon, 2012). When parents feel welcome in ECE settings and feel connected to teachers they may learn about their children's development. Further, they may gain confidence in their abilities to help their children succeed in school, while children may become more engaged in learning when they see connections between parents and teachers. Second, ECE providers' engagement with parents may positively impact children's

learning by improving parental engagement in home learning activities (Forry et al., 2011). For example, among children attending Head Start, ECE engagement practices were associated with both parental school involvement in Head Start center activities and in-home learning activities. The latter, which was indicated by shared book reading with the child, was associated with increases in child vocabulary (Hindman & Morrison, 2011). A third pathway, which we do not directly examine in the present study, may be that when parents are present in children's classroom settings and build relationships with teachers, they may share knowledge with teachers about their children that in turn improves teacher-child relationships and instructional practices, leading to positive child development trajectories (Forry et al., 2011).

There are two key limitations to the conclusions we can draw from this work linking the strategies ECE providers use to engage parents, parent involvement in ECE and home settings and school readiness. First, much of the extant research has focused on Head Start samples. Second, whether there are distinct links between the practices ECE providers use to engage parents and parent involvement in the ECE *and* home contexts is unclear. In the present study, we aim to identify first, how ECE engagement practices are simultaneously linked to parent engagement in ECE and home settings, and second how parent engagement in those two settings is linked to children's kindergarten readiness in a nationally representative sample of children attending pre-school center-based ECE programs.

Parent School Involvement in ECE settings

Parent school involvement in ECE (e.g., in the classroom, on field trips) has been linked to children's acquisition of school readiness skills in several empirical studies (Ansari & Gershoff, 2016; Hindman & Morrison, 2011; Powell et al., 2010). For example, in a study of preschool center-based care, a composite measure of parent-teacher engagement and parent

school involvement in preschool (e.g., communication with the teacher and volunteering) was positively associated with children's literacy skills (Arnold, Zeljo & Doctoroff, 2008). However, what has been described as direct links between parent school involvement in ECE settings and children's learning may in fact be explained by underlying processes whereby parent school involvement in ECE settings influences parental behavior at home in ways that facilitate early learning, linking parent engagement in ECE and home settings. In other words, engaging parents in school settings may be a mechanism by which ECE providers can indirectly influence home learning activities. In fact, when measures of parents' engagement in home learning activities are included along with measures of parental school involvement in ECE settings, then the associations between school involvement and children's academic success are often attenuated or eliminated. For example, Fantuzzo, and colleagues (2004) reported that among families participating in Head Start, parent school involvement at Head Start centers was positively linked with children's school readiness skills in bivariate models, but was unrelated when parent home engagement in learning activities (e.g., reading with child) was controlled for in multivariate models. This finding points to the value of jointly examining links between parent engagement in ECE and home settings that may promote school readiness skills.

School engagement in ECE settings may provide parents with the knowledge, skills, and resources to provide home learning activities that are congruent with what the child is experiencing in school and matched to the child's needs and abilities, thereby exposing parents to cognitively stimulating behaviors and reinforcing school learning at home, ultimately promoting school readiness. For example, in a Head Start FACES sample, parent school involvement in the Head Start center, especially volunteering, was positively associated with the frequency of parent-child book reading and other learning activities at home (Hindman &

Morrison, 2011). That is, it may be these home learning activities that confer advantages for children. Although in some cases parents who have the skills, knowledge, time and motivation to engage in home learning activities may be those who are also most likely also to be involved in school, for some families, the links between parental school involvement in ECE settings and children's kindergarten readiness may be mediated by the home learning environment. In support of these mediating pathways, Ansari and Gershoff (2016) reported that among a Head Start FACES sample, greater parent involvement in Head Start centers (e.g., volunteering in the classroom, attending workshops) was linked to increases over time in engagement in home learning activities such as reading and telling stories, that in turn were directly associated with increases in children's literacy and math skills. Critically, the longitudinal design of that study indicated that parental school involvement in Head Start was positively linked to increases in home learning activities, precluding a selection effect whereby parents who engaged in more home learning activities were also more involved in Head Start centers. These same pathways have not been tested in a preschool sample that includes Head Start and non-Head Start centers.

Most research on parent school involvement in ECE settings combines or looks across specific behaviors such as volunteering or attending school events, rather than examining the unique correlates of these discrete behaviors. That is, we lack specificity in understanding how individual parental school involvement behaviors in ECE centers are linked to kindergarten readiness. However, it seems likely that some of these school involvement behaviors are more closely linked to children's skill development and parents' behaviors at home, and thus are more valuable targets for intervention and practice. Identifying the specific activities that are linked to better child and adult outcomes, and how those activities may or may not be associated with ECE

strategies to engage parents, has the potential to influence ECE engagement practices and opportunities for parent school involvement to improve children's kindergarten readiness skills. Moreover, identifying the parent school involvement activities that are most closely linked to children's kindergarten readiness and home learning may help identify the processes through which these connections occur.

Parent Home Engagement in Learning Activities

Parent engagement in home learning activities represents a key proximal process supporting children's development of kindergarten readiness skills. We consider two different approaches to measuring home engagement in learning activities – the *quantity* of specific learning activities (i.e., self-reported behaviors), and the *observed quality* of home learning activities (i.e., observed behaviors). When parents report engaging regularly in a variety of home-based learning activities, including shared conversations and book reading, their children demonstrate advanced academic school readiness such as language and literacy skills (Ansari & Gershoff, 2016; Bracken & Fischel, 2008; El Nokali, Bachman & Votruba-Drzal, 2010; Fantuzzo et al., 2004; Hindman and Morrison, 2011). Not all studies, however, show influences of the quantity of parent home learning engagement on school readiness (Hindman et al., 2012; Powell et al., 2010). For example, in a longitudinal study of child, family, and classroom factors associated with literacy and math from Head Start entry to the end of first grade, the quantity of parent engagement in home learning did not predict child outcomes (Hindman et al., 2012). This mixed pattern of findings underscores the need for research to understand how and under what conditions the quantity of parent engagement in home learning activities impacts the development of school readiness skills.

One reason for these inconsistencies may be that the quantity of home engagement in learning activities is often based on parental self-reports that do not account for the quality of engagement in these behaviors. The quality of parental home engagement in learning activities, however, is a consistent predictor of children's academic readiness skills (Han & Neuharth-Pritchett, 2014; Rodriguez & Tamis-LeMonda, 2011). For example, in a study of low-income kindergarteners (61% had attended Head Start), observed supportive parent-child engagement by mothers and fathers was associated with higher math and reading achievement (McWayne, Fantuzzo, Cohen & Sekino, 2004). Interventions that intentionally teach parents skills and strategies to improve the quality of their book reading or other cognitively stimulating behaviors result in increases in children's language and literacy skills (Landry, Smith, Swank, Zucker, Crawford & Solari, 2012). The quantity and quality of home learning activities may be related but independent predictors of children's school readiness skills. The observed quality of mothers' parenting behaviors during a book reading task in preschool in the ECLS-B was associated with math skills, whereas the quantity of book reading in this same sample was associated with reading skills (Barnes & Puccioni, 2017). Perhaps the quantity of home learning activities is particularly important for the development of language and literacy skills because it reflects the amount of exposure to language and vocabulary. The acquisition of math skills may require high quality parent engagement that uses scaffolding to facilitate the development of higher-order thinking skills that underlie math (Elliot & Bachman, 2018). To our knowledge, no studies have yet examined these simultaneous links in the ECLS-B using global measures of home learning quantity and quality. Moreover, potential links between parent school involvement in ECE and the quality of home learning remain unexamined.

