Parenting Classes, Parenting Behavior, and Child Cognitive Development in Early Head Start: A Longitudinal Model

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Abstract

This study analyzed Early Head Start Research and Evaluation (EHSRE) study data, examining the effect of parenting classes on parenting behaviors and children's cognitive outcomes. The study analyzed three sets of dependent variables: parental language and cognitive stimulation, parent-child interactive activities, and the Bayley Mental Development Index (MDI) of children. The analysis results, using Longitudinal Hierarchical Linear Modeling (HLM) and multivariate analyses, revealed that parents who attended parenting classes stimulated their children's language and cognitive development and provided educational activities more than did parents who did not participate in parenting classes. The cognitive outcomes (the Bayley MDI scores) of the children whose parents attended parenting classes were significantly higher than those of the children of parents who had never attended these classes.

Key Words: Early Head Start, parenting classes, behavior, child cognitive development, longitudinal model, mothers, preschool, parent-child interactions

Introduction

Parental involvement in children's education has been an important issue because it is a critical resource for children's success in school. Research has consistently indicated that parental involvement relates positively to school

achievement. Many educational practitioners are making an effort to evoke parents' involvement in parenting workshops, volunteering in class activities, or various other opportunities. These efforts lead to better behavioral and academic outcomes for children (Bailey, Silvern, & Brabham, 2004; Flouri, 2004; Li, 2006; Reutzel, Fawson, & Smith, 2006; Senechal, 2006; St. Clair & Jackson, 2006; Sy & Schulenberg, 2005; Yan & Lin, 2005). Early studies on parental involvement in preschool programs have also indicated its benefits on children's cognitive and social development. When mothers participated in a program to improve verbal interaction, preschool children of low-income families showed significant cognitive development (Madden, Levenstein, & Levenstein, 1976); when mothers participated in parent-child intervention programs, 1- or 2-year-old toddlers displayed substantially improved cognitive development (Bronfenbrenner, 1974). Pfannenstiel and Seltzer (1985) also showed that preschoolers whose parents participated in a parent education program displayed significantly higher intelligence, language ability, and social development.

The findings of early studies substantiated the importance of intervention programs that first encourage parents to participate in parental education programs and later guide them in daily practice of their gained knowledge and skills to promote their children's cognitive and social development. Despite the proven importance of parent education, recent studies on the effects of parental classes in preschool or childcare programs have been under-represented. Moreover, research on the impact of parenting classes for children who are preschool age or younger have been less studied than those for school-age children.

This study examines the effects of parental involvement for infant and toddler preschoolers from low-income families by using Early Head Start (EHS) data. EHS constitutes a nationally representative dataset which contains variables of various family backgrounds and types of parental involvement. Among the types of parental involvement, we particularly paid attention to the effects of parenting classes on parental language and cognitive stimulation, parent-child interactive activities, and children's cognitive outcomes.

The study was guided by the following research hypotheses:

- The parents who participated in parenting classes from EHS would demonstrate more parental language and cognitive stimulation, as measured by home observation and by video recording, than those who did not.
- The parents who participated in parenting classes from EHS would demonstrate more parent-child interactive activities than those who did not.
- The children of parents who participated in parenting classes from EHS would demonstrate higher scores on the cognitive evaluation.

Theoretical Background

Parental Involvement and Parenting Classes

Early studies on preschool programs emphasized parental involvement on the basis of its benefits for preschool children's cognitive development. Bronfenbrenner (1974), in a review paper based on nine empirical studies examining parent-child intervention programs, asserted that intervention programs encouraging parental involvement led to substantial cognitive development of toddlers and preschool children. Bronfenbrenner also highlighted the importance of a parent intervention program when children are very young by showing that gains in children's IQ from the effects of parent intervention programs were highest when the children were one or two years of age, while the effects were weak if children were as old as five years.

In a similar vein, Madden et al. (1976) showed significant cognitive development of preschool children from low-income families after two years of their mothers' engagement in a verbal interaction modeling program. Specifically, through this intervention, mothers were taught to interact verbally while playing with their children to promote the children's intellectual and socioemotional development. Pfannenstiel and Seltzer (1985) also found that preschoolers whose parents participated in a similar parent education program (Parents as Teachers) showed, at the end of the program, significantly higher intelligence, language ability, and social development in comparison with national norms. Parents in the program learned how to facilitate the cognitive, social, linguistic, and physical development of their children from the time of prenatal development to the age of three.

