January 2006

Involvement in Early Head Start home visiting services: Demographic predictors and relations to child and parent outcomes

Helen Raikes
University of Nebraska-Lincoln, hraikes2@unl.edu

Beth L. Green
NPC Research, Portland OR, beth.green@pdx.edu

Jane Atwater
Juniper Gardens Children's Project, University of Kansas, janea@ku.edu

Ellen Kisker
Twin Peaks Partners,

Jill Constantine
Mathematica Policy Research,

See next page for additional authors

From Early Childhood Research Quarterly 21 (2006), 2–24

Involvement in Early Head Start home visiting services: Demographic predictors and relations to child and parent outcomes

Helen Raikes[1], *University of Nebraska-Lincoln*
Beth L. Green, *NPC Research, Portland, OR,*
Jane Atwater, *Juniper Gardens Children's Project, University of Kansas*
Ellen Kisker[2], *Twin Peaks Partners, LLC*
Jill Constantine, *Mathematica Policy Research, Inc.*
Rachel Chazan-Cohen, *Administration for Children and Families*

Abstract

One strand of home visiting research investigates efficacy while another investigates under what conditions programs achieve outcomes. The current study follows the latter approach. Using a within-program design in a sample of 11 home-based sites in the Early Head Start Research and Evaluation study, this study found that three components of home visits (*quantity* of involvement including number of home visits, duration in the program, length of visits and intensity of service; *quality* of engagement including global ratings of engagement by staff and ratings of engagement during each home visit; and the extent to which home visits were *child focused*) represented distinguishable aspects of home visit services. Demographic variables predicted components of involvement, and home visit involvement components were differentially related to outcomes at 36 months, after controlling for demographic/family factors and earlier functioning on the same measure. Only one *quantity* of involvement variable (duration) predicted improvements in home language and literacy environments at 36 months. *Quality* of involvement variables were negative predictors of maternal depressive symptoms at 36 months. Finally, the proportion of time during the visit devoted to *child-focused* activities predicted children's cognitive and language development scores, parent HOME scores, and parental support for language and learning when children were 36 months of age. Implications for home visiting programs and policies are discussed.

Keywords: Homevisit; Infant toddler; Early Head Start

1. Introduction

One prevailing view of home visiting programs discounts their efficacy (Chaffin, 2004) while another view finds support for program effects under *some conditions* or for some subgroups. Related to this latter view, some have

[1] Corresponding author. Tel.: +1 402 486 6504; fax: +1 402 486 6792. *E-mail address:* hraikes@neb.rr.com (H. Raikes). During the time of the Early Head Start Research and Evaluation Project, Dr. Raikes was Society for Research in Child Development Fellow and Consultant, Administration for Children and Families, U.S. Department of Health and Human Services.

[2] During the project, Dr. Kisker was a senior researcher at Mathematica Policy Research, Inc.

Published by Elsevier Inc. Used by permission. doi:10.1016/j.ecresq.2006.01.006

suggested that the important question may not be *whether* the programs work but *under what conditions* (Gomby, 1999; Sweet & Appelbaum, 2004). This approach suggests studying variations in the ways that parents are involved in the programs. However, for the most part, parent involvement variables tend not to be included in studies of home visiting programs (Gomby, Culross, & Behrman, 1999). In this study, we used data from 11 sites that participated in the Early Head Start Research and Evaluation Project, an experimental design study, to examine more closely the role of parent involvement in home visiting within the program group. The study operationalizes a conceptual model of home visiting for early childhood intervention programs provided by Korfmacher et al. (2005) and measures three components of parent involvement in home visiting services—quantity of involvement, quality of engagement, and visit content (the extent to which visits were child-focused). It examines specific variables that measure these components; examines demographic predictors of the variables; and relates these variables to child and family outcomes, both before and after controlling for key demographic predictors and earlier functioning on the child and family outcomes. Home visiting is a service delivery mode that serves substantial numbers of children and families in the United States today. Between a quarter and a half million preschool-age children and their parents were enrolled during 2004 in five of the largest programs serving families of young children through home visits (Early Head Start; Healthy Families America, HIPPY, Parents as Teachers, and the Parent Child Home Program; Home Visiting Forum, 2004). If for no other reason than because home visiting serves so many children and families, it is important to better understand under what conditions it is an effective service strategy.

1.1. Efficacy of home visiting programs

Some studies and reviews suggest that home visiting as a service delivery mechanism is generally not efficacious (Chaffin, 2004; Gomby, 1999) and that home visiting may not represent a viable early intervention option. However, a closer look at outcomes in home visiting programs shows favorable effects on a wide range of parent behaviors and, to some extent, on child outcomes. Effects on parents include improvements in maternal health and reduced subsequent pregnancies (Kitzman, Cole, Yoos, & Olds, 1997; Olds et al., 1998), increased parental reading to children (Johnson, Howell, & Molloy, 1993); greater reliance on non-violent discipline (Duggan et al., 1999; Heinicke, Fineman, Ponce, & Guthrie, 2001); greater verbal responsiveness and provision of stimulating activities (Black et al., 1994); increased sensitivity in interactions (Olds et al., 2002); greater emotional coherence and expressiveness (Olds et al., 2004); less intrusiveness and more support for autonomy (Heinicke et al., 2001); reduced domestic abuse (Duggan et al., 1999); in a population of clinically depressed mothers, reduced depressive symptoms (Gelfand, Teti, Seiner, & Jameson, 1996); decreased parental stress (Duggan et al., 1999); in a sample of substance-dependent mothers, reduced drug usage (Black et al., 1994); and less child maltreatment (Daro & Harding, 1999; Olds et al., 1997, 1998; Olds, Henderson, Kitzman, & Cole, 1995; Wagner & Clayton, 1999). In addition, the Early Head Start evaluation, the source of data for the current study, reported parents in home-based programs were more supportive in interactions with their children and had less parenting stress than control group parents when children were 36 months of age (Administration for Children and Families [ACF], 2002; Love et al., 2005).

Direct effects on children are less robust, perhaps in part because home visiting programs often initially target parents in order to have long term effects on children (Sweet & Appelbaum, 2004). However, some direct effects on children have also been found. These include reduced doctor/hospital visits for accidents and injuries (Kitzman et al., 1997); increased immunizations and improved nutrition (Johnson et al., 1993); among low birthweight babies, better health outcomes (Brooks-Gunn et al., 1994); fewer behavior problems (Aronen & Kurkela, 1996; Butz, Lears, & O'Neil, 2001); better emotional functioning (Heinicke et al., 1999; Jacobson & Frye, 1991; Van den Boom, 1995), and more secure attachment relationships (Heinicke et al., 2001; Lieberman, Weston, & Pawl, 1991). While multiple evaluations of home-based programs have not found child language/cognitive effects (Baker, Piotrkowski, & Brooks-Gunn, 1999; Wasik, Ramey, Bryant, & Sparling, 1990), outcomes in these domains have been reported in subgroups or specialized samples in rigorous studies (Beckwith, 1988; Black et al., 1994; Olds et al., 2002). The Early Head Start evaluation reported children in home-based programs were significantly better at engaging their parents during videotaped play activities than control group children. Within home-based programs that fully implemented the comprehensive Head Start Program Performance Standards (achieved high standards for quality and quantity of services aimed at enhancing child development as well as family functioning), Early Head Start children showed greater cognitive and language ability when compared to control group children (ACF, 2002) with effect sizes in the .20–.25 range for these cognitive and language outcomes. While home visiting programs have demonstrated some positive child outcomes, especially among youngest children,

some reviewers argue that center-based programs are more likely to demonstrate child effects (Benasich & Brooks-Gunn, 1996). However, interventions for children under three (Brooks-Gunn et al., 1994) have often included home visiting/family support components as well as center-based components, illustrating that delivery of home visiting and center-based services may not be as separate as sometimes appears to be the case.

1.2. Variation in home visiting services

A review of the literature (see Gomby et al., 1999) and a recent meta-analysis (Sweet & Appelbaum, 2004) suggest the operative question may not be whether home visiting is an effective service delivery strategy but *under what conditions* programs achieve effects. Enormous variability in the purposes, services and outcomes both across and within home visiting programs has been documented (Sweet & Appelbaum, 2004). The differences, as well as the similarities, have been framed by the National Home Visiting Forum, consisting of six major home visiting programs in the US today (Nurse Home Visiting Program, Parents as Teachers, HIPPY, the Parent–Child Home Program, Healthy Families America and Early Head Start; described in Weiss, 2004). The task of addressing variation is complex and includes the need to identify salient features or meaningful components of home visiting; the need to understand how involvement may vary for different population subgroups and the need to learn more about the importance of involvement in relation to outcomes. The current study addresses each of these dimensions of variability.