In sum, there is some evidence that the strategies ECE providers use to engage parents are associated with improved early academic outcomes, but the pathways by which those strategies are effective remain unclear. One potential pathway is via increases in parental school involvement, but the studies showing the strongest links between parental school involvement and children's early academic outcomes tend to overlook parent engagement in learning activities in the home context. That is, despite increasing emphasis on parent engagement in ECE settings, we lack targeted work that simultaneously considers how these strategies may influence children's kindergarten readiness via both home and school-based pathways. Identifying these specific pathways provides critical information for practitioners by identifying which programs may be most successful and how and why other programs can improve their approaches to working with parents to bolster children's kindergarten readiness. The need for research is particularly strong among socioeconomically diverse families.

Economically Disadvantaged Families

ECE programs have long represented a powerful strategy to address intergenerational cycles of poverty. In particular, these initiatives are aimed at children from low-income families who face elevated risks for social and academic problems upon school entry because they may not have had opportunities in early care settings that provide academic components of school readiness (Chaudry et al., 2017; Raver, Gershoff & Aber, 2007). Increasingly, policy makers are calling on researchers to uncover how and why certain programs work for distinct subgroups in order to boost overall effect sizes, particularly long-term effects, of early childhood programs (Shonkoff & Fisher, 2013). Although as noted above much of the research on parent engagement in ECE settings has focused on Head Start samples, and therefore economically disadvantaged families, there is some evidence that in non-Head Start samples, parents from

disadvantaged SES backgrounds may also be less engaged in ECE settings (McIntyre, Ekert, Fiese, DiGennaro & Wildenger, 2007). Drawing from work in kindergarten and early elementary school, economically disadvantaged parents face significant barriers to engagement in schools, yet low-income children may benefit the most from parental school involvement (Hill & Taylor, 2004). Parent school involvement in ECE settings may be particularly beneficial for economically disadvantaged families because this engagement may be a critical source of exposure to learning activities and links to other resources that facilitate parents' engagement in home learning and children's school readiness (Fantuzzo et al., 2004; Mendez, 2010). Therefore, the practices ECE providers use to actively involve and welcome economically disadvantaged parents may be especially critical to their levels of involvement in ECE and home settings.

Differences in the home learning environment, measured as the quantity of engagement in teaching behaviors and provision of learning materials and activities, is one of the most powerful predictors of socioeconomic gaps in school readiness in the United States, accounting for 16-21% of the cognitive school readiness gap between four-year-old children from low- and middle-income households (Waldfogel & Washbrook, 2011). These gaps may in part be accounted for by lack of knowledge regarding how to engage in home learning activities, but may also largely stem from contextual constraints (e.g., financial hardships, stress, unstable work schedules, unreliable transportation, lack of access to educational materials and venues) encountered by low-income families that serve as barriers for participation in home learning activities. ECE providers may be in a powerful position to close some of this opportunity gap by providing parents with resources and tools, especially if they are able to do so by creating a welcoming, culturally responsive environment that also capitalizes on family and child strengths to build lasting partnerships. Identifying processes that contribute to increases in parent home

engagement in learning activities especially among low-income children has critical implications for policy and prevention programs.

The Present Study

We draw from a subsample of children participating in ECLS-B who were enrolled in center-based ECE programs at the preschool data collection time-point. Controlling for preschool levels of academic school readiness, we examine the extent to which ECE practices to engage parents, parent school involvement in ECE centers, and parent home engagement in learning activities are related to academic school readiness assessed in kindergarten (see Figure 1). We consider how the central processes linking parent engagement in two settings to children's kindergarten academic school readiness may vary for low-income families (i.e., at or below 185% of the Federal Poverty Line (FPL)) in comparison to more economically advantaged families. We compare families above and below 185% of the FPL because this is the eligibility cut-off for many public assistance programs.

We address three research questions:

1a. Direct effects: How are ECE practices to engage parents linked to parent school involvement in ECE settings and in at home learning activities? We hypothesize that ECE practices will be positively associated with parent school involvement in ECE settings and engagement in learning activities at home.

1b. Mediated effects: How are ECE practices to engage parents linked to children's academic kindergarten readiness skills? We hypothesize that ECE practices will be indirectly positively associated with kindergarten academic school readiness skills via increases in parent involvement in ECE settings and home learning activities.

2a. Direct effects: How is parent school involvement in ECE centers linked to parent engagement in home learning activities? We hypothesize that parent involvement in ECE centers will be positively associated with the quantity and quality of parent engagement in home learning activities.

2b. Mediated effects: How is parent school involvement in ECE centers linked to academic kindergarten readiness skills? We hypothesize that parent school involvement in ECE centers will be indirectly positively associated with kindergarten school readiness via increases in parent engagement in home learning activities.

3. Moderated Mediation: Do the above processes vary for families who are low income (i.e., below 185% of the FPL)? Given the sparse extant research base, this is an exploratory question with no specific hypothesis. On the one hand, if knowledge regarding effective home learning strategies is a barrier for children's kindergarten readiness among low-income families, then ECE practices to engage parents and parent school involvement may be particularly beneficial for low-income families. On the other hand, if resources (time and money for activities and parent school involvement) are a significant barrier, then ECE practices to engage parents and parent school involvement may be less beneficial for low-income families.

Although we tested specific behaviors indicating parent involvement in ECE centers (e.g., chaperoning), given the lack of theoretical and empirical work at this level of specificity, we did not form specific hypotheses regarding these individual behaviors.

Method

Participants

We conducted secondary analysis of the ECLS-B, a nationally representative sample of approximately 10,700 children born in the United States in 2001 and followed longitudinally from birth to kindergarten (Najarian, Snow, Lennon, & Kinsey, 2010). Data were collected when

children were 9 months-old, 2 years-old, in preschool (age 4) and in kindergarten (age 5 or 6).

We drew a subsample comprising children attending center-based ECE during the preschool assessment (N = 2,250) who entered kindergarten for the first time in 2006 or 2007.

Approximately 17% of the children in the sample attended Head Start. We followed data confidentiality protocols required by the data use license from the United States Department of Education. The Human Subjects Internal Review Board of [BLINDED] declared this project as exempt from review. See Table 1 for weighted sample descriptive information.

Measures

For most of the constructs, we chose available items in the dataset that most closely conceptually align with our constructs, and that have been used successfully by other researchers. The measures included in the ECLS-B were carefully selected by a team of developmental scientists. We include parent, teacher, and center director reports, as applicable. Descriptive statistics for items that comprise focal study constructs are presented in Table 1.

ECE practices. We modeled ECE parent engagement practices as a latent construct indicated by four parent-reported items. On a scale of, 0 = ‘Not at all’, 1 = ‘Just OK’, and 2 = ‘Does it well’, parents reported how well they thought the center kept them informed on how their child was doing in the program, provided information about typical child development, made parents aware of volunteer opportunities, and provided workshops, materials, or advice on how to help children learn at home. We fit a confirmatory factor analysis (see analytical procedures section below), which indicated satisfactory model fit (CFI = .999; RMSEA = .024 (C.I = .000 - .055); WRMR = .348). Factor loadings range from 0.67 to .71. Higher scores on this latent construct represented ECE centers that were perceived to be engaging parents well.

Parent school involvement in ECE centers. Parents responded whether (yes/no) they or another adult in their family had completed the following activities since starting the ECE program: attended a general meeting, gone to a regularly scheduled meeting with teacher, attended a class event, volunteered or served on committee, and attended/chaperoned a field trip. The five engagement items were summed, with scores ranging from 0 to 5. The five engagement practices were associated, without indicating multicollinearity, as indicated by $\alpha = .64$.