Similarly, recent studies have evidenced the positive effects of Parents as Teachers (PAT) Programs on a large scale (Pfannenstiel, Seitz, & Zigler, 2003; Zigler, Pfannenstiel, & Seitz, 2008). Pfannenstiel et al. (2003) studied a PAT program for 2,375 public kindergarten school children in the state of Missouri. The program in their study was designed in such a way that PAT-certified educators taught parents to build knowledge according to their children's developmental stages and to highlight the importance of parental involvement to build solid parent-child relationships. The unique feature of their PAT program was a home visit and customized program component to cater to the needs of individual children. For example, the educators partnered with parents to promote better understanding of various children's developmental issues and to provide solutions for them. The PAT program was successful in helping parents, especially from low-income families, and in getting their children ready for school. Parents who attended the PAT program were more actively engaged in promoting their children's cognitive development: they read books to their

children more frequently and enrolled their children more in preschool programs than did those who had not been in the PAT program.

Zigler et al. (2008) extended their earlier study of the PAT program by collecting longitudinal data on 5,721 children's school performance from kindergarten to third grade. The authors confirmed the positive effect of the PAT program on children's school readiness and academic performance at third grade. Furthermore, parents who attended the PAT program demonstrated a great deal of improvement in parenting practices, which was important for influencing school readiness and the academic performance of their children. Also, combined with a quality preschool program, the PAT program was effective in narrowing the gap between poor and affluent children in terms of school readiness and academic performance.

Contrary to the results of the studies cited above, some studies have not indicated the same positive effects. Specifically, even the above-mentioned programs did not consistently show the same results. For example, when Madden, O'Hara, and Levenstein (1984) examined the effects of a mother-child verbal interaction program at a three-year, post-program evaluation, they could not find the same significant cognitive child development that their earlier study found. Furthermore, when Scarr and McCartney (1988) implemented in Bermuda the same verbal interaction modeling program previously used by Madden, O'Hara, and Levenstein, they were not able to find a significant effect on preschooler cognitive development, even immediately after the program. Similarly, when Owen and Mulvihill (1994) evaluated the Parents as Teachers program using a statistically robust method—a quasi-experimental longitudinal design—they reported no significant difference in children's outcomes between experimental and control groups. On the same note, based on their analysis of previous early intervention research, White, Taylor, and Moss (1992) concluded that there was no compelling evidence to prove the significant effects of parental involvement. Instead, they called attention to a need for a specific direction in parental involvement and a systematic exploration regarding which kinds of parental involvement are effective for which children.

Recent studies relating to parental involvement have diverged from early studies that focused on the effects of parent classes for children with behavior problems from lower socioeconomic status (SES) backgrounds. Many studies have been conducted to examine the effects of a parenting class based on the Incredible Years Program and have found a positive effect on decreasing behavior problems. The Incredible Years offers 12 weekly parent classes and teaches parents how to discipline and parent children, in addition to promoting children's social skills. By implementing the Incredible Years for parents with low income, Gross et al. (2003) found that toddlers whose parents attended parent

classes showed a greater improvement in their behaviors when compared to other toddlers whose parents did not attend. Also, by extending the Incredible Years Program to two more years to promote a better transition from preschool to kindergarten, Webster-Stratton, Reid, and Hammond (2001) showed a greater conduct improvement both at home and in school among children of mothers who attended parent classes. Hartman, Stage, and Webster-Stratton (2003) implemented advanced components, teaching interpersonal communication and problem-solving skills along with the basic components of the Incredible Years Program, to serve parents of children with behavior and/or attention problems. The authors found that children whose parents attended parent classes decreased their conduct and/or attention problems. When the Incredible Years was implemented in England, Jones, Daley, Hutchings, Bywater, and Eames (2007) found that preschoolers with both conduct and attention problems showed greater improvement if their parents attended parent classes, when compared to other preschoolers.

Similar to the Incredible Years Program, another clinical parenting class program has proved to have similar positive effects on improving conduct disorders in children. The Parenting the Strong-Willed Child (PSWC) class offers six weekly sessions and teaches principles and strategies for parenting children with conduct disorders. By providing the PSWC program to parents of children with behavior disorders, Conners, Edwards, and Grant (2007) reported that children showed less intensity and frequency of disorders in comparison with other children whose parents did not attend the classes. By referring to other empirical studies that showed the same positive effects of a PSWC class, Long (2007), who developed the PSWC program, reported the benefits of these clinical parent classes. Beyond discussing current trends in parenting classes, Long also emphasized the need to benefit "average" parents who do not have children with serious problems.