1.2.1. Identifying meaningful components of home visiting

The home visiting field, as is true for some other service fields, has had difficulty operationalizing and conceptualizing meaningful components of services. Littell, Alexander, and Reynolds (2001) provide five examples of operationalizations of a "simple" dichotomous indicator of program "participation" (e.g., receipt of any service; receipt of any service beyond intake/assessment; completion of a service; receipt of services for a specified time period; and receipt of a specified number of services). Littell et al. (2001) also found that most research studies use only a single measure of parent involvement, and that these measures vary widely and tend to focus on either: (1) dichotomous measures of participation (did the client receive services or not?); (2) measures of service frequency or attendance; or (3) ratings by the provider of participants' level of parent involvement. Measures in the first two categories reflect simple or more directly-measured quantity of services, while clinician ratings' may be more likely to include subjective judgment on the part of the provider that may reflect the emotional investment of the client. The authors found few studies that conceptualize parent involvement as a multi-dimensional construct.

Kazdin, Holland, and Crowley (1997) and Kazdin and Wassell (1999) have suggested a multidimensional model of mental health service participation that captures aspects of both *amount* and *valence* of participation; measures of both of these dimensions may be critical to understanding the relationship of parent involvement to program outcomes.

Conceptual models have helped to guide the measurement of program services in medical and social work fields, but there have been fewer conceptual frameworks advanced in the home visiting field. Recently, Korfmacher et al. (2005) identified two major dimensions of parent involvement in home visiting programs: the *quantity* of involvement and the *quality* of engagement in home visiting services. These two broad areas subsume other components, many of which are potentially measurable. Quantity of involvement variables include number of home visits, duration of enrollment in program services, and total hours of home visiting services received. Quality of engagement includes variables such as staff ratings of how engaged parents are in program services generally, interest and engagement of parents in particular home visiting activities, and the quality of relationships between staff and parents. Thus, the Korfmacher and colleagues model includes both relatively simple constructs such as duration of enrollment in services as well as more complex, dynamic conceptualizations related to the parents' motivation and actions in partaking in program services. In our study, engagement is thought to reside in the parent, although it may be observed and promoted in the context of transactions between staff and parent. The Korfmacher model provides the basis for the current work, which explores these theoretical constructs empirically. The current work is also informed by Wagner, Spiker, Linn, Gerlach-Downie, and Hernandez (2003) whose conceptual approach characterizes both quantity and quality of service components and by McCurdy and Daro (2001), who developed a more general conceptual model of factors related to enrollment and retention of participants in family support programs.

Different measures of parent involvement reflect different perspectives of those involved in a program. Staff reports of client involvement in services, attitude towards services, and rates of compliance or attendance are common. Fewer studies have examined participation from the point of view of the service recipient (Littell et al., 2001). Fur-

ther, there has been little systematic study of the relative merits of different modes of data collection, despite the fact that some methods may be considerably easier from a data collection standpoint for some types of programs or evaluations than others. For example, are global staff ratings of a parent's participation sufficient, or must each service event be documented? Are parents reliable reporters of the amount of services they have received? How many types of data must be collected to represent home visiting services? In the current study of multiple dimensions of home visiting, we explore a variety of data collection modes in a diverse sample.

1.2.2. Variability of involvement in home visiting by family demographic characteristics

What do we know about who participates in home visiting programs? Wide variability in home visiting involvement across population groups has been reported (Daro & Harding, 1999; McCurdy, Hurvis, & Clark, 1996; McGuigan, Katzev, & Pratt, 2003). Families more advantaged from the standpoint of income and education tend to be more involved in home visiting, while high risk families appear to be the most difficult to serve successfully (Larner, Halpern, & Harkavy, 1992; Wagner et al., 2003). Luker and Chalmers (1990), for example, found mothers with limited maternal support were more likely to withdraw from the program early. Lower rates of involvement have been found among mothers who experienced family conflict (Herzog, Cherniss, & Menzel, 1986), were substance abusing (Navaie-Waliser et al., 2000), or were anticipating a change of residence (National Committee to Prevent Child Abuse [NCPCA], 1996), and higher rates have been found among mothers whose infants displayed health risks (Olds & Kitzman, 1993). Some demographic/family factors seem to be unrelated or inconsistently related to family retention in home visiting programs, e.g., race/ethnicity, teen parent status. Herzog et al. (1986) did not find ethnic differences, however, one study found higher recruitment and retention rates for Hispanic parents (Dumka, Garza, Roosa, & Stoezinger, 1997).Wagner et al. (2003) reported lower rates of recruitment for African American parents, lower rates of attendance but higher rates of follow-up among Hispanic parents and higher levels of most forms of involvement among white parents (Wagner et al., 2003). Findings by age of parent have been equivocal, with some studies showing more participation among younger parents (Herzog et al., 1986; Olds & Kitzman, 1993) and others showing less (Birkel & Repucci, 1983). In the current study, we will measure the relation of mother's marital, employment/schooling, educational, cash assistance, and teen parenting status to home visiting involvement. We will also examine relations to race/ethnicity, maternal verbal ability, whether the target child has a disability, and residential mobility. We will explore how each relates to multiple home visiting involvement components. This is similar to a strategy employed by Wagner et al., who reported differential relations between demographic characteristics and types of engagement in a home visiting program.

1.2.3. Linking variability in services to outcomes

Studies linking variability in services in early childhood programs to outcomes tend to concentrate on service dosage globally (Hill, Brooks-Gunn, & Waldfogel, 2003; Ramey et al., 1992). For example, these studies investigate whether (or not) families are involved in the program but a few go to the next level, as does the current study, to examine specific components of home visiting as predictors of outcomes. An exception to the general literature, Sweet and Appelbaum's meta-analysis of home visiting (2004) demonstrated that cognitive outcomes varied as a function of *specific* components of involvement, including whether programs had professional staff, by number of home visits and number of hours of home visits, while parenting outcomes and parenting education were not affected by these inputs. Also, Powell and Grantham-McGregor (1989) reported that urban Jamaican 16–30-month-old children visited weekly in their homes had better outcomes on the Griffiths Mental Development Scale than children visited less often and than control group children. Thus, there is some support for a link between number and intensity of home visits and child cognitive/developmental outcomes but links between other varying features of home visiting (e.g., engagement of parent, child-focused activity) and child outcomes and between most component measures and parenting outcomes are basically unexplored or unsubstantiated.We explore some these links in the current study using different measures of involvement.

1.3. The current study of home visiting involvement

A first step toward greater understanding of how involvement components affect outcomes is to identify and collect a variety of different process measures and empirically examine their relations to each other and to outcomes. In the current study, seven measures of parent involvement are measured. Some of the measures are from parent report and others are from staff report. Following the Korfmacher et al. (2005) framework, the measures include indicators of *quantity of involvement*, such as number of home visits, duration in the program, the extent to which families received the

services prescribed by the program, and length of visits, as well as measures of more subjective aspects of parent involvement that relate to the *quality of engagement* in the services, such as staff ratings of global engagement across the family's time in the program and rating of engagement during specific visits. Finally, because Early Head Start is a child development program and seeks to have positive effects on children's development, we include a measure of the *content* of the visit, specifically, the extent to which the visits focused on activities directly related to the child. Thus, the first study question is: Are there multiple and distinguishable components of home visiting services, related to quantity, quality and content? We hypothesize that quantity measures will be correlated with each other and not with other measures, that quality measures will be correlated with one another but not with other measures and that the content measure will be independent of other measures. Altogether we propose that these three areas will represent distinct components of home visiting service provision.

A second part of the current study explores how these parent involvement components are related to family characteristics. It is generally understood from the home visiting literature that families are differentially involved in home visiting programs. Moreover, parent characteristics may predict different types of involvement. Some families may stay involved in the program over a long period of time but may not ever seriously engage in intensive services. Families with other characteristics may be very involved for a short period of time. Factors such as maternal age, education, occupation, welfare involvement, verbal ability, race/ethnicity as well as child disability and mobility might all be expected to affect parent involvement in a home visiting program. Impacts on service receipt were found to vary to some extent according to family demographic factors in the national Early Head Start overall study of impacts (e.g., for some subgroups the difference between the program and control groups in percent of families who received weekly home visits was greater than for others) (ACF, 2002). Here, we further explore relations between demographic/family factors and parent involvement in home visiting. Thus, a second purpose of the study will be to address the question: Do demographic/family characteristics predict components of home visiting services? We hypothesize that maternal risk factors (teen parenting, no high school, welfare receipt, not being married, not being in school or working, housing mobility, low levels of verbal ability) will be associated with reduced involvement in home visiting as has been found in other studies (Duggan et al., 1999; Herzog et al., 1986; Larner et al., 1992; NCPCA, 1996), and that Hispanic parents and parents of children with disabilities will be more engaged in services than others (Dumka et al., 1997).