Parent home engagement in learning activities. The reported quantity and observed quality of parental engagement in learning activities were measured at the 2-year-old and preschool time point; the former was included as a control variable. First, the reported quantity of home learning was measured by summing three items of how often in a typical week the parent or another family member engaged in three activities (i.e., singing songs, reading stories, and telling stories). The first three items were on a scale of 0 = 'Not at all', 1 = 'Once or twice', 2 = '3 to 6 times', and 3 = 'Every day.' These items have been used in several other studies measuring home learning activities, such as the Head Start Family and Child Experiences Survey (Malone, Kopack Klein, Aikens, Harding, West & Tarullo, 2017). Second, the observed quality of home learning activities was measured with observations of mothers' stimulation of cognitive development during a filmed, 10-minute semi-structured task, the Two-Bags task that were coded on 7-point Likert-type scales. These scales were originally developed in the NICHD Study of Early Child Care (NICHD ECCRN, 1999), and have been shown to be valid and reliable in small and large-scale studies linking the quality of early parent-child interactions to child development (Berlin, Brady-Smith & Brooks-Gunn, 2002; Vernon-Feagans & Cox, 2013). Higher scores indicated that the mother displayed purposeful and developmentally appropriate

behaviors aimed at enhancing the child's cognitive and language development. Interrater reliability on this subscale at both time points exceeded 90% (Najarian et al., 2010).

Kindergarten academic school readiness. School readiness outcomes consisted of standardized measures and items developed specifically for the ECLS-B in three areas: *language skills, early reading, and early math* (Najarian et al., 2010). The battery of ECLS-B cognitive measures was developed by a team of experts and designed to provide comprehensive information across a variety of child skill-levels in an in-home assessment setting (Najarian et al., 2010). All measures were obtained through direct assessments by trained data collectors and were scored using the same procedures in the preschool and kindergarten waves.

Language skills were assessed using the "Let's Tell Stories" subscale from the *Preschool Language Assessment Scales* (PreLAS; Duncan & De Avila, 1998), which assesses the ability to tell a simple narrative with picture prompts, to use complex sentences and to be understood in English. Children were read two stories at each time point, and their responses to the stories were scored from 0 ("no response") to 5 ("articulate, detailed sentences, vivid vocabulary, and complex constructions"; Snow et al., 2009). *Early Reading* was measured as an IRT-derived composite score of 85 items developed for the ECLS-B that assessed receptive vocabulary as well as skills and knowledge related to print, sight word, letter-sound relationship, letter recognition, and words in context. *Early Math* was measured as an IRT-derived composite score of 71 total items developed for the ECLS-B. In preschool, the items measured number sense, geometry, counting, operations, and patterns. In kindergarten, the items measured number sense, properties, operations; measurement; geometry and spatial sense; data analysis, statistics, and probabilities; and patterns, algebra and functions.

Family income. Based on maternal reports of income and household size at the preschool wave, families were classified as above or below 185% of the FPL for the year of data collection.

Family, child, and ECE center covariates. To isolate the focal processes, we controlled for a number of family, child, and ECE center covariates that have been linked with parental school involvement and/or children's school readiness outcomes in other studies, including studies using the ECLS-B (e.g., Keys et al., 2013). We controlled for mothers' self-reported depressive symptoms, marital status, education, home language, and employment status. We also controlled for child race/ethnicity, sex, low birth weight status (from baseline), child BMI, age, and disability status at preschool. Those child health characteristics were included because of recent evidence that health disparities early in life (e.g., BMI) may contribute to socioeconomic-based early achievement gaps (Hair, Halle, Terry-Humen, Lavelle & Calkins, 2006; Holliday, Cimetta, Cutshaw, Yaden & Marx, 2014). Given the focus of much research in this area on Head Start, we also controlled for whether children were enrolled in Head Start vs. other ECE providers. We included average weekly hours in center care, ratio of child: adult directed activities, and teacher-rated closeness and conflict with the child to account for some center-related factors that may influence ECE practices, parent school involvement and ultimately children's kindergarten readiness (Keys et al., 2013; Hindman et al., 2012). To isolate links between ECE school engagement in preschool and home learning activities in preschool, we included home learning activities (quantity and quality) assessed at age 2 as predictors of home learning activities assessed at preschool and kindergarten outcomes. We also controlled for the associations between the three school readiness outcomes assessed in preschool and those outcomes assessed in kindergarten.

Missing Data

Data were missing at rates from 0 – 19%, with greater rates of missing data for teacher-reported items. For all models, we employed full-information maximum likelihood estimation (FIML), which uses all available data and information to estimate parameters with reduced threat of bias (Graham, 2009). FIML is most appropriate when the model includes covariates associated with the missingness on focal study variables; the control variables we included in our analytic models, specifically family race, child disability status, child low birth weight, child age, English language status, and family income were all associated with missingness.

Analytical Procedures

To test the hypotheses 1a and 2a, that ECE practices will be positively associated with parent engagement in both settings and that parent engagement in ECE centers will be positively associated with the quantity (i.e., parent-reported) and quality (i.e., observed) of parent engagement in home learning activities, we estimated direct effects models. In the first model, ECE practices was modeled as a latent factor (confirmatory factor analysis results described above). Given that the latent factor was indicated by ordinal data, models were estimated using the WLSMV.

To test hypothesis 1b and 2b, regarding mediation, the indirect, positive effects of ECE practices and parent school engagement in ECE settings on kindergarten academic school readiness skills via increases in parent engagement in ECE settings and home learning activities, we estimated indirect effects model with bootstrapped estimates, including standard errors and confidence intervals (Preacher & Hayes, 2008).

To test research question 3, regarding the differences in the mediation pathways for poor and nonpoor families, we estimated a multigroup indirect effects model in which we used Wald's test to examine differences in the mediation pathways by family income.

All analyses were conducted in Mplus 7.3, and included all covariates listed above. Given the complex sampling design, we chose the most appropriate weight for our analyses: WKJ230. Given our focus on a subgroup, not the entire ECLS-B sample, we calculated a Design Effect-Adjusted weight from the original weighting variable (WKJ230), and this adjusted weight was used in the direct effects models. This weight adjustment allows our findings to generalize to the entire population of children ages 3-4 in the United States who were in center-based child care between 2004-2005. The indirect effects models were estimated using 90 replicate weights and the Jackknife method (Asparouhov & Muthén, 2010). Additionally, we conducted invariance tests to ensure that constructs were invariant across low-income status (above or below the FPL). We established partial strong invariance across income status for ECE engagement strategies, meaning that the factor loadings for the indicators of ECE parent engagement strategies were invariant across both poor and nonpoor families.

Results

Bivariate Relations

As shown in Table 1, each of the activities comprising parent school involvement in ECE centers were moderately correlated with each other (r ranging from .18 - .37). This pattern suggests that although these behaviors were related, there is still considerable variability in that a parent who did one activity such as attending a conference did not necessarily also participate in other activities such as volunteering. The reported quantity of home learning activities was modestly correlated with the observed home learning activities ($r = .22$), suggesting that these are measures of distinct behaviors.

Direct Effects

Direct effects of select covariates, ECE parent engagement practices and parent engagement in ECE settings on parent engagement in home learning activities and children's kindergarten school readiness skills, are presented in Table 3.

Research question 1a: ECE engagement practices. As shown in Table 3, in support of hypothesis 1a, ECE practices to engage parents, as reported by parents, were associated with higher levels of parent school involvement in activities taking place in the centers (β range = .09 - .31) for each of the measured activities, with the strongest associations for parental conference attendance and parental volunteering ($\beta = .25$ and $.31$, respectively). Additionally, in partial support of hypothesis 1a, ECE parent engagement practices, as reported by parents, were associated with higher levels of reported parent engagement in the quantity of home learning activities ($\beta = .12$), although the size of this association was small.