Parental Involvement in Head Start

Since 1965 when Head Start was launched for the first time, parental involvement has been a critical factor in the program's success. The Head Start Program Performance Standards, which are mandatory for these programs, require parent participation in multiple ways, such as policymaking and operations, curriculum development, parenting classes, home visits, and volunteering in the classroom (Head Start Bureau, 1998). Because Head Start believes that parents are the primary and most important resources to support children's development and learning, the regulation requires that

> Head Start agencies must provide opportunities for parents to enhance their parenting skills, knowledge, and understanding of the educational

> and developmental needs and activities of their children and to share concerns about their children with program staff. [Head Start Program Performance Standards 1304.40 (e) (3)]

While the regulation requires Head Start facilities to provide opportunities for parental involvement in the program, it also allows each program autonomy in planning and implementing parental involvement to meet the different needs and goals of the children and families involved in the program [Head Start Program Performance Standards 1304.40 (a)]. Parenting classes are one of the common types of parental involvement in Head Start. These classes cover various topics, such as early childhood education curriculum, behavior guidance, health and nutrition, preventing violence, early literacy skills and activities, and transition to kindergarten (Head Start Bureau, 1993).

The implementation of Early Head Start (EHS) was largely attributed to the studies of brain functioning for infants and toddlers during the 1980s and 1990s and their emphasis on the importance of cognitive development of young children. In particular, a Carnegie Corporation research report, "The Quiet Crisis," strongly influenced the launch of EHS by warning, "American children under the age of three and their families are in trouble, and their plight worsens everyday" (1994). In response to this report, it was recommended that the Advisory Committee on Head Start Quality and Expansion be established to serve families with children under the age of three. Later, Congress expanded EHS to serve pregnant women and low-income families with infants and toddlers (Early Head Start, 2000). Like Head Start, Early Head Start also mandates parental involvement but gives local programs leeway in planning and implementation.

Methods

Analyses

The main statistical tools for this study were a two-level longitudinal hierarchical linear modeling (HLM) and a multivariate analysis. The HLM analyzed the longitudinal effects of parenting classes on parental cognitive stimulation and children's cognitive development (Bayley MDI scores) after controlling for the effects of the other covariates using three waves of data. The multivariate analyses examined the effects of parenting classes on the parental cognitive and language stimulation and the parent-child interactive activities at 36 months of age.

Multilevel analysis, also referred to as hierarchical linear modeling (HLM), is a statistical methodology for examining hierarchical or nested data. For example, children who are nested in a particular school tend to have more aspects

in common than do children from different schools. Multilevel analysis takes into account correlations caused by sharing common factors among children in the same school (Hox, 2002; Raudenbush & Bryk, 2002). Analyzing longitudinal data through a multilevel analysis offers researchers great advantages. This approach has been shown to overcome several methodological limitations associated with traditional repeated measures designs: it is free from the strong assumption (compound symmetry) of repeated measures; it allows for unbiased parameter estimation, even when the data show a high degree of correlation within the levels; and it is highly flexible with respect to the number and spacing of observations, in the sense that it does not require equal spacing or an equal number of observations. This flexibility makes longitudinal multilevel analysis a breakthrough when it comes to the handling of missing data, which has been a major problem for longitudinal data analysis (Hox; Kreft & de Leeuw, 1998; Lee, 2000; Raudenbush & Bryk).

The two-level HLM models were analyzed using the two longitudinal models: In the first longitudinal model, the association of the three waves of parenting classes and the composite score of parental cognitive stimulation was examined; in the second longitudinal model, the relation between the three waves of parenting classes and children's MDI scores was explored. We used the three waves of parenting classes by specifying the variable as a time-varying variable. In this way, we were able to examine the direct effect of parenting classes on dependent variables as well as the longitudinal effect.

The HLM model at level-1 measured the initial score and change (growth) rate of a dependent variable, and the longitudinal effect of a parenting class on the dependent variable. Level-2 was designed to show the interaction effects of the individual variables with the change rate of a dependent variable and a parenting class (*ParClass)* only at the initial point (intercept). (See Appendix A for the detailed model specifications of level-1 and level-2; all Appendices available from the authors upon request; contacts are at the end of this article.)

The multivariate analyses were also adopted to examine the effects of parenting classes on the two forms of parental cognitive and language stimulation and the five parent-child interactive activities. The multivariate analyses were a suitable statistical tool due to multiple dependent variables and their correlated aspects (two types of parental cognitive and language stimulation and five parent-child interactive activities) within each set.