Finally, we examine whether different parent involvement components are themselves differentially related to child and family outcomes. Understanding which aspects of involvement are most importantly related to child and family outcomes will enable programs to fine-tune program services to achieve desired outcomes (Guralnick, 1997). Specifically, the third research question is: Are child and family outcomes predicted by home visiting components, before and after controlling for demographic factors and earlier functioning on the outcome measure? We hypothesize that before controlling for demographic factors, many service variables may be related to outcomes and when demographic variables, as well as earlier functioning, are controlled, quantity and quality of service may still relate to some outcomes. Based on the work of Korfmacher et al. (2005), we hypothesize that quality of engagement will be particularly related to parent–child interaction and mental health. We also propose that child-focused activity will affect child outcomes based on findings showing the closer the intervention to the child, the greater the likelihood of achieving child outcomes (Benasich & Brooks-Gunn, 1996). However, because few studies similar to the current one have been conducted, it is necessary to regard the current work as largely exploratory.

By answering these questions using a variety of involvement measures, we hope to be able to make recommendations about the kinds of involvement indicators that might be of greatest use to programs or researchers. The current study does not attempt to control for all program features that could affect child or parent outcomes because the number of programs in the study is relatively small; there may be other within-program, program-level, community-level or regional features besides those measured in this study that could contribute to outcomes.

2. Method

The Early Head Start Research and Evaluation Study was an experimental design study conducted in 17 Early Head Start programs funded during the first 2 years of the program's existence. The study enrolled children and families in the program and control groups when children were 12 months old or younger and completed assessments of children and interviews with parents when children were 14, 24, and 36 months of age. In addition, Parent Services Interviews (PSIs) were

completed on average 7, 16, and 28 months after enrollment and many additional measures of program services were collected. The study analyzed impacts for approximately 2000 children and families when children were 36 months of age (ACF, 2002).

2.1. Sample

The sample for the current study included 11 of the 17 programs that participated in the Early Head Start study. The 11 programs included those in which over 80% of the families received home visits; thus, either all families were enrolled in the home visiting option (seven programs) or most of the families in the program were enrolled in that option (four programs). The 11 programs included those providing services in both rural and urban areas, in areas of the western, midwestern and eastern United States. There were no programs located in the southern United States among the mostly home-based programs in the study. Because the purpose of the study was to assess within-group variation, no data from the control group were included. The sample (referred to hereafter as the full sample) used for descriptive analyses included parents who had home visit service data collected in two or more ways (i.e., by parent interview and staff rating) in this study (n = 372–579, depending on measure). Of the full sample of participants, 45% were white, 25% black/African American, 27% were of Hispanic origin, and another 4% were from other racial/ethnic groups.3 Most respondents spoke English as their primary language, but 25% did not. Nearly two-thirds of the children were first born (60%), and nearly a third (32%) of the mothers were teenagers at the time of the study child's birth. Accordingly, 45% of the full sample had not finished high school at the time the study began; only 30% of the mothers lived with a husband; 35% were on cash assistance, and 17% were enrolled in school or training at the time the study began. Because the study drew from many measures collected over multiple time points and data were not complete for all families leading to listwise deletion of subjects in complex analyses, the sample for examining child and family outcomes was smaller than the full sample (Table 1, column 2). It is important to examine the characteristics of families in the full sample compared to those in the regression sample. Respondents having both child and parent outcome data and the home visit variables are described in Table 1 (column 3) as the regression sample.

We next statistically compared the regression sample to the respondents in the full sample not in the regression sample (not in Table 1; described below in text). Regression and full-sample parents not in the regression analyses were not significantly different from one another in the percentage who were non-English speaking, lived with a husband, were teens at the time of the focal child's birth and in educational attainment at the time of enrollment into the program. They were also not significantly different in the percent of children who were firstborn, male or were receiving Part C services. However, there were differences in the two groups by race/ethnicity ($\chi 2 = 23.86$; $p < .000$). Regression sample parents were more often white and less often black/African American than others in the full sample while Hispanic and other racial/ethnic group participants were more similar across the two groups. Regression sample parents were more often in school or training than other full-sample parents and less often not employed or in school ($\chi 2 = 4.87$; $p = .09$). The regression sample parents had higher average scores on the Woodcock Johnson measure than other full-sample parents ($F = 6.89$; $p = .009$). However, despite some differences, the regression sample and other families in the full sample remained predominantly very low-income, unmarried parents, characterized by notably low levels of education, and included relatively substantial subsets of teen parents and parents who did not speak English.

2.2. Measures

Measures used in the current study were completed at various times during the assessment period: family characteristics and background, except as noted, were collected at baseline; child variables were collected when children were 14 and

[3] Differences in service use and outcomes by race/ethnicity reported in the Early Head Start technical report of program impacts (ACF, 2002) suggested controls for race/ethnicity should be used in the current study. To some extent, it is impossible to avoid confounds of race/ethnicity from site as programs elect to serve specific, targeted population areas and these areas may include concentrations of particular racial/ethnicity groups. However, race/ethnicity and site are not synonymous in this sample. All sites served white parents, with the largest contributing 27%, 17% and 15% to the sample of white parents; all but two sites served some black/African American parents with the largest three contributing 40%, 21% and 14% to the study sample of black/African American parents; all but two sites served some families of Hispanic origin, with the largest three sites contributing 32%, 34%, and 12% to the sample of families of Hispanic origin. Families in the small group of other racial groups were in all but three sites in the current study.

Table 1
Measures, administration times and outcomes for full and regression samples

Demographic and other predictor parent variables	When assessed	Full sample (n = 372–579)	Regression sample (n^a = 179–231)
Race/ethnicity	Baseline		
White		44.6%	54.3%
Black/African American		24.5%	16.8%
Hispanic		26.8%	22.8%
Other		4.1%	6.0%
Language spoken in the home	Baseline		
English		75.5%	78.3%
Not English		24.5%	21.7%
Child is first born	Baseline		
Yes		59.5%	61.5%
No		40.5%	38.5%
Teen parent	Baseline		
Yes		32.0%	35.5%
No		68.0%	64.5%
Highest grade completed	Baseline		
<12		44.9%	44.6%
12		29.3%	33.3%
>12		25.9%	22.1%
Lives with	Baseline		
Husband		30.2%	31.2%
Other		37.3%	39.8%
Alone		32.5%	29.0%
Receiving CASH assistance	Baseline		
Yes		34.8%	29.1%
No		65.2%	70.9%
Working in school or not	Baseline		
Working		22.0%	24.2%
In school or training		16.7%	19.5%
Neither		61.2%	56.3%
Total number of demographic risks (of 5)	Baseline	1.8 (.8)	1.8 (.8)
WJ maternal verbal ability standardized score	24-month interview	90.5 (11.1)	91.6 (12.4)
Family mobility	7, 16, 28 months after enrollment, exit		
Moved at least once		70%	74%
Did not move		30%	26%
Received Part C services	7, 16, 28 months, exit		
Yes		9%	9%
No		91%	91%
Home visit measures			
Number of home visits	7, 16, 28 months; exit	75.7 (42.7)	87.4 (37.9)
Duration in program in months	Staff determination of exit and exit interview with parent	26.1 (10.6)	30.1 (8.7)
Intensity of home visiting in number of measurement periods (of 3) with expected intensity of weekly visits.	7, 16, 28 months, exit	1.7 (1.1)	1.9 (1.1)
Length of home visit in minutes	Average of staff record completed for each individual home visit	79.2 (18.1)	79.2 (19.9)
Overall engagement	Staff rating near program exit	3.2 (.9)	3.3 (.7)

Table 1 (*Continued*)