Research question 2a: Parent school involvement in ECE. In partial support of hypothesis 2a, there was a direct association between one parent school involvement activity, attending a general meeting, and higher levels of parent reported quantity of home learning activities ($\beta = .06$). However, as described in detail below, this association was moderated by family income. In addition, the link between chaperoning a school activity and reported quantity of home learning activities was also moderated by family income. None of the items reflecting parent school engagement in ECE settings were linked to the observed quality of home learning activities

Parent engagement in home learning activities was linked to children's kindergarten readiness skills. Parent-reported quantity of home learning activities was positively associated with children's language skills ($\beta = .11$) and early reading ($\beta = .11$), and observed quality of home learning activities was positively associated with early reading ($\beta = .09$), language skills (β

=.06), and math skills ($\beta = .12$). Additionally, several covariates were associated with kindergarten academic school readiness including maternal education, English as the primary home language, preschool classroom ratios, preschool teacher-child relationship quality, family poverty status and preschool levels of language skills, early reading, and early math skills. Of note was the moderate effect size of the association between English as a primary home language and child language skills ($\beta = .50$), however, English as the primary home language was unrelated to the other indicators of kindergarten readiness. In the model with all predictors, family low income was not independently significantly associated with children's kindergarten academic school readiness.

Research question 3: Variation for low-income families. We did not find that reporting low income during preschool (< 185% of the FPL) moderated the association between ECE practices to engage parents and reported quantity or observed quality of parental engagement in home learning activities, suggesting that the positive association between ECE parent engagement practices and parent engagement in home learning activities is similar across income levels. However, we did find that having a low income during preschool moderated the association between two parent school engagement activities and parent-reported quantity of home learning activities. Specifically, as shown in Figures 2 and 3, chaperoning and attending a general meeting were positively associated with the quantity of parent-reported home learning activities for families with household incomes less than 185% FPL only. Although the interaction regression coefficients suggested an interaction between income and engagement on children's academic school readiness, analyses of simple slopes indicated non-significant slopes and values outside of the regions of significance.

Indirect Effects

Research question 1b: ECE engagement practices. All significant indirect effects along with corresponding 95% bootstrapped confidence intervals are presented in Table 4. As shown, ECE practices to engage parents were significantly indirectly associated with kindergarten language skills and early reading via one pathway: increases in parent reported quantity of home learning activities. Further, in partial support of our hypotheses linking ECE practices to children's kindergarten readiness via school-home connections, we found that ECE practices to engage parents were associated with increased reports of parental volunteering in the classroom, which then indirectly were linked to children's language scores via increased parent reported quantity of home learning activities; although this effect size was small. Given the absence of a significant association between ECE parent engagement practices and child outcomes, the indirect effect of ECE engagement on child outcomes is fully mediated by parent reported quantity of home learning activities.

Research question 2b: Parent engagement in ECE. We found support for one indirect pathway linking parent school engagement to kindergarten readiness via engagement in home learning activities. Volunteering in the classroom was positively associated with children's language and reading scores through increases in parent-reported quantity of home learning activities.

Research Question 3: Variation for low-income families. We found support for one moderated mediation pathway. For low-income families only, attending a school meeting was positively linked to children's language and reading skills through increases in parent-reported quantity of home learning activities.

Discussion

The present study used a nationally representative sample of preschool children attending center-based care to consider how parent perceptions of ECE engagement practices, parent school involvement in ECE settings, and parent engagement in home learning activities (quantity and quality), were related to each other and to three aspects of children's kindergarten school readiness. These findings point to the importance of parent engagement in two microsystems (ECE center and home) for facilitating children's school readiness skills, as we found direct and indirect, via the quantity of home learning activities, links between parent school involvement in ECE settings and children's kindergarten readiness. Further, these pathways emerged above and beyond the influences of prior home learning activities, a range of demographic characteristics and Head Start attendance. The strongest associations in our study linked children's kindergarten readiness to their exposure to the quality and quantity of home learning activities, highlighting the importance of home experiences, even for children attending center-based care. Collectively, these results support the value of encouraging parental engagement in home learning activities to promote school readiness, and the indirect but important role of the mesosystem, where ECE providers can influence school readiness by partnering with parents to increase engagement in children's learning.

ECE Practices to Engage Parents

In partial support of our hypotheses, and consistent with findings from low-income samples (Ansari & Gershoff, 2016; Galindo & Sheldon, 2012; Schulting et al., 2005), we found that in this nationally representative sample, parents' reports of ECE teachers' use of practices to engage parents were positively associated with parent engagement in a variety of activities in the ECE center. The simultaneous reporting of this information may reflect that when parents are in ECE centers, then they also have opportunities to be exposed to messages from the ECE

teachers, or that parents who feel more positive about the information they are getting from teachers are also more likely to want to spend time in the centers. Alternatively, the strategies ECE teachers use may successfully encourage parents to be more involved in the centers. We need longitudinal and/or experimental research to tease apart these relations.

Consistent with research in Head Start and public pre-kindergarten samples (Ansari & Gershoff, 2016; Hindman & Morrison, 2011; Powell, Son, File & San Juan, 2010; Sheridan, Knoche, Kupzyk, Edwards & Marvin, 2011), we found that practices ECE providers use to engage parents are indirectly linked to children's school readiness outcomes via parents home-based behaviors. When parents reported that ECE centers were doing a better job engaging parents, then parents reported engaging more frequently in-home learning activities, in turn leading to greater increases in kindergarten readiness scores in language and reading. Although the indirect effect size is quite small, the direct effects linking ECE practices to the quantity of home learning activities were of similar magnitude to the association between maternal education and home learning activities. When teachers send home information about how the child is doing and what the child is doing in school, parents may use this information to engage in learning at home (Sheridan et al., 2011). That is, this mesosystem process may influence child development through proximal processes in the home setting (Mashburn & Pianta, 2006). At the same time, ECE practices to engage parents were unrelated to the quality of observed home learning activities, although quality was linked to all three measures of kindergarten readiness skills. It is possible that social desirability influenced this pattern of findings, as parents who reported that the ECE providers were doing a good job engaging them may also have felt obligated to report that they were doing a lot of activities. Further, those who had more exposure

to ECE providers by engaging in the ECE centers may have picked up on the importance of home learning activities and thus reported engaging in these activities.

Overall, this different pattern of findings for the quality and quantity of engagement in home learning activities suggests that the information parents are receiving from ECE settings may encourage them to engage in more activities with their children, or parents who do more learning activities at home may perceive that ECE providers are doing a better job of building relationships with them, but these perceptions of ECE practices do not help parents improve the quality of engagement. These findings point to the need for more in-depth measurement of ECE practices and parent involvement in ECE centers to attain a better understanding of what parents may have been gaining (or not gaining) from their involvement in the ECE centers, including any explicit messages or instruction from ECE providers regarding quality activities.

Links between ECE and Home Settings Promoting Kindergarten Readiness

A central goal of our study was to understand if parent school involvement in ECE settings was linked to parent engagement in home settings and children's school readiness skills. Our results point to the relevance of one particular type of parent school involvement in ECE settings, volunteering in the classroom, for both engagement in home learning and children's kindergarten readiness for all families, regardless of income. First, parents who reported that they volunteered in the ECE classroom, also reported doing more learning activities at home, and in turn, their children scored higher on language and reading assessments. Further, one of the pathways linking ECE practices to greater quantity of home learning activities, and ultimately to better child language skills was through volunteering. Although these indirect effects were small, they demonstrate that there are meaningful links between parent school engagement, parent home engagement and children's kindergarten readiness. Similarly, Hindman and Morrison

(2011) reported that volunteering in the Head Start classroom was directly associated with fall to spring increases in children's vocabulary. Drawing from the bioecological model, this positive association between parent engagement in the center and at home may represent consistency or stability in home and school contexts that promotes children's learning (Bulotsky-Shearer, Wen, Faria, Hahs-Vaughn & Korfmacher, 2012; Crosnoe, Leventhal, Wirth, Pierce & Pianta, 2010). Perhaps when parents spend time volunteering in the center they observe classroom practices like singing and reading that they are then able to incorporate into their home routines and practices (Ansari & Gershoff, 2016). At the same time, it could be that parents who are already implementing those behaviors at home feel comfortable participating in those activities by volunteering in the classroom, and subsequently have the time and resources to both volunteer in the classroom and to participate in learning activities at home.