The two forms of parental cognitive and language stimulation were parents' language and cognitive stimulation by Home Observation for Measurement of the Environment (HOME) and parents' cognitive stimulation by video recording of parent-child interaction at 36 months of age. The five activities were measured as parent-child play, parent-child outside activities, reading once or more per day, reading bedtime routine, and reading frequency.

Data and Variables

This study used the Early Head Start Research and Evaluation (EHSRE) database, which contains a three-year, large-scale data, allowing for investigation of the longitudinal effects of parenting classes on parenting behaviors and children's cognitive development. In 1996, the Administration on Children, Youth, and Families (ACYF) initially funded 143 Early Head Start programs. Among those programs, only 17 programs were selected for an evaluation and included in the EHSRE to have a balance of rural/urban locations and racial/ethnic composition. The data collection method of the EHSRE was the random assignment of children and their families to the Early Head Start program (EHS) and to the control group at the onset of programs. While the EHS group received planned services, the children of the control group could not receive any services from Head Start until the child reached the age of 3, although they could receive other services in the community. At the design stage of evaluation, 1,513 families were assigned to the EHS, while 1,488 families were assigned to the control group. After an initial adjustment, the EHS data was composed of 1,503 children of the program group and 1,474 children of the control group (Inter-University Consortium for Political and Social Research, 2004).

As stated in the purpose of the study, the chief predictor was the degree of participation of mothers in parenting classes. The variable of parenting classes in the study indicated whether mothers attended parenting classes at 6, 15, and 26 months after enrollment. Although the EHSRE used random assignments for the Early Head Start programs, it did not employ random assignments with the parenting classes. As shown in Table 1, the frequencies of mothers who participated in parenting classes from the control and the EHS were quite different, but they showed constant participation rates over the time. We used the three waves of parenting class variables by specifying them as a time-varying variable. In other words, at each wave the effect of parenting classes was differently associated with the dependent variables, and those different associations revealed the longitudinal effect.

To reduce the selection bias for the effect of parenting classes, which was caused by non-randomization, we controlled for the effects of important predictor variables that could significantly influence the cognitive development of children: teenage status of the mother at random assignment (*Teenmom*), mother's education (*Momedu*), mother's primary language (*Momlang*), adult male in the household at baseline (*Madult*), mother's previous experience of Head Start programs (*PreHead*), family poverty level (*Povty*), child's gender (*Gender*), child's age at random assignment (*Age*), and the program status (*Hdst*).

Table 1. Frequency Table for Participants of Parenting Classes Classified by Three Waves and Program Status (EHS vs. Control Groups)

		Parenting Class		Total
		No	Yes	
6 months after enrollment in EHS	Control	827	182	1009
	EHS	613	461	1074
15 months after enrollment in EHS	Control	875	134	1009
	EHS	633	442	1075
26 months after enrollment in EHS	Control	872	138	1010
	EHS	687	384	1071

We analyzed three sets of dependent variables: parent's language and cognitive stimulation, parent-child interactive activities, and Bayley MDI scores. The first set of dependent variables, parent's language and cognitive stimulation, were used to explore the relation between parental education and the quality of parent-child interactions, which can be critical factors in promoting a child's cognitive development. The two raw scores (parent's language and cognitive stimulation as determined by home observation and by video recording) were used as dependent variables in the multivariate analyses. We also created a composite variable by combining the two variables for the longitudinal analysis. The composite variable was created by converting the two raw scores into standardized scores and combining them into one. As the second set of dependent variables, we used five parent-child interactive activities: parent-child play, parent-child outside activities, reading once or more per day, reading bedtime routine, and reading frequency at 36 months of age by specifying another set of dependent variables. Finally, we also paid attention to the Bayley MDI scores at the ages of 14, 24, and 36 months as dependent variables for a longitudinal analysis to examine the effects of parenting classes on the degree of children's mental development.

Results

Our data analysis included descriptive statistics and correlations to determine the bivariate relations among all variables in the first step. The total number of children in the EHS database was 2,977; the total number of mothers who participated in the study was 2,960. Among those, 643, 576, and 522 mothers participated in the 6-, 15-, and 26-month parenting classes, respectively (See Table 1 for detailed information). When we looked at the total

number of participants, 665 mothers from the program and 300 mothers from the control group participated in one or more parenting class.

As a preliminary analysis, we also performed a bivariate correlation whose results revealed that parenting classes had significant connections with a child's cognitive development indices, justifying the importance of further advanced analyses. The correlation of parenting classes with Bayley MDI at 36 months was 0.127 ($p < 0.01$), with home language cognitive stimulation being 0.169 ($p < 0.01$), and with parent cognitive stimulation being 0.121 ($p < 0.01$), as shown in Table 2.