Demographic and other predictor parent variables	When assessed	Full sample (n = 372–579)	Regression sample (n^a = 179–231)
Visit-specific engagement on 5-point rating scale	Average of staff rating of engagement for each individual home visit	4.6 (.5)	4.5 (.5)
Child-focus during home visit, percent of time child focused	Average, completed by staff for each home visit	57.2 (16.5)	59.9 (15.7)
Child outcome and control measures			
Bayley MDI—standard score	Child age 36 months	93.2 (12.1)	93.6 (12.8)
Bayley MDI—standard score	Child age 14 months	97.9 (12.0)	97.9 (12.6)
PPVT-III—standard score	Child age 36 months	85.5 (15.7)	86.7 (15.6)
CDI-Vocabulary—number of words	Child age 14 months	12.2 (12.5)	11.3 (12.6)
Parent outcome and control measures			
Supportiveness	Child age 36 months	4.0 (.9)	4.0 (1.0)
Supportiveness	Child age 14 months	4.2 (1.0)	4.2 (1.0)
HOME	Child age 36 months	28.0 (4.6)	28.1 (4.5)
HOME	Child age 14 months	26.0 (3.6)	26.8 (3.6)
Support for language, literacy	Child age 36 months	10.8 (1.9)	11.0 (1.8)
Support for language, literacy	Child age 14 months	9.8 (2.0)	10.0 (2.0)
Parents with moderate level of depressive symptoms	Child age 36 months	32% (.47)	37% (.48)
Parents with moderate level of depressive symptoms	Child age 14 months	34% (.47)	36% (.48)

[a] Sample means in regression outcome analyses range from 144 to 216, slightly lower than for descriptive analyses reported here, due to listwise deletion in individual analyses.

36 months of age; parent variables when children were 14 and 36 months of age; and parent involvement measures were collected during service interviews 7, 16, and 28 months after enrollment and in a variety of other ways as described in greater detail later. A list of all measures, the data collection schedule, and descriptive data (for both the full and regression samples) are listed in Table 1. These measures are described below and as well as in greater detail in the Early Head Start study technical report (ACF, 2002).

2.2.1. Family characteristics and outcome measures

Baseline demographic data (e.g., primary language spoken; race/ethnicity; whether the child was first or later born; whether mother was a teen at time of child's birth; highest education grade completed; whether married and living with her husband, someone else or alone; whether in school or working; and whether receiving assistance) were obtained from the Head Start Family Information System Enrollment Form, completed by staff interviews when families enrolled in the program.

In addition, three other variables, collected after baseline assessments, were analyzed with demographic variables. These were the scores for mothers on the Woodcock Picture Vocabulary Test (Woodcock & Munoz-Sandoval, 2001), a test of parental verbal ability administered when children were 24 months of age completed by asking parents to identify a picture of a named object.[4] Second, during service interviews conducted 7, 16, and 28 months after random assignment, parents were asked if they had changed residence; a dichotomous variable was computed based on whether the parents had ever moved during the study. During these same interviews, parents were asked whether their child received Part C services for children with disabilities, and a dichotomous variable was created accordingly. Child data reported in the current study were collected when children were 14 and 36 months of age. At 36 months, cognitive and language development were assessed by trained assessors using the Bayley Mental Development Index (MDI) from the Bayley Scales of Infant Development (Bayley, 1993), and the Peabody Picture Vocabulary Test—Version Three (PPVT-III; Dunn &

[4] In order to minimize sample loss due to listwise deletion in regression analyses, scores on theWoodcock Picture Vocabulary Test were imputed for participants missing those scores using 40 baseline characteristics of non-missing cases. See Table 1.

Dunn, 1997).[5] Standardized scores for both are reported. We also included as control variables, the 14-month Bayley MDI (for the 36-month MDI), and the MacArthur Communicative Development Inventories Short Form measure of vocabulary production (CDI; Fenson et al., 1994) (for the PPVT-III) administered when children were 14 months old. The Infant Form of this index used in the current study consists of a checklist of 89 words from which parents identified words they judged their children could to produce. In each case, the control variable was the earliest measure available of comparable child abilities. Because all children were enrolled in the program before age 1 and in about a quarter of the cases, before birth, Early Head Start services had been received by the time children were 14 months of age. Thus, our controlling for 14-month functioning on the measures is conservative, as children and families are likely to have already been affected by program services. Child outcome measures used have good psychometric properties as reported by the publishers. In the norming sample, MDI internal reliability was .88, test–retest reliability ranged from .77 to .91, and the MDI was correlated with other tests of cognitive functioning, including the McCarthy Scales of Children's Abilities (.79) and the Wechsler Preschool and Primary Scale of Intelligence—Revised (.73). The PPVTIII has good internal consistency reliability (Cronbach's α = .92–.98) and correlates highly (.8–.9) with intelligence tests. The authors report split half reliabilities of .91 for children aged 3 years and of .80 for children aged 2½ to 3 years.

Parent data included measures of parent supportiveness, the home environment, and maternal depression assessed when children were 14 and 36 months of age. Ratings of parent supportiveness (parent tendency to engage with the child using sensitive and cognitively stimulating interactions during play) were obtained from videotapes of parents participating in a semi-structured play task (National Institute of Child Health and Human Development [NICHD] Study of Early Child Care, 1992). Responses were coded by a trained team of interviewers blind to the treatment status of children and families. Percent agreement (exact or within one point) averaged 90% at 14 months and 94% at 36 months. The parent supportiveness scale was created by computing mean scores from coded scales of parental sensitivity, cognitive stimulation and positive regard, thereby providing a measure of global parent–child interaction that was validated by analyses showing strong relations between the measure and child outcomes (Tamis-LeMonda, Shannon, Cabrera,& Lamb, 2004). Scores could range from 1 to 7 with the higher number representing greater amounts. For the overall scale, the α coefficients at 14 and 36 months, respectively, were .82 and .83. Interclass correlations on the coded scales comprising the measure were computed for 11% of the video tapes comparing coders to a gold standard coder. For parental sensitivity, interclass correlations at 14 and 36 months, respectively, were 70% and 63%, for cognitive stimulation, 71% and 59%, and for positive regard, 72% and 62%. Parent interviews included the Home Observation for Measurement of the Environment (HOME; Caldwell & Bradley, 2003), which was used to assess the general quality of the home environment in terms of support for children's development. Thirty-seven items comprised the HOME scale, and at 36 months, the α coefficient was .80 (at 14 months, .87). A subscale that focused on parent support for language and literacy was also calculated from the HOME. This subscale included 13 items related to early language learning and materials to support it, e.g., presence of books in home, presence of other toys and materials that stimulate conversation, parental conversation with child, parental reported reading to child. α coefficient for the scale was .66 at 14 months and .73 at 36 months (Fuligni, Han, & Brooks-Gunn, 2004). The CES-D (Radloff, 1977) was also included to assess parents' level of depressive symptoms. At 36 months, a short form of this measure that included 12 items was used (α = .88). At 14 months, the full measure with scores ranging from 0 to 56, was used as a control for 36-month depression (α = .88).

2.2.2. Parent involvement measures

The measures of parent involvement were collected in three ways: (1) Parent reports of involvement were collected through the Parent Services Interview (PSI), collected at 7, 16, and 28 months following program enrollment, and again near the time a family exited the program (if more than 26 months). (2) Staff reports of parent involvement were obtained from 22,825 home visit documentation forms completed with families at these sites (these forms were completed for each home visit and included such variables as the percentage of time spent on various topics, the perceived engagement of parents in the home visit activities, and the duration of each visit). (3) Finally, staff also completed global ratings of parent involvement at the time of family exit from the program. This study measured seven specific components of parent home visiting.

[5] For approximately 15% of the children, Bayley MDI assessments were completed in Spanish. Children could complete the PPVT in English or the Teste of Vocabulario en Images Peabody in Spanish (TVIP; Dunn, Eligio, Padilla, Lago, & Dunn, 1986). Some bilingual children completed the PPVT in English and for others the TVIP was selected by their parents. Because the number of Spanish-speaking children completing the TVIP test was small and further diminished due to listwise deletion across the many different data collection points used in the current study, we do not include children who completed the TVIP instead of the PPVT here.

2.2.2.1. Quantity of home visiting.

Four measures that assessed the quantity of home visiting participation (Korfmacher et al., 2005) were calculated: number of home visits; duration in the program; intensity of home visits over three measurement periods; and average length of each visit.