No parent school involvement in ECE centers activity was linked to the quality of engagement in home learning activities, suggesting that sporadically observing high quality interactions in the classroom is not enough exposure to increase the quality of practices at home. Further, parents in all centers were not necessarily exposed to high-quality teacher-child interactions, as there was likely considerable variability in quality across centers (Keys et al., 2013). If these findings are driven by selection factors, then it is interesting to note that parents who do more at home may do more in ECE centers, but those who are engaging in higher quality learning activities at home are not inclined to participate more in ECE settings. Perhaps these parents are confident in the quality of their own engagement in learning activities and see little need to be involved in school settings, or they see the school settings as distinct from home settings. These findings applied to both income groups, as all children seemed to benefit from parental volunteering, and family income was unassociated with volunteering. However, mothers

with more education and those who worked fewer hours were more likely to report volunteering, suggesting that some parents encounter barriers to volunteering activities.

Parent School Engagement in ECE Settings: Moderation by Family Income

Children from economically disadvantaged families, defined in this study as those from households with incomes below 185% FPL, may be particularly likely to benefit from parent engagement in ECE settings. Specifically, when lower income parents chaperoned school trips and attended school meetings, then they also reported engaging in more home learning activities. For lower income families only, attending meetings was indirectly linked to language and reading scores through increased parent home engagement in the quantity of learning activities. Perhaps the interactions they participated in and observed during these activities increased parental understanding of the range of educational activities in which they could engage with their children at home. For example, parents may have learned songs the children were singing at school, and then incorporated those songs into home routines, thus reinforcing specific learning goals and providing continuity of learning experiences between school and home environments. Parents may have received information in these meetings about developmentally appropriate expectations and activities. This exposure may have been particularly critical for lower-income parents who may have been less likely to be exposed to these activities in other contexts (Mendez, 2010). Given the broad category of attending school meetings, it is also possible that these meetings included resource fairs or other opportunities (e.g., health screenings or referrals) for families to be connected with supports that may have helped to reduce some other stressors in their lives, that in turn provided time and energy for home learning. It is also possible that the ECE centers with high rates of parent school involvement in ECE are centers that in general have created a supportive, welcoming and affirming environment that encourages building home-

school partnerships. Alternatively, lower-income parents who have the resources and ability (e.g., work schedules) to engage in more learning activities at home may apply those same resources and abilities to attend ECE meetings and other parent school involvement activities. Despite positive links between attending school meetings and children's kindergarten readiness, lower-income parents were less likely to attend school meetings. In fact, despite being the most common form of parent school engagement across the sample, meeting attendance was the only parent school engagement activity that was reported less frequently by lower-income parents, a finding potentially driven by the types of centers in which families enrolled. That is, the opportunity to attend meetings may be a function of the quality of the centers and/or the availability of parents to attend meetings. In support of this conclusion, Castro and colleagues (2004) reported that parent employment and classroom quality were among the strongest predictor of parental school involvement in Head Start centers. Another possibility is that school meetings may be held at times that are inconvenient for parents with inflexible work schedules and lack of transportation, or for parents who do not have child care to attend meetings held outside the regularly scheduled school day. This finding may point to the value of ECE providers holding meetings for parents at times when economically disadvantaged parents may be able to attend and providing other resources at those meetings such as meals and child care for all children in the family.

We also found stronger evidence linking parent school involvement in ECE settings directly to kindergarten readiness skills for children from lower-income households. Importantly, this finding emerged in this nationally representative sample that included children enrolled in Head Start. Specifically, attending a school event was associated with better reading skills for children from low-income households, and this association was not accounted for by parent

home engagement in learning activities. Perhaps when parents attend school events they become more aware of children's literacy activities and may access other community resources (e.g., libraries) that contribute to children's early learning success (Mendez, 2010). Alternatively, it's possible that teachers paid more attention to and built stronger relationships with children whose parents attended school events. At the same time, it could be that despite our robust set of covariates, the economically disadvantaged parents who are able to be involved in ECE settings are experiencing fewer other risks (e.g., unstable employment schedules, family conflict, parental physical health problems, etc.) that may influence children's kindergarten readiness. For lower income parents only, attending parent-teacher conferences was associated with poorer language skills. Parents of children who are struggling in preschool may be more likely to be asked attend parent-teacher conferences to discuss challenging behaviors. Given that language problems and social skills deficits are correlated in the preschool years (Barnett, Gustafsson, Deng, Mills-Koonce & Cox, 2012), even if conferences are convened to discuss behavioral issues, children may also be demonstrating underlying poor language skills. Parents may feel compelled to attend these parent-teacher conferences even if they feel unwelcome participating in other ECE activities such as volunteering, and these conferences may focus on the child's problems rather than home and school strategies to increase children's school readiness skills (Kuhn, Marvin & Knoche, 2016)

Study Strengths and Limitations

The present study has a number of strengths and limitations. We employed a multi-method approach, as our measures of parent engagement included parent reports and observations of parents' behaviors. In addition, we included individual behaviors indicating parent school involvement in ECE centers rather than lumping these together as a single

construct, which allowed us to identify specific activities (e.g., volunteering) that were linked to children's school readiness and home environments. This approach suggests key areas for future research to identify why some activities were more closely linked to children's school readiness than other activities, and for future practice to target increasing specific parent school involvement activities. We also included direct assessments of children's academic school readiness skills in three domains. Moreover, we controlled for preschool school readiness scores in our predictions of kindergarten school readiness scores. We also employed a rich set of control variables related to child, family, teacher and center characteristics. Although most research on parent engagement in ECE settings has focused on Head Start families, in our nationally representative sample, we found that some processes such as those linking ECE practices directly to kindergarten readiness and the quantity of parent engagement in home learning activities seem to apply regardless of household poverty or Head Start attendance. On the other hand, our findings potentially point to the added value of parent school engagement in ECE settings for lower income families. We included Head Start attendance as a covariate in our models, yet there were no differences in any of the parent engagement variables for children attending Head Start versus those attending other center-based programs.

Despite these strengths, this study has several limitations. First, the ECLS-B data were collected in 2004-2006, making them somewhat dated; however, this remains the only longitudinal comprehensive study of a nationally representative birth cohort in the United States, and thus it is a valuable source of information on trends or patterns that are likely to remain relevant (Sullivan, Farnsworth, & Susman-Stillman, 2018). We would not expect that associations between engagement constructs would change with time; rather, the prevalence of ECE engagement practices or parent engagement may have changed. This sample does mean that

we are unable to generalize findings to international contexts. Second, we used concurrent measures of engagement at home and in ECE centers, and thus we cannot infer directionality. For example, an alternative explanation for our findings may be that when parents are doing more at home, teachers may do more to engage them in the classroom. This also means we are unable to isolate the influence of timing of ECE influences. We controlled for reported and observed home learning activities at age 2 (previous wave of data collection), and in fact these parent behaviors are positively correlated across time and with children's kindergarten readiness outcomes, suggesting some consistency across early childhood. Future studies should build on this work by considering whether the connections among ECE practices to engage parents, parent school involvement in ECE centers, home learning activities and school readiness skills vary as a function of earlier levels of parent school involvement in ECE centers, or whether these are time-specific processes. Third, we relied on the limited measures of ECE engagement practices and parent engagement in ECE settings available in the data, and these measures were focused on parents' reports of the quantity of their own parent school involvement and their perceptions of the quality of ECE engagement strategies, with no way to assess the quality or accuracy of these reports of engagement. The dataset also lacked variables that would help us understand the motivations of teachers and parents for parent engagement, including cultural beliefs and practices, as well as variables regarding ECE provider knowledge, attitudes, motivation and training regarding parent engagement, which may be linked to the perceptions and practices we measured. Relatedly, we are unable to tease apart the experiences parents were having due to differences in individual teachers' efforts to engage them versus center-wide policies for parent engagement. This shortcoming of the measurement instruments could in part account for the small effect sizes we obtained, but the consistency of the findings despite these

measurement flaws point to the value of considering ECE practices to engage parents and parent engagement in ECE settings as potential levers to bolster children's school readiness skills. Moreover, this limitation is common in other preschool samples that measure parent engagement (e.g., Head Start FACES), and more broadly points to the need to develop better, more comprehensive measures of parent engagement. Longitudinal studies that assess a wider variety of ECE engagement practices and parent ECE engagement than were available in our sample at multiple time points across socioeconomically diverse families could help researchers identify the direction of effects of ECE practices and parent responses to those engagement practices. Fourth, despite our rich set of control variables, we cannot rule out selection effects, as those families who have the ability, time, comfort, and interest to engage in ECE settings may be the same families who also invest in home learning activities and choose centers that encourage parent engagement. Finally, like most research in this area, our study focused on mothers given the available data. We clearly need more research on early school engagement and school readiness that focuses specifically on fathers, or fathers and mothers together.