Table 2. Descriptive Statistics and Correlation Coefficients of Parenting Classes and All Nine Dependent Variables at 36 months

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Parenting Class	—	.127**	.169**	.121**	.106**	.057*	.126**	.136**	.133**
2. Bayley MDI Score		—	.364**	.277**	.133**	-.033	.159**	.197**	.222**
3. HOME: Language & Cognitive Stimulation			—	.296**	.383**	.169**	.288**	.357**	.440**
4. Video: Parent Cognitive Stimulation				—	.129**	.056*	.146**	.132**	.172**
5. Parent-Child Play					—	.389**	.231**	.555**	.691**
6. Parent-Child Outside Activities						—	.083**	.203**	.256**
7. Reading Bedtime Routine							—	.410**	.384**
8. Read Daily								—	.817**
9. Reading Frequency									—
N	2081	1658	1861	1658	2076	2061	2099	2072	2072
Mean	.25	90.63	10.49	3.77	4.36	2.86	.31	.54	4.53
SD	.434	12.634	2.018	1.125	.850	.702	.462	.498	1.143

* $p < 0.05$; ** $p < 0.01$

The second analysis was on the longitudinal effect of parenting classes on the composite score of parental cognitive and language stimulation. The effect was significant, having the coefficient of 0.246 ($p < 0.01$) as shown in Table 3. In other words, when mothers participated in parenting classes, the mothers showed increased cognitive and language stimulation over the years.

Table 3. The HLM Analysis Result Using Composite Scores of Parental Cognitive and Language Stimulation at 14, 24, and 36 Months as Dependent Variables

Fixed Effect	Coefficient	SE	T-Ratio	DF	*p*
Initial Score	-2.442	0.166	-14.737	1096	0.000
Growth Effect	0.290	0.027	10.731	1105	0.000
Parenting Class Effect on Growth	0.246	0.061	3.996	2598	0.000

We performed additional analyses to examine the effects of parenting classes on the two separate measures of parental cognitive stimulation. The result of multivariate analysis presented in Table 4 indicates that the effects of parenting classes were pronounced for both HOME language cognitive stimulation ($F = 14.159$, $p < 0.01$) and video parent cognitive stimulation ($F = 12.483$, $p < 0.01$). Therefore, when mothers went to parenting classes, increased parental cognitive stimulations in parent-child interactions were noticed over time. This finding shares the observations from early literature (Bronfenbrenner, 1974; Madden et al., 1976). Specifically, our results verified the results of Madden et al. (1976), in which the authors showed that parents of low-income families demonstrated improved verbal interaction with children during play time when they attended an intervention program. In addition, our result is a new addition to the literature in terms of the longitudinal effects of parenting classes on the role of parental behavior in helping foster children's cognitive and language development. Figure 1 highlights the effect of parenting classes on parent cognitive stimulation by HOME, while Figure 2 displays the effect by video observation.

Figures 1 & 2. Relationships Between Parenting Classes and Language & Cognitive Stimulation by Observation and by Video Recording at 36 Months

Figure 1. HOME Observation

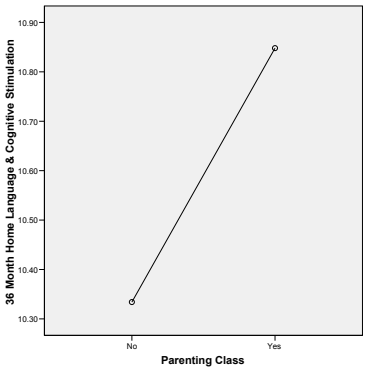


Figure 2. Video Recoding

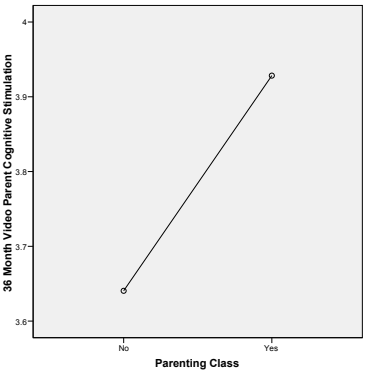


Table 4. The Multivariate Analysis Result Using Language and Cognitive Stimulation by HOME Observation and by Video Recording at 36 Months as Dependent Variables

Source	Dependent Variable	SS	df	MS	F	*p*	η^2
Parenting Class	H. L. & C. S.[1]	45.971	1	45.971	14.159	.000	.151
	V. L. & C. S.[2]	14.416	1	14.416	12.483	.000	.082
Error	H. L. & C. S.[1]	2636.386	812	3.247			
	V. L. & C. S.[2]	937.718	812	1.155			
Total	H. L. & C. S.[1]	3106.049	822				
	V. L. & C. S.[2]	1021.193	822				