2.2.2.1.1. Number of home visits (parent report). At each of the PSI interviews, parents were asked to report how often they had received Early Head Start home visits since the time of the last interview (or, since enrollment for the first PSI) in terms of the frequency per week or per month. The total number of home visits was estimated for each family by multiplying the number of visits the family received per week or month times the number of weeks in the follow-up period, and then summing across the three time periods. Because the length of the total follow-up period for families varied, the total number of home visits was adjusted to reflect the total number of visits during a 28-month follow-up period (the maximum length of time covered by the interviews for all families). Using this measure, the average total number of home visits in the full sample was 75.7 (S.D. = 42.7) visits in 28 months.

Number of home visits was also determined by summing the number of reports of home visitors completed after each home visit. The time periods for parent report data were adjusted to be comparable for the time periods for which staff report data were available. The average number of prorated parent-reported visits for the period that corresponded to the home visit documentation that staff provided was 39.4 (S.D. = 34.7) compared to 39.1 for staff reports. Thus, the number of visits reported through parent report and those collected by home visiting staff for comparable periods corresponded highly. Because the parent report data extend for a longer period of time and were collected for more families, and due to their good correspondence to data collected by staff report, parent report of the number of visits data are used in this study.

2.2.2.1.2. Duration of program enrollment (staff report). Most programs record when families enter and leave the program. However, defining the duration of program enrollment is not necessarily straightforward (Korfmacher et al., 2005). For example, it is possible that different staff or programs use different decision rules in determining when a family leaves the program. Some programs maintain families on the enrollment roster even when they are not actively participating (in hopes the family will return to more active status) while other programs are relatively quick to exit a family that is not regularly receiving services. In this study, enrollment was defined as beginning when the family was recruited into the program and randomly assigned to participate in EHS services. Enrollment was defined as ending at the date of the last contact with families. The measure of duration was created by subtracting the family's enrollment date from the date recorded by staff as the last contact with the family. There were a few families for whom staff did not provide this information; for those families an estimate of duration in program was created using the parents' estimates of the number of months they were in the program. On average, parents participated in the program for 26.1 months (S.D. = 10.6).

2.2.2.1.3. Intensity. Intensity measures the extent to which the family received weekly home visits as specified by the Head Start Performance Standards. This measure of parent involvement was created by identifying the number of follow-up periods in which the family received weekly home visits. There were three follow-up periods all together (7, 16, and 28 months post-enrollment), so scores on the intensity variable could range from zero to three. The number of follow-up periods the average parent received the required number of home visits was 1.7 (S.D. = 1.1).

2.2.2.1.4. Average length of visit (staff report). Early Head Start home visits are designed to be 90 min, on average; however, if a family is difficult to engage or has other conflicts, visits could be shorter. The average length of visit measure was created by averaging the length of each visit in minutes (collected on home visit documentation forms) for all documented visits. The average length of visit by staff report was 79.2 min (S.D. = 18.1).

2.2.2.2. Quality of home visits or engagement. Measures of quantity are not sufficient to capture the quality of engagement of a parent in a home visiting program. For example, a parent might complete the home visit but not be fully engaged in the activities provided. Conversely, some families may miss home visits but participate so enthusiastically that the program brings them benefits. Two measures of quality of engagement in the program were included.

2.2.2.2.1. Global engagement (staff report). A single designated staff member who had known the family well rated the overall engagement of each family at the end or towards the end of the family's program experience. The measure of global engagement took into account the quality of engagement over time. Staff rated family engagement on the following scale: 4 = consistently highly involved in program throughout enrollment; 3 = involvement varied and was

sometimes high, sometimes low during family's enrollment; 2 = involvement was consistently low throughout enrollment; 1 = not involved at all. On average, staff rated family's involvement as 3.2 (S.D. = .9).

2.2.2.2.2. Home visit specific engagement (staff report). This measure was created by averaging the ratings of the mother's engagement during each home visit as rated by the home visitor completing the home visit and recorded on the home visit documentation forms. Staff rated engagement in each visit on a 5-point scale, 5 = highly interested; 3 = available; and 1 = not involved. The average across ratings at the completion of each home visit was 4.6 (S.D. = .5). Thus, ratings showed that parents were generally quite engaged during home visits.

2.2.2.3. Content of the home visit. One variable, the percent of the home visit spent on *child-focused activity*, was included that was to provide a broad indicator of the content of the visit. Early Head Start emphasized the importance of engaging children in home visits as child development is the key cornerstone of the Early Head Start program. However, because Early Head Start is a two-generation program, time is also devoted to promoting self-sufficiency and healthy family functioning. Thus, we included measures assessing the extent to which the home visits were focused on child development versus family issues. At the completion of each home visit, home visitors recorded the percentage of home visit time that was devoted to child-focused activities (for example, activities to promote child development), and these percentages were averaged over all documented home visits for the family. On average, home visitors reported spending 57.2% of the time during home visits on child-focused activities (S.D. = 16.5). Home visitors were also asked to record the percentage of the visit that was devoted to family-focused activity and how much time was devoted to rapport-building activity. The average percentage of time focused on parents, from the home visitors' perspective, was 28.4% (S.D. = 13.9). The percentage of time focused on rapport building was 14.4% (S.D. = 9.3). As each visit was divided among these three variables, they were necessarily inversely related to another. The correlations between child-focused and the parent- and rapport-focused time were −.83 and −.54, respectively. Average home visits were more focused on children than on parents but there was variation. As child-focused time was hypothesized to affect child outcomes, and because it inversely related to the other variables, we only include the percent of time on child-focused activity in subsequent analyses.

Descriptive statistics, including indicators of skewness and kurtosis were calculated for each of the home visiting variables. No significant deviations from normality were noted: all skewness statistics were <−1.6; all kurtosis statistics were <2.96. The measure of home visit specific engagement showed a tendency towards a positive bias (mean score = 4.5 on a 5-point scale) but does not appear to be problematic in terms of its distributional properties.

3. Results

3.1. Relations between measures of parent involvement in home visiting

In order to determine the extent to which parent involvement elements were related to one another, Pearson correlations were completed and are shown in Table 2.

The analyses showed that three (number of home visits, duration, and intensity) of the four variables measuring *quantity* were substantially intercorrelated. Average length of visit was not highly associated with the other quantity variables. Regarding *quality* variables, global engagement related to visit-specific engagement but it was also related to several quantity variables, suggesting that staff considered various elements of parental involvement when making these ratings. Engagement during the visit was significantly related to overall engagement but only weakly to other variables. Child-focus in home visits appeared to be largely independent of other measures.

3.2. Predictors of home visit involvement variables

To determine whether family characteristics were related to the parent involvement variables, we conducted bivariate (Table 3) and multiple regression analyses (Table 4) using the parent involvement measures identified in the preceding analyses: total number of visits by parent report; duration; number of reporting periods with required weekly visits (intensity); average length of visits as reported by staff; global engagement rating; average home visit specific engagement during visits; and time spent on child-focused activities. Family characteristics at program enrollment included: whether the mother was a teen parent, single, had a high school diploma or GED, employed or in school, or received Aid to Families with Dependent Children (AFDC) or Temporary Assistance to Needy Families (TANF). Other family variables assessed included: whether the family ever moved during the course of the study; whether child was ever identified as eligible for

Part C services; and the mother's verbal ability. Finally, four race/ethnicity dummy-coded variables were examined, including whether the family was white, African American, Hispanic/Latino and English-speaking, or Hispanic/Latino and non-English speaking with other race/ethnicity as the omitted reference group.

As expected, bivariate analyses showed that family characteristics significantly associated with many of the parent involvement variables, although the magnitude of associations was generally small (in the .1–.2 range) (see Table 3). Next, we examined the extent to which the family characteristics, as a set, predicted the parent involvement measures. In each of seven multiple regressions, one of the parent involvement measures served as the criterion variable, and the family characteristics were examined as possible predictors of participation. Table 4 summarizes the results of these multiple regression analyses. Not surprisingly, the linear combination of family characteristics accounted for significant variance in all parent involvement measures except for the length of home visits. Unique significant predictors of components were as follows: for number of home visits, white parents (B = .34; S.E. = 10.71) received more total visits than parents in the other racial groups; white parents (B = .39; S.E. = .27) also were the recipients of higher home visit intensity. Parents not completing high school received lower intensity of visits (B =−.16; S.E. = .14). Families who moved during the study had briefer duration in the program (B =−.17; S.E. = 1.21) while families with a child who had a disability had longer duration (B = .14; S.E. = 1.58) than other families. Teen mothers had significantly shorter visits than older mothers (B =−.17; S.E. = 3.00). There were no unique predictors of overall engagement at the .05 level of probability, however, visit-specific engagement was positively predicted by mother's verbal ability (B = .27; S.E. = .00) and by whether mother was Hispanic non-English speaking (B = .39; S.E. = .17). Finally, black/African American parents (B =−.25; S.E. = 5.45) and single parents (B =−.22; S.E. = 2.27) were less likely to receive child focus during the visit than their counterparts.