Implications for Policy, Practice and Research

The findings from this nationally representative sample of preschool children in center-based care point to the relevance of parent involvement in ECE settings for children's kindergarten readiness. Although given the correlational nature of our study we are unable to pinpoint who is driving this involvement, parents or ECE providers, our findings indicate that there are spillover effects between preschool learning activities at the center and learning activities at home, and this spillover helps explain differences in kindergarten language and reading school readiness skills. We failed to find any connections between parent school involvement in ECE centers or the quantity of engagement in home learning activities and

children's early math scores, suggesting that children may benefit from explicit focus on math-related activities as part of parent engagement strategies and activities. Further, the findings highlight how both the quantity and quality of parent engagement in home learning promote children's acquisition of kindergarten readiness skills, and point to an ECE-based pathway to promote the quantity of home learning activities.

Some pathways linking ECE and home experiences were stronger for children from lower income households, suggesting that ECE engagement strategies and parent involvement in ECE settings, may contribute in small ways to reducing early socioeconomic achievement gaps. These findings point both to barriers and opportunities to strengthen ECE-home connections to promote kindergarten readiness, especially for children from lower-income families. For example, many low-income parents may lack the instrumental resources (e.g., flexible work schedules, transportation), confidence and comfort to participate in school engagement activities in the ECE center, such as volunteering and attending meetings, that could impact their home learning engagement. ECE providers may need to find other ways to involve economically disadvantaged parents and/or to reach those parents in ways that may improve the amount of parent engagement in home learning activities. Communicating why and how parental school involvement in ECE settings can help children gain kindergarten readiness skills, that is by linking home and school learning activities, may motivate both teachers and parents to engage with each other in home and ECE settings.

The lack of links between ECE practices and parent school engagement in ECE settings and the quality of home learning activities highlights a critical area for practice. Targeted interventions have been shown to improve the quality of parents' home learning activities (e.g., Landry et al., 2012), and perhaps some of these directed strategies could be incorporated into the

practices ECE providers use to engage and educate parents, including embedding engagement activities while parents are participating with their children at the ECE centers. Notably, “suggestions for home learning” was the ECE engagement activity the smallest percentage of parents reported ECE providers were “doing well” (see Table 1), which suggests that this is an area that requires professional development in many ECE centers. Relatedly, given the relatively modest correlation between the quantity and quality of home learning activities, it will be important to identify ways in which messages regarding quantity are linked with tips for effective quality practices. Further, both researchers and practitioners should consider how to measure and connect some of the other ways in which parents may be engaged in home learning, such as culturally influenced activities and socialization practices (McWayne & Melzi, 2014) that present opportunities to build on family strengths to align home and ECE contexts to support early learning.

Given that parent engagement has become an indicator for many QRIS and other regulatory and accreditation systems, our study findings suggest that there is value in including family engagement as an indicator of quality, but the indicators of parent engagement may need to be expanded to include both what teachers and providers are doing to communicate with and engage parents, and what parents are doing to be involved in school. Beyond simply adding parent engagement as a quality indicator, our findings suggest that the potential benefits for children of parent engagement and parental school involvement in ECE settings may be via activities in the home environment, and thus professional development tied to QRIS systems can be geared towards understanding why these links exist, and what teachers can do to better align home and school learning. This reflection and professional development can include problem solving around why parents do and do not engage in their child’s center-based preschool,

including being sensitive and attentive to the stressors and the explicit and implicit messages regarding their roles that low-income families may experience. As we accumulate more research findings on the importance of family engagement for children's academic skills, the professional development that is coupled with QRIS must give teachers and center directors the tools they need to learn about families, and engage families as children's first teachers.

This study also suggests additional research is needed in several areas to inform practice and policy. For example, given the lack of consistent links between ECE engagement practices, and parent engagement in ECE and home settings, and the consistent positive links between home learning and kindergarten readiness, we need more detailed information on a) what specific knowledge and skills parents gain during different types of involvement in ECE centers, b) the factors that facilitate or hinder parents' use of the knowledge and skills acquired from ECE experiences, and c) the types of parent engagement that are linked to children's school readiness, particularly among socioeconomically diverse families. We need additional experimental studies that examine how ECE providers can increase parent engagement across settings in order to inform and guide evidence-based practices and policies. This is a strong need given increasing emphasis on parent engagement in measures of child care quality and in legislation (e.g., CCDBG, 2014) without more specific information regarding what engagement includes. Further, given that we cannot identify the direction of effects in our study, an alternative, yet important implication for practice is that parents who are more engaged at home are also more engaged at school, and deliberately select child care centers that encourage this engagement. This suggests we need to learn more about how to engage parents who may be uninvolved in learning activities both at home and at school, and how ECE providers can increase parent engagement across settings. Finally, we also need more research to understand how ECE providers and parental experiences

in the ECE setting can be leveraged to bolster the quality and consistency of home learning experiences. This line of research should include measures of parents' and ECE teachers' knowledge, beliefs and motivation for parent engagement and center-wide policies and curricula.