[1]Home Language & Cognitive Stimulation
[2]Video Language & Cognitive Stimulation

In the next analysis, we paid attention to the effects of parenting education on parent-child activities. As Table 5 and Figures 3-7 show, the results of multivariate analysis demonstrate that participation in parenting classes resulted in a statistically significant increase in parent-child activities, with the exception of parent-child outside activity ($F = .125$, $p > 0.05$). Specifically, parent-child play ($F = 10.121$, $p < 0.01$; $\eta^2 = 0.031$), reading bedtime routine ($F = 17.272$, $p < 0.01$; $\eta^2 = 0.069$), reading daily ($F = 21.820$, $p < 0.01$; $\eta^2 = 0.060$), and reading frequency ($F = 20.918$, $p < .01$; $\eta^2 = 0.062$) showed significant results with effect sizes ranging from 0.031 to 0.069. Importantly, three reading activities showed significant relationships with parenting education, although the effect

sizes were small. Our Figures 3-7 also confirmed the multivariate results, with increased activities patterns when mothers participated in a parenting class, although careful interpretation is required because of their effect sizes.

Along with results on increased cognitive stimulation, the results of increased parent-child activities by those participating in a parenting class also support previous research findings (Bailey, Silvern, & Brabham, 2004; Bronfenbrenner, 1974; Senechal, 2006; Sy & Schulenberg, 2005; Yan & Lin, 2005).

Table 5. The Multivariate Analysis Results Using Parent-Child Activities as Dependent Variables at 36 Months

Source	Dependent Variable	SS	df	MS	F	*p*	η^2
Parenting Class	Parent-Child Play	7.262	1	7.262	10.121	.002	.031
	Parent-Child Outside Activities	.064	1	.064	.125	.724	.001
	Reading Bedtime Routine	3.550	1	3.550	17.272	.000	.069
	Read Daily	5.130	1	5.130	21.820	.000	.060
	Reading Frequency	26.785	1	26.785	20.918	.000	.062
Error	Parent-Child Play	741.907	1034	.718			
	Parent-Child Outside Activities	525.707	1034	.508			
	Reading Bedtime Routine	212.527	1034	.206			
	Read Daily	243.087	1034	.235			
	Reading Frequency	1324.024	1034	1.280			
Total	Parent-Child Play	765.944	1044				
	Parent-Child Outside Activities	531.084	1044				
	Reading Bedtime Routine	228.322	1044				
	Read Daily	258.712	1044				
	Reading Frequency	1411.680	1044				

Figures 3-7. Relationships Between Parenting Classes and Parent-Child Activities at 36 Months