3.3. Home visiting involvement variables as predictors of child and family outcomes

To determine if parent involvement variables differentially predicted child and family outcomes, bivariate relations between the home visiting variables and outcomes were first conducted and then regression analyses, separately regressing the six outcome variables on the home visiting variables, adding controls for demographic/family factors and prior functioning at 14 months, were conducted.

Child and family outcome variables were selected as examples of different types of outcomes that programs are likely to target. The variables selected are not exhaustive of the Early Head Start measures but rather represent *types* of measures in order to examine whether parent involvement variables predict outcomes differentially. Outcome variables (described previously) included child, parenting, and parent mental health measures collected when children were 36

Table 2
Bivariate relations between home visiting variables

	1	2	3	4	5	6	7
1. Total number of home visits (sample size)			.45*** (497.79*** (558)	−.03 (365)	.32*** (579)	.07 (372)	.05 (384)
2. Duration in the program (sample size)			.34*** (482)	.05 (291)	.41*** (558)	.13* (304)	.06 (310)
3. Intensity: Periods receiving weekly visits (sample size)				−.05 (378)	.25*** (558)	.03 (354)	.05 (366)
4. Average length of visits (sample size)					.13** (365)	.13* (354)	.04 (365)
5. Overall engagement (sample size)						.32** (372)	.02 (384)
6. Home visit specific engagement (sample size)							.13* (372)
7. Percent of the home visit in child-focused activity							–

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 3
Bivariate correlations between child and family characteristics and criterion variables

Predictor	Criterion variables						
	Number of home visits (n = 443–579)	Periods with required weekly visits (ratio) (n = 433–558)	Mean length of visits (n = 288–365)	Duration of participation (n = 382–486)	Global engagement (n = 443–579)	Engagement of mother during visits (n = 291–372)	Percentage of visit spent on child-focused activities (n = 297–384)
Receiving welfare cash assistance	−.09	−.11*	−.01	−.04	−.11*	−.10	−.09
Teen mother	−.04	−.03	−.12*	−.01	−.13**	−.11*	−.06
Single parent	−.12**	−.13**	−.00	−.01	−.12**	−.13*	−.20***
No HS diploma or GED	−.13**	−.20***	−.01	−.03	−.16***	−.09+	−.11*
Not employed or in school	.02	.05	.00	−.05	−.04	.07	.04
Ethnicity/language[a]							
White	.22***	.27***	−.03	−.06	.01	−.03	.07
African American	−.14***	−.11*	−.01	−.08	−.11*	−.14**	−.14**
Hispanic, speaks English	−.03	−.04	−.06	.10*	−.04	.03	−.01
Hispanic, does not speak English	−.07+	−.17***	.09+	.08+	.08+	.16**	.02
Maternal vocabulary (WJ-R)	.15***	.22***	−.07	−.02	.09*	.12*	.15**
Moved at least once	−.05	−.03	.00	−.18***	−.11*	−.04	−.10+
Child eligible for Part C services	.07+	.08+	.03	.15***	.06	.00	−.12*

[a] Analyses compare each group to mean of all other ethnic groups.
+ $p \leq .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 4
Summary of multiple regressions for each participation measure, using a linear combination of participant characteristics as predictors of parent involvement

Parent involvement (dependent) variables	R^2	d.f.	F
Number of home visits (parent report)	.093	12,360	4.16***
Periods received required intensity of weekly visits (parent report)	.143	12,352	6.07***
Average length (min) of home visits (staff report)	.015	12,285	ns
Duration (months) of participation (staff report)	.082	12,314	3.43***
Global involvement (staff rating)	.069	12,360	3.30***
Average engagement of mother during home visits (staff rating)	.080	12,241	2.84***
Average percentage of visit spent on child-focused activities (staff)	.086	12,243	3.01***

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 5
Bivariate relations between independent variables and child and family outcomes

Involvement and demographic variables	Outcomes					
	Bayley MDI ($n = 289$–424)	PPVT ($n = 257$–343)	Supportivenes ($n = 283$–424)	HOME ($n = 312$–461)	Support for language ($n = 316$–473)	Depression ($n = 350$–515)
Number of visits	.04	.08	.14**	.11*	.11*	−.01
Duration	.01	.10+	.08	.09+	.14**	−.01
Intensity	.10*	.14**	.22**	.12**	.13**	.02
Length of visit	−.04	.11+	.01	−.00	.03	−.01
Overall engagement	.12**	.13**	.16**	.13**	.11**	−.07+
Visit-specific engagement	.10+	.05	.20**	.19**	.19**	−.18**
Child-focused activity	.20**	.23**	.06	.31**	.21**	−.22**
Maternal vocabulary	.29**	.44**	.32**	.37**	.43**	.04
Demographic risk (sums teen parent, single, unemployment, no HS, unmarried)	−.09	−.22**	−.19**	−.21**	−.13**	.05
Moved at least once	−.08	−.10+	−.04	−.14**	−.05	.12**
African American	−.14**	−.14*	−.02	−.14**	−.06	.098
Hispanic	−.17**	−.27**	−.21**	−.15**	−.26**	−.12*
White	.24**	.29**	.19**	.22**	.26**	.05

+ $p \leq .10$.
* $p < .05$.
** $p < .01$.

months of age or at program exit: Bayley MDI scores; PPVT scores; HOME scores; HOME stimulation of language and literacy; parent supportiveness; and whether the mother was depressed when the child was 3 years old. Outcomes were selected for these analyses that showed a significant overall or subgroup effect in impact analyses between program and control groups (ACF, 2002) and that were significantly related to some home visit variables in bivariate analyses. Results from bivariate analyses are presented in Table 5. Many of the home visiting involvement variables associated significantly with child and family outcome variables, although the magnitude of these effects was small to moderate. Regression analyses were next performed using four blocks of regression variables[6]: quantity of involvement; quality of engagement; child-focused activity and demographics/family factors. Ordinary least square regressions were performed when the outcome was a continuous variable and binomial logistical regression was performed in the one case where the outcome was a categorical variable, whether the parent scored above or below the cutoff for moderate depression.

[6] As we have previously noted, in the regression analyses, variables were from measures collected at different times and from different informants during the study, causing a reduction in sample size due to listwise deletion.

Blocks were entered in the same sequence for both sets of regression analyses. In addition, for all analyses, scores on the outcome measure at the initial assessment were added to the final models as control variables. Block 1 corresponded to quantity of involvement and included number of home visits, ratio of completed to expected home visits, and duration. Because the quantity variable, length of visit, was not significantly associated with outcomes in bivariate analyses we did not include it in the model. Block 2 included the quality of engagement variables (global engagement as assessed by staff at the time families left the program and average engagement rated at the time of the visit). Block 3 was a single variable, the percentage of time during the home visit that was spent on child-focused activities. Finally, demographic/family variables were entered in block 4: demographic risk (an index that summed across being a single parent; lacking a high school diploma or GED; receiving public assistance; being neither employed nor in school and being a teenage mother), the mother's score on the Woodcock Johnson Picture Vocabulary Test, and whether the family had moved during the program experience. Additionally, race was dummy coded with "other race" as the referent group, and three separate race variables were entered, whether the family was African American, Hispanic/Latino or white. Due to restrictions based on sample size, it was necessary to reduce the number of demographic variables from the previous set of analyses. To that end we summed across the five demographic risk factors described above, with scores from 0 to 5 possible (see also ACF, 2002 for description of this variable used in the Early Head Start national impacts study) and we combined all Hispanic parents into one group. We did not use whether the child received Part C as disability status could have confounded with child outcomes. As noted, in the final block, an additional control was the child or parent 14-month assessment (the earliest assessment available for the sample) that corresponded with the outcome measure. Thus, the study assessed change over time in six outcome areas, as a function of home visiting variables, and before and after controlling for key demographic variables and earlier levels of functioning on the outcome.

Because home visits are embedded in wider ecosystems of staff, program, community, and regional context, other influences are also potential contributors to child and family outcomes in the context of an intervention program; thus, our expectations for the predictive value of the involvement variables were modest. So that potential contributions of home visit variables could be detected, the demographic block, expected to contribute a large amount of variance to the outcomes (ACF, 2002), was entered *after* the home visit variables in this study. While ultimately we were interested in which home visiting variables maintained significance after the variability due to demographics was accounted for, it was also of descriptive interest to see if home visiting variables explained variance before accounting for demographic factors.