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Figure 1. Conceptual Model

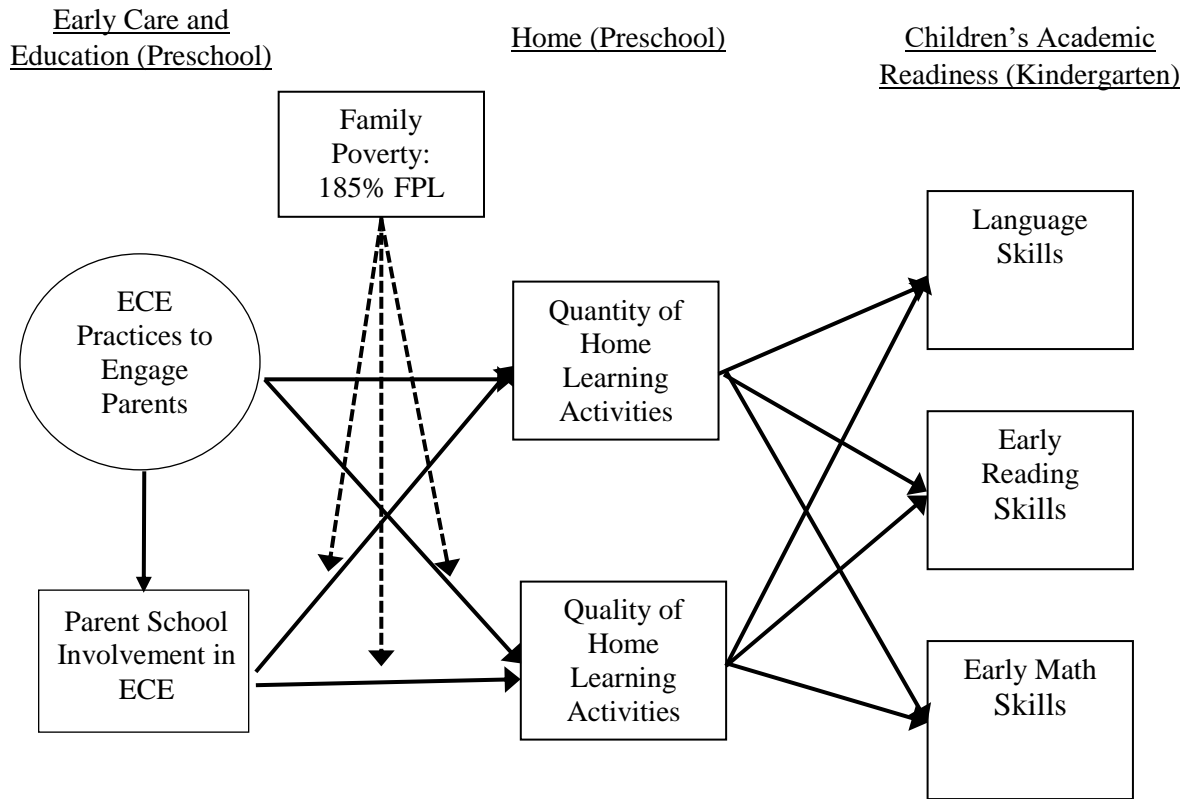
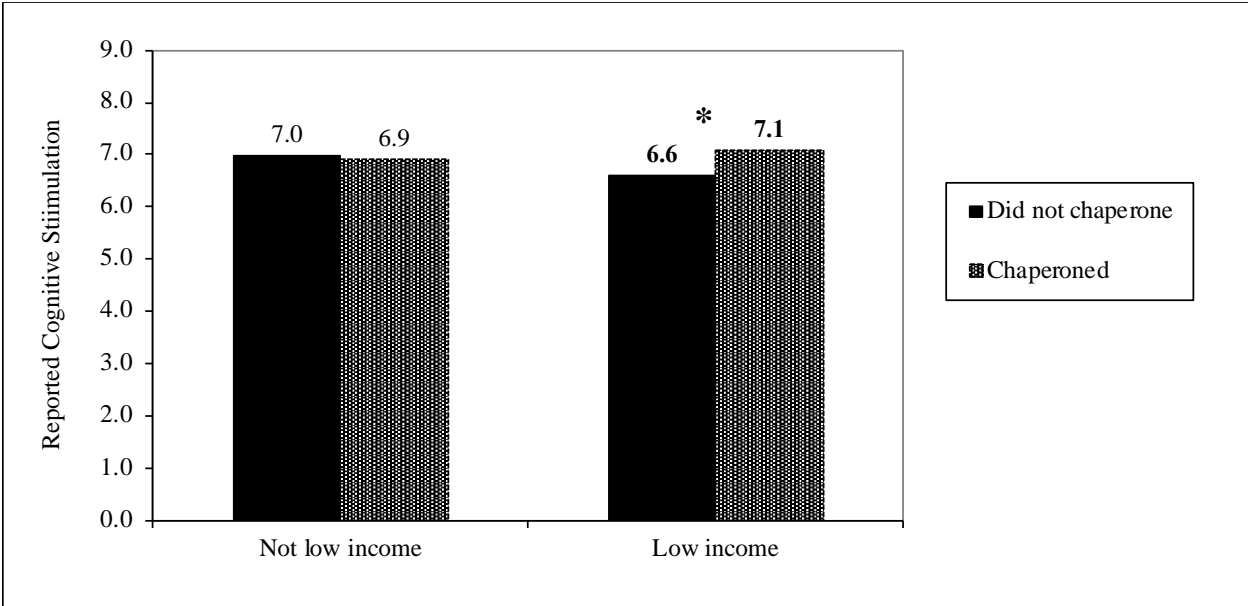
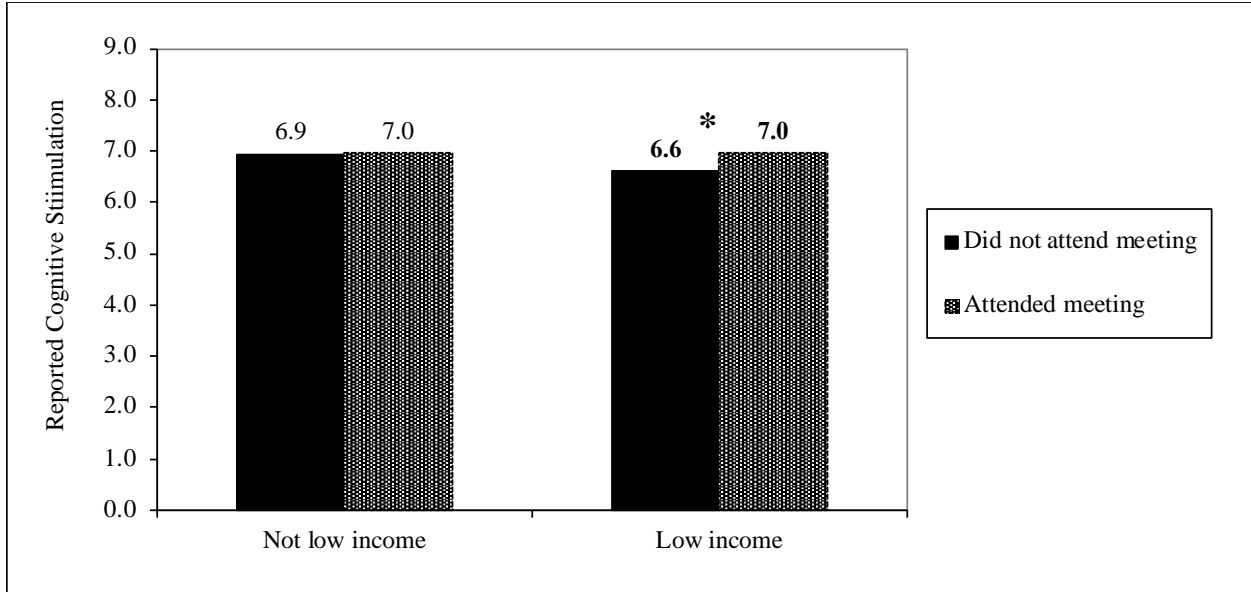


Figure 2. Interaction between income and chaperoning on parent reported cognitive stimulation



Note. Asterisk denotes significant difference between groups.

Figure 3. Interaction between income and attending a general meeting on parent reported cognitive stimulation



Note. Asterisk denotes significant difference between groups.

Table 1. *Weighted sample descriptives from preschool wave and focal study variables*

	<i>M/%</i>	<i>SD</i>
Child characteristics		
Male	50.92%	
Race		
White	64.13%	
Black	28.82%	
Hispanic	32.19%	
Asian	4.57%	
Low birthweight	18.98%	
BMI	16.64	2.17
Child has disability	27.25%	
No. of non-parental care arrangements	2.82	0.43
Hours/week in care	25.85	16.02
Attended Head Start	17.25%	
Family/household characteristics		
English is primary language	72.01%	
Family is in low income (1 = at or below 185% of FPL)	44.20%	
Mother has < HS education	15.45%	
Mother is married	62.10%	
Mother is employed 30+ hours	44.25%	
Household size	4.48	1.29
Residential father	62.36%	

Focal study variables

ECE parent engagement practices: “Does it well”

How child doing in school	71.22%
What children are like at this age	58.39%
Volunteer opportunities	63.13%
Suggestions for home learning	52.82%

Parent engagement in ECE (1 = yes)

Went to a scheduled conference	52.21%
Attended a general meeting	76.52%
Attended a class event	44.62%
Volunteered	38.08%
Chaperoned	26.81%

Parent engagement in home learning activities: “Everyday”

Read books	44.50%	
Tell stories	32.45%	
Sing songs	49.50%	
Reported quantity of home learning activities (scale of 3-12)	9.02	1.94
Observed quality of home learning activities (scale of 1-7)	4.04	1.39

Kindergarten academic readiness

Language	3.50	0.75
Pre-reading IRT scale score	45.06	14.12
Pre-math IRT scale score	44.51	9.95