Figure 3. Parent-Child Play

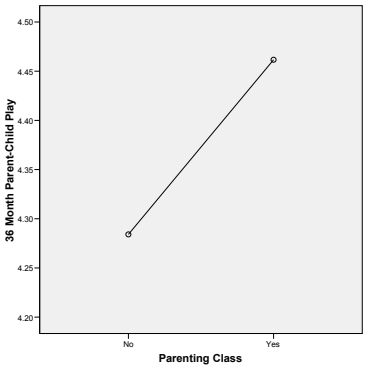


Figure 4. Parent-Child Ouside Activities

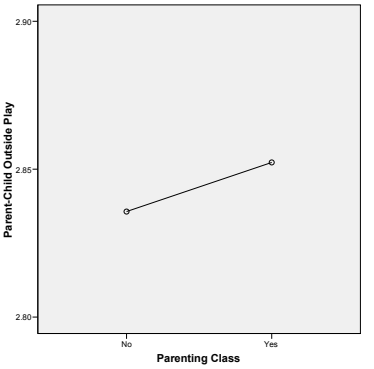


Figure 5. Reading Bedtime Routine

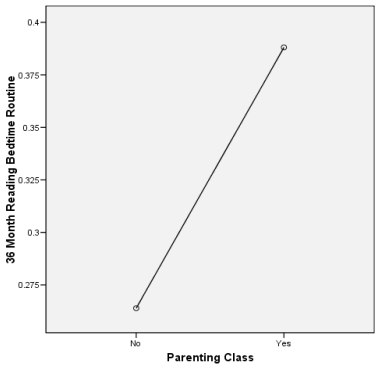


Figure 6. Read Daily

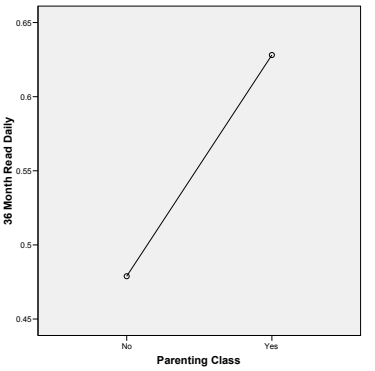
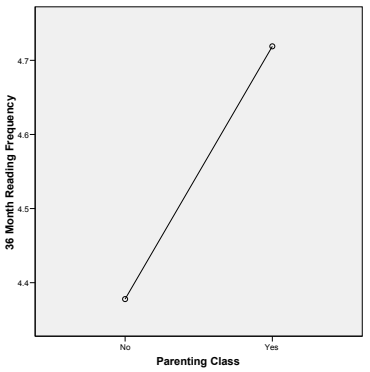


Figure 7. Reading Frequency



In the last analysis, we analyzed the effect of parenting classes on children's Bayley MDI scores using a longitudinal hierarchical linear modeling. Our analysis revealed that the children whose mothers had a parenting class demonstrated significantly higher MDI scores than those whose mothers had not gone to parenting class (β_{20} = 1.438, p < 0.05). To present a clear understanding, we present only the effects of the initial score, the growth rate, and a parenting class on children's Bayley MDI score in Table 6. The effects of other independent variables and the other statistical results of the full model are presented in Appendix B

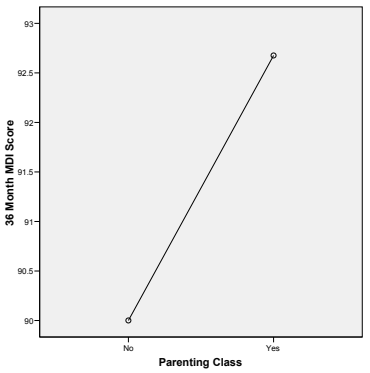
(all Appendices available from authors upon request). Figure 8 also illustrates the difference of children's Bayley MDI scores from the two parent groups.

Although this significant result is the final objective of providing parenting classes for the parents of low-income families, it takes extra caution to interpret the results because there may be other factors that determine improved cognitive development of children which we did not consider in the analysis. Despite our caution in asserting a direct association between the effects of parenting classes and children's cognitive development, this result shares similar findings with prior studies which showed parenting classes as being significantly associated with children's intellectual development (Bronfenbrenner, 1974; Madden et al., 1976; Pfannenstiel & Seltzer, 1985).

Table 6. The HLM Analysis Result Using Bayley MDI Scores at 14, 24, and 36 Months as Dependent Variables

Fixed Effect	Coefficient	SE	T-Ratio	DF	*p*
Initial Score	85.366	1.392	61.312	1109	0.000
Growth Effect	-3.589	0.248	-14.488	2566	0.000
Parenting Class Effect on Growth	1.438	0.567	2.537	2566	0.012

Figure 8. Relationship Between Parenting Classes and Child's MDI Score at 36 Mos.



Lastly, we paid attention to the effects of the variables we controlled for (covariates) in examining the effects of parenting classes on the three sets of dependent variables. As stated in the methods section, we controlled for the effects of the variables because they could influence the outcome variables and thus confound the effects of parenting classes. At the same time, they could be important variables to consider. Our analyses allowed us to see the results of the covariates along with the interpretation of parenting classes. For longitudinal and multivariate analyses for Bayley MDI scores, the effects of the teenage status of the mother (*Teenmom*), mother's education (*Momedu*), adult male in the household (*Madult*), and child's gender (*Gender*) were significant. High child Bayley MDI scores were observed when the mother was a teenager or had higher education; the child was a girl; or a male adult lived in the household. Both longitudinal and multivariate analyses for

parental cognitive stimulation indicated that the effects of the mother's teenage status (*Teenmom*), mother's education (*Momedu*), mother's primary language (*Momlang*), family poverty level (*Povty*), and child's gender (*Gender*) were significant. For the multivariate analysis using parent-child interactive play, the mother's education (*Momedu*) and mother's primary language (*Momlang*) were significant predictors as shown in Appendix C. The detailed information is presented in Appendices B and C (available from the authors upon request).