3.3.1. Child outcomes

We examined two *child outcomes* (Bayley MDI and PPVT-III) in the regression models. For the Bayley MDI, quantity and quality blocks did not initially predict the outcomes but, in each case, child-focused activity did account for significant new variance. For the PPVT-III, the quality of engagement and child-focused activity blocks each added significant new variance when added to the models. When demographic variables as well as respective controls for earlier MDI and vocabulary production were added to models in the fourth block, child-focused activity remained a significant predictor in each model. Scores were more positive for children whose home visitors spent a higher proportion of the time on child-focused activity. Maternal verbal ability, MDI scores at 14 months, and being Hispanic were also significant predictors of MDI scores at 36 months, while maternal verbal ability was also a significant predictor of PPVT-III scores at 36 months. The overall regression model predicted 24% of Bayley MDI variance and 31% of PPVT-III variance (Table 6).

For *parenting outcomes* (supportiveness, overall HOME scores, and support for language and literacy) quantity and quality blocks were significant in all analyses, and the child-focused activity block added significant new variance for the latter two outcomes. However, no home visiting variables remained significant predictors of the supportiveness outcome when demographic and control variables were added in the full model. But for the overall HOME, child-focused activity remained significant, and for the support for language and literacy outcome, duration and child-focused activity remained significant in full models. Maternal verbal ability was a significant predictor of all three parenting outcomes, and 14-month HOME scores and support for language and learning were also significant predictors of respective 36-month outcomes. For parenting outcomes variance predicted was 18% for supportiveness, 42% for the total HOME score, and 36% for language and literacy support (Table 7).

In predicting the *mental health variable* (at 36 months scored above the cutoff for moderate depression on the short form of the CES-D [ACF, 2003]), a different pattern emerged. For depression, only quality of engagement variables predicted outcomes in early blocks. In the final model, parents who were rated as more globally engaged in the program and

those who were rated as more engaged during home visits were about half as likely to report symptoms associated with moderate depression when children were 36 months of age, controlling for demographic variables and depression when children were 14 months of age. Parents who reported depressive symptoms earlier and those who moved were also more likely to report symptoms of moderate depression when children were 36 months of age (Table 8). In summary, in the regression analyses the *quantity of participation block* (block 1) significantly predicted parenting outcomes (supportiveness, support for language and literacy and overall HOME scores) before other blocks were added. However, only one quantity of participation variable remained significant in final models, after controlling for all other variables (duration predicted parent support for language and literacy). The *engagement block* (block 2) significantly predicted (negatively) whether the parent was moderately depressed and (positively) all parenting variables as well as PPVT-III scores, before controlling for child-focused activity and demographic variables. In final analyses controlling for other variables, quality of engagement significantly predicted of lower levels of depression.

The *child-focused activity block* (block 3) including the single item, percentage of time during the home visit in child-focused activity, positively predicted both child and two parenting outcomes after controlling for all other involvement variables in previous blocks (Bayley MDI, PPVT-III, support for language and literacy and overall HOME scores).

Table 6
Relations between home visiting involvement variables and child cognitive and language outcomes

	Quantity, *B* (S.E.)	+Quality, *B* (S.E.)	+Child focus, *B* (S.E.)	+Demographic, *B* (S.E.)
Bayley MDI; F chg. (d.f.)	1.78 (3,153)	1.99 (2,151)	9.93 (1,150)**	5.45 (7,143)***
Cumulative Adjusted R^2	(.02)	(.04)	(.12)	(.24)
Number	−.14 (0.05)	−.18 (0.07)	−.18 (0.05)	.01 (0.00)
Duration	.11 (0.14)	.10 (0.14)	.06 (0.10)	−.01 (0.13)
Intensity	.22+ (1.54)	.23+ (1.53)	.23+ (1.49)	−.08 (1.67)
Overall engage		.13 (1.62)	.14 (1.57)	.07 (1.65)
Visit engage		.07 (2.08)	.04 (2.04)	.08 (1.65)
Child focus			.25** (0.07)	.23** (0.07)
White				−.16 (4.75)
African American				−.22 (4.98)
Hispanic				−.42** (4.80)
Risk				−.19 (1.32)
WJ				.23* (0.10)
Ever move				−.03(2.42)
Bayley MDI 14 months				.18* (0.09)
N = 157				
PPVT; F chg. (d.f.)	2.34 (3,140)+	3.32 (2,138)*	6.83 (1,137)**	6.91 (7,130)***
Cumulative Adjusted R^2	(.03)	(.06)	(.10)	(.31)
Number	−.02(0.05)	−.05 (0.05)	−.04 (0.02)	.00 (0.05)
Duration	.08(0.16)	.05 (0.16)	.03 (0.16)	.05 (.15)
Intensity	.20(3.03)	.21+ (1.89)	.22+ (1.85)	−.01 (1.83)
Overall engage		.24* (4.72)	.23* (1.79)	.13 (1.63)
Visit engage		−.09 (2.42)	−.11 (2.78)	−.13 (2.18)
Child focus			.21** (0.08)	.18* (0.08)
White				.19 (4.54)
African American				−.05 (4.95)
Hispanic				−.19+ (9.07)
Risk				−.08 (1.46)
WJ				.24** (0.11)
Ever move				−.05 (2.62)
Vocabulary 14 months				.02 (0.09)
N = 144				

+ $p \leq .10$.
* $p \leq .05$.
** $p \leq .01$.
*** $p \leq .001$.

Table 7
Relations between home visiting involvement variables and parent outcomes

	Quantity, *B* (S.E.)	+Quality, *B* (S.E.)	+Child focus, *B* (S.E.)	+Demographic, *B* (S.E.)
Supportiveness; F chg. (d.f.)	5.67 (3,191)***	5.04 (2,189)**	.00 (1,188)	3.50 (7,181)*
Cumulative R^2	(.07)	(.11)	(.10)	(.18)
Number	−.06 (.00)	−.13 (.00)	−.13 (.00)	−.06 (.00)
Duration	.15* (.01)	.13+ (.01)	.13+ (.01)	.12 (.01)
Intensity	.27* (.09)	.29** (.09)	.29** (.09)	.13 (.11)
Overall engage		.16* (.09)	.16* (.09)	.10 (.09)
Visit engage		.10 (.13)	.10 (.13)	.10 (.13)
Child focus			.00 (.00)	−.02 (.00)
White				−.10 (.31)
African American				−.15 (.33)
Hispanic				−.21 (.45)
Risk				−.11 (.08)
WJ				.22** (.01)
Ever moved				.05 (.15)
Supportiveness (14 months)				.06 (.02)
n = 195				
HOME; F chg. (d.f.)	2.82 (3,186)*	4.05 (2,184)*	26.55 (1,183)***	12.13 (7,176)***
Cumulative R^2	(.03)	(.06)	(.17)	(.42)
Number	−.08 (.01)	−.13 (.01)	−.13 (.01)	−.02 (0.01)
Duration	.15* (.04)	.12 (.04)	.07 (.04)	.16 (0.04)
Intensity	.18+ (.47)	.20+ (.46)	.21* (.43)	−.04 (.43)
Overall engage		.11 (.52)	.12(.48)	.06 (0.41)
Visit engage		.14+ (.69)	.11 (.64)	.02 (.56)
Child focus			.35*** (.02)	.22*** (0.02)
White				−.09 (1.27)
African American				−.23* (1.37)
Hispanic				−.11 (1.28)
Risk				−.10+ (036.)
WJ				.21** (0.31)
Ever moved				.00 (0.62)
HOME score at 14 months				.33*** (0.09)
n = 190				
Support for language; F chg. (d.f.)	3.09 (3,194)*	5.46 (2,192)**	15.71 (1,191)***	10.13 (7,184)***
Cumulative R^2	(.03)	(.07)	(.14)	(.36)
Number	−.07 (.01)	−.13 (.01)	−.13 (.01)	−.04 (0.01)
Duration	.16* (.02)	.12+ (.02)	.09 (.02)	.14* (0.02)
Intensity	.17+ (.19)	.20* (.18)	.21* (.18)	−.06 (.20)
Overall engage		.16* (.27)	.14+(.20)	.09 (0.18)
Visit engage		.12 (.20)	.13+ (.26)	.07 (.24)
Child focus			.27*** (.01)	.20*** (0.01)
White				−.04 (0.53)
African American				−.10 (0.56)
Hispanic				−.09 (0.54)
Risk				−.07 (.15)
WJ				.32* (0.01)
Ever moved				.09 (0.27)
Home language at 14 months				.24** (.08)**
n = 198				

+ $p \leq .10$.
* $p \leq .05$.
** $p \leq .01$.
*** $p \leq .001$.