Table 2. *Bi-Variate Correlation Matrix of Key Study Variables*

	Attend Conference	Attend Meeting	Class Event	Volunteer	Chaperone	Quantity Home Learning	Quality Home Learning	Language	Early Reading	Early Math
Attend Conference	--									
Attend Meeting	0.32***	--								
Class Event	0.28***	0.25***	--							
Volunteer	0.21***	0.25***	0.31***	--						
Chaperone	0.18***	0.17***	0.32***	0.37***	--					
Quantity Home Learning	0.03	0.10***	0.10***	0.15***	0.10***	--				
Quality Home Learning	-0.03	0.05**	0.09***	0.12***	0.07***	0.22***	--			
Language	-0.04*	0.03***	0.09***	0.07***	0.06***	0.16***	0.16***	--		
Early Reading	0.01	0.08***	0.14***	0.07***	0.06***	0.18***	0.20***	0.35***	--	
Early Math	0.02	0.08***	0.16***	0.10***	0.09***	0.17***	0.22***	0.37***	0.80***	--

Table 3. Standardized Coefficients Representing Direct and Interaction Effects on Parent Engagement in the Home and Kindergarten Academic School Readiness

	Parent Involvement in ECE					Home Learning		Kindergarten Readiness		
	Attend Conferece	Attend Meeting	Class Event	Volunteer	Chaperone	Reported Quantity	Observed Quality	Language	Early Reading	Early Math
Direct Effects	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)
Baseline										
Child Sex ^a	-.03 (.06)	-.05 (.06)	.01 (.06)	.02 (.06)	.07 (.06)	-.19 (.05)***	.04 (.06)	-.06 (.06)	.04 (.05)	.12 (.05)*
English Primary Language	-.45 (.17)	-.15 (.15)	.19 (.17)	.30 (.20)	.08 (.19)	.10 (.20)	.59 (.16)***	.50 (.13)***	.16 (.12)	.13 (.11)
2-year-old										
Reported Quantity of Home Learning	--	--	--	--	--	.44 (.02)***	.09 (.03)**	.02 (.03)	-.02 (.03)	.01 (.03)
Observed Quality of Home Learning	--	--	--	--	--	.09 (.03)**	.16 (.03)***	.13 (.03)***	.04 (.03)	.06 (.03)*
Preschool										
Maternal Depression	.02 (.03)	.01 (.03)	-.01 (.03)	.04 (.03)	-.05 (.03)	-.05 (.02)*	.02 (.02)	.03 (.03)	.03 (.03)	-.01 (.03)
Maternal Education	.03 (.02)	.06 (.02)**	.07 (.02)**	.07 (.02)**	.06 (.02)**	.05 (.02)**	.12 (.02)***	-.02 (.02)	.04 (.02)*	.03 (.02)

	Parent Involvement in ECE					Home Learning		Kindergarten Readiness		
Maternal Employment	.04 (.04)	-.02 (.04)	.04 (.04)	-.10 (.04)*	-.07 (.04)	.02 (.03)	.03 (.04)	-.02 (.04)	.03 (.03)	.01 (.03)
Weekly Hours in ECE Care	.03 (.04)	.01 (.04)	.03 (.04)	-.01 (.04)	-.02 (.04)	.04 (.03)	-.01 (.04)	-.05 (.04)	.03 (.02)	-.01 (.03)
Head Start (vs. other ECE)	.24 (.14)	.08 (.15)	-.11 (.14)	.04 (.11)	-.04 (.14)	.26 (.11)*	.04 (.13)	.01 (.12)	-.06 (.13)	.03 (.13)
Teacher:child ratio	-.02 (.04)	.02 (.04)	-.04 (.04)	-.01 (.04)	-.06 (.04)	-.03 (.03)	-.07 (.04)*	.09 (.04)**	.10 (.04)**	.09 (.03)**
Low income	-.05 (.08)	-.19 (.08)*	-.15 (.09)	-.13 (.08)	-.13 (.09)	-.04 (.07)	-.05 (.08)	-.14 (.08)	.09 (.07)	.03 (.06)
ECE Engage Practices	.31 (.06)***	.17 (.04)***	.09 (.04)*	.25 (.05)***	.19 (.04)***	.12 (.04)**	-.02 (.04)	-.02 (.04)	-.01 (.04)	.01 (.04)
ECE Engage*Income	--	--	--	--	--	.06 (.09)	.07 (.08)	.08 (.07)	.02 (.04)	.07 (.07)
Attended conference	--	--	--	--	--	-.04 (.03)	-.01 (.03)	-.01 (.03)	-.02 (.03)	-.01 (.03)
Attended general mtg.	--	--	--	--	--	.06 (.03)*	.05 (.03)	.02 (.03)	-.02 (.03)	-.01 (.03)
Attended class event	--	--	--	--	--	.01 (.03)	-.01 (.03)	.01 (.03)	.06 (.03)	.03 (.03)
Volunteered	--	--	--	--	--	.07 (.04)	.03 (.03)	.03 (.03)	-.03 (.03)	.01 (.03)

	Parent Involvement in ECE					Home Learning		Kindergarten Readiness		
Chaperoned	--	--	--	--	--	.03 (.03)	-.01 (.03)	.02 (.03)	-.01 (.03)	.05 (.03)
Conf*income	--	--	--	--	--	-.03 (.04)	-.06 (.04)	-.08 (.04)* ¹	-.05 (.04)	-.01 (.04)
Event*income	--	--	--	--	--	-.01 (.04)	-.04 (.04)	.05 (.03)	.07 (.03)* ²	-.04 (.03)
Volunteer*income	--	--	--	--	--	.02 (.04)	.02 (.04)	-.01 (.03)	-.04 (.03)	-.04 (.03)
Chaperone*income	--	--	--	--	--	.07 (.02)*	.05 (.03)	.03 (.03)	-.03 (.03)	.05 (.03)
Meeting*income	--	--	--	--	--	.14 (.05)**	.05 (.05)	-.08 (.05)	-.01 (.05)	-.01 (.04)
Reported quantity of home learning	--	--	--	--	--	--	--	.11 (.03)***	.11 (.03)**	.06 (.03)
Observed quality of home learning	--	--	--	--	--	--	--	.06 (.03)*	.09 (.03)**	.12 (.03)***
Preschool language	--	--	--	--	--	--	--	.21 (.02)***	-.03 (.02)	.03 (.02)
Preschool early reading	--	--	--	--	--	--	--	.12 (.04)***	.35 (.03)***	.14 (.03)***
Preschool early math	--	--	--	--	--	--	--	.05 (.03)	.20 (.04)***	.38 (.03)***

Note. Covariates not shown include child race/ethnicity, health, father presence, household size, ratio of child:adult directed activities, teacher-child conflict and closeness and center license/accreditation status.

^a male = 0; female = 1; ^b above = 0; at or below = 1; * $p < .05$ ** $p < .01$ *** $p < .001$; ¹Slopes were not significant; ²Interaction was outside the regions of significance; Model fit: CFI = .834; RMSEA = .018 (.017 - .020); WRMR = 1.02

Table 4. *Standardized Regression Coefficients Representing Significant Indirect Effects on Kindergarten Academic School Readiness*

	Language	Early Reading	Early Math
	β (SE), [C.I.]	β (SE), [C.I.]	β (SE), [C.I.]
ECE Engage \rightarrow Reported quantity of home learning	.011 (.005) [.002 - .022]	.012 (.006) [.001 - .025]	--
ECE Engage \rightarrow Volunteer \rightarrow Reported quantity of home learning	.002 (.001) [.001 - .002]	--	--
Volunteer \rightarrow Reported quantity of home learning	.010 (.005) [.002 - .020]	.011 (.005) [.002 - .021]	--
MeetingXIncome \rightarrow Reported quantity of home learning	.015 (.006) [.004 - .022]	.016 (.007) [.005 - .024]	--