Discussion

Overall Findings

The long-term goal of this study is to provide sound, empirical research findings on the effects of active parental involvement in children's cognitive development and educational success for low-income families and to support parental outcomes and child well-being. Keeping the long-term goal in mind, the stated short-term objectives of the paper were to investigate the effects of parenting classes on parental cognitive and language stimulation, parent-child interactive activities, and children's cognitive development in Early Head Start participants. As Early Head Start has mandated multi-dimensional parental involvement, such as class volunteering, council meetings, staff-parent conferences, and parenting classes, the study considered parental involvement as an important determinant to change parental behavior and, in turn, to boost the cognitive development of children from low SES families. The study selected the effect of parenting classes as a main predictor variable among available variables of parental involvement. It was guided by prior research in which parenting classes made a direct impact on parental behaviors and children's cognitive development (Bronfenbrenner, 1974; Madden et al., 1976), but this type of investigation has been under-represented in recent research. The findings of our study can be summarized as follows: when compared to the parents who did not participate in parenting classes, those who attended parenting classes: (1) increased their children's cognitive and language stimulation over the years; (2) engaged in more parent-child activities such as parent-child play, reading bedtime routines, reading daily, and reading frequency; and (3) had children with higher scores in the Bayley assessment over the three waves.

As shown in the summary of our findings, we supported all three hypotheses with our analysis results, although they show small effect sizes. Thus, our study mirrored prior studies in which participation in a parental education program had a favorable outcome (Bronfenbrenner, 1974; Madden et al., 1976; Pfannenstiel & Seltzer, 1985), although there exists a difference in the impact of the program effects. In interpreting our findings, however, we were careful not to

make a direct cause-effect link, considering that our results are based on survey questionnaires. Although we tried to control for many possible extraneous variables in the study (the teenage status of the mother at random assignment, mother's education, mother's primary language, adult male in the household, mother's previous experience of Head Start programs, family poverty level, child's gender, child's age at random assignment, and the program status), there still exist many factors determining parental behaviors, parent-child interaction, and children's cognitive development. For example, self-selection would remain as a major confounding effect when examining the effects of parenting classes on those dependent variables. The strongly motivated mothers would naturally participate in the parenting classes; thus the motivation rather than the program effects may play a major role in increasing cognitive and language stimulation and parent-child interactions. Therefore, we are cautious about an interpretation that declares the improved outcomes of those dependent variables are due to the effect of parenting classes. Another limitation of this study is the reliance on self-reported data. The participation in parenting classes was a response in the parent interview. With self-reporting methods, a social desirability response bias is of particular concern. Therefore, we suggest that further study is needed to consider the effect of self-selection for parental involvement; we further suggest collecting the data by a means other than self-report.

It is also important to note that there may be many other psychosocial and contextual outcome factors that this study did not consider. Therefore, we recommend that the EHSRE collect child outcome data on pre-academic and behavioral competencies as well as other contextual variables; at the same time we suggest that future studies explore the effects of parenting classes on other psychological and social factors for mothers and children.

We also urge the EHSRE to include program factors from each local Early Head Start program, such as structure, curriculum, child-teacher ratios, parent involvement, teacher qualifications, training, and professional development. As we explained regarding its regulations, Head Start allows each local program autonomy in planning and implementing curricula, including parental involvement programs. Therefore, it is very important to consider the effects of different local programs in examining the effects of parental involvement to gain insights about important determinants for successful programs.

Despite the limitations, this study has important implications regarding potential benefits of parenting classes for both parents and children, especially those from low SES backgrounds. Therefore, this study suggests that an evaluation study of parenting classes for low-income families would be possible using an experimental design with direct causal-effect interpretation. Moreover, the practices and impacts of parenting classes for children who are preschool age

or younger have been relatively less studied than those for school-age children, although the importance of parental involvement has been emphasized more often than not. As Early Head Start staff recognizes parents as important resources for the education of children, it is important to encourage parents with young children to learn appropriate parenting skills and to help them maximize interactions with their children at home.

As Edwards, Pleasants, and Franklin (1999) have shown, young children learn not through academic activities such as paper-and-pencil tasks or rote memorization, but from parent-child interactions, including reading books, having open-ended conversations, singing songs, doing creative art projects, and pretend play. Thus, it is very important to have parents recognize the importance of play and learn to stimulate cognitive development in play scenes. Therefore, to conclude, the present study suggests that early childhood education programs should provide parenting classes for children's parents. In these classes, practical ideas about interacting with children, as well as the importance of parental roles in education, should be taught. The contents of parenting classes may include (1) the importance of positive interaction between parents and children, (2) how to play with children at home, (3) good activities for children's literacy and cognitive development, and (4) how to arrange the home environment to promote their children's development and learning. The more children gain exposure to cognitive stimulation in a preschool program and at home during early childhood, the more ready they will be for schooling later.

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