This variable remained significant in the final models, suggesting that, even after controlling for many other measured variables, child-focused activity may be a key home visiting variable for effecting child outcomes and parenting behaviors related to supporting children's learning.

Finally, the *demographic/family characteristics variables* (block 4) predicted all of the outcomes. However, demographic variables predicted the child and family outcomes variables in different ways. Maternal verbal ability predicted every child and parenting variable except for the mental health outcome. Race/ethnicity findings showed that Hispanic children in this sample were vulnerable for lower Bayley and PPVT scores. In many cases, higher levels of a variable at an early age were strongly associated with higher levels later (e.g., Bayley MDI scores at 14 months and Bayley MDI scores at 36 months; overall HOME scores at 14 months and overall HOME scores at 36 months, etc.).

4. Discussion

The current study aimed to identify whether seven measures of parent involvement in home visiting programs assessed unique qualities of home visiting, which characteristics of families predicted those variables and which outcomes for children and families were predicted by the variables, before and after controlling for characteristics of families and controlling for earlier functioning on outcome measures.

The first hypothesis, that participation, quality of engagement and content are distinguishable aspects of home visiting, was generally supported, and was fairly consistent with the conceptual model proposed by Korfmacher et al. (2005). Three of the four quantity variables did relate to one another (excluding length of visit) and the engagement variables related to each other (although overall engagement overlapped with quantity variables), while child-focus tended to operate somewhat independently. Our analyses suggest these three component areas are distinct dimensions of home visiting that are worthy of measurement and attention in future studies.

4.1. Predictors of home visiting components

The study demonstrates the powerful role of demographic and other characteristics as predictors of parent involvement in services and program outcomes. Family characteristics clearly corresponded to variability in program involvement. Staff in home visiting programs have long reported that some families are easier to engage than others, beliefs reflected in the home visiting literature (Daro & Harding, 1999; McCurdy et al., 1996; McGuigan et al., 2003). Thus,

Table 8
Logistic regression: Relations between involvement variables and moderate depression

	Quantity		+Quality		+Child focus		+Demographic	
	b (SE)	e^2	b (SE)	e^2	b (SE)	e^2	b (SE)	e^2
Depression; χ^2 chg.	3.09		18.14***		2.72		30.71***	
Cumulative R^2	(.01)		(.09)		(.11)		(.22)	
Number	−.00 (.01)	1.00	.00 (.01)	1.00	.00 (.01)	1.00	.00 (.01)	1.00
Duration	−.02 (.02)	.98	−.01 (.02)	.99	−.01 (.02)	.99	.02 (.02)	1.02
Intensity	.25 (.21)	1.29	.18 (.22)	1.20	.18 (.22)	1.20	−.02 (.27)	.98
Overall engage			−.52 (.21)	.60*	−.52* (.22)	.59*	−.50 (.24)	.61*
Visit engage			−.74 (.29)	.48*	−.70 (.30)	.50*	−.72 (.34)	.49*
Child focus					−.02 (.01)	.98	−.02 (.01)	.98
White							.82 (.89)	2.56
African American							1.24 (.94)	3.45
Hispanic							.23 (.94)	1.26
Risk							−.08 (.22)	.93
Probably depressed, 14 months							1.93 (.43)	6.90***
Ever moved							.78 (.44)	2.18+

$N = 216$

+ $p \leq .10$.
* $p \leq .05$.
** $p \leq .01$.
*** $p \leq .001$.

as hypothesized, family involvement in home visit programs varied as a result of family characteristics but, also, as hypothesized, family characteristics that predicted involvement were somewhat different across different home visiting components. Taken together, the findings provide a window on how families of different types appear to be experiencing home visiting programs. It was perhaps not surprising that mothers who were single or teens had somewhat less service or that mobile families had a shorter duration in the program. Brookes, Ispa, Summers, Thornburg, and Lane (2006) also note that moving frequently has a negative impact on participation and engagement. Consistent with findings by families who had a child with a disability stayed in the program longer and were rated as more engaged than other families, indicating the program appeared to be meeting needs of these families at the intersection of two systems of care (Early Head Start and Part C). Differences by race/ethnicity in this study are consistent with the literature to some extent (Dumka et al., 1997; Wagner et al., 2003) but also present some new findings. White families received more visits and greater intensity though were not rated as more engaged; however, non-English speaking Hispanics were rated as more engaged in the program than other racial/ethnic groups and black/African American families received less child-focused activity, the latter a finding not previously reported, and potentially important given the relatively strong relationship between the amount of child-focused activity and outcomes. Some of the most important findings of the study for program implications show that mothers more "at risk" received fewer visits and were less likely to be recipients of home visits focused on their children, consistent with the literature (Larner et al., 1992; Wagner et al., 2003) This finding may reflect the relatively greater need these families have for basic family support (e.g., Brookes et al., 2006).

4.2. Parent involvement in home visiting and child and parent outcomes

How parents were able to be involved in program services was related in part to their own characteristics, which in turn, appeared to be related in complex but somewhat predictable ways to child and family outcomes. As hypothesized, even after controlling for many family and child characteristics, the ways that families were involved in the program did appear to relate to outcomes. Specifically child cognitive and language development and parental support for children's language and learning as well as overall home environments were robustly related to the extent of child-focused activity during the home visit. This offers some explanation as to why *some* home visit programs have shown child cognitive/language effects but many have not. Also, mental health was related to general and specific engagement, suggesting that home visitation may be effective in addressing underlying mental health issues of parents (Chaffin, 2004) but also illustrating that the operative component is whether the home visitor is able to successfully engage the mother. The findings are fairly robust, given that controls for earlier levels of depression were entered into the models. However, it was also noteworthy that while child focus and quality of engagement were each significantly related to specific outcomes, quantity of participation only related to outcomes before demographic features were added to the models, with one exception. There was a significant relation found between duration of program involvement and parental support for language and literacy. Certainly, quality of engagement and child focus in the visit are inextricably bound to quantity of visits and these features can only occur within the context of regular home visits. Yet, our findings suggest that quality and content of visits are more strongly related to outcomes than quantity per se and that future research should continue to delve into the how and the what of home visits (see also Gomby, 2005).

4.3. Limitations

Before further discussing implications, it is important to acknowledge some inconsistencies in the findings and caveats for interpretation. First, although we did not derive much value from our measure of home visit length, it would be premature to suggest it is not an important measure. In Early Head Start, visits are intended to be 90 min and in this study, they averaged about 77 min, which remains a respectable visit length. Thus, visit length could be a more substantial predictor under conditions of greater variation. Second, there were lessons learned about measurement in the current study. It may seem more accurate to keep a record of every home visit rather than record quantity based on parent reports (visits were weekly, less than weekly but more than monthly, monthly). However, our analyses show that parent reports were surprisingly close to number of home visits as determined from staff records of individual home visits. Further, and perhaps not surprisingly, the rating of global engagement, appears to measure some subjective "averaging" of both the quality of engagement and quantity of involvement. Thus, while this may be a useful global measure of involvement it also may lack the specificity needed to accurately depict the nature of parent engagement. However, measures completed at the time of each visit appear to provide useful information about engagement and visit focus.

A third and general caveat is that the amount of variance contributed by the parent involvement variables was small compared to variance contributed by demographic factors. At least one variable (parent supportiveness) was not significantly predicted by the home visiting parent involvement variables at all. The current paper did not aim to comprehensively explain variance in child outcomes but rather to determine whether parent involvement factors – those variables that measure components in the home visit – remained differential predictors after controlling for measured parent demographic factors. Such analysis provides impetus for measurement of multiple factors within home visiting programs and begins to disentangle the role of demographic factors in uptake of services from their roles in predicting outcomes. By isolating the roles of program factors in predicting outcomes it becomes increasingly possible to develop realistic program theories of change that will potentially lead to greater effectiveness in designing program services for different population groups to produce desired outcomes. It is important to point out that the variance explained in the current analyses should not be considered variance due to participation in an Early Head Start program as the analyses were only conducted within a program group. There were positive and significant impacts found on children and families participating in the program as determined by comparing the program to a control group (ACF, 2002), across all types and levels of program services. There was one outcome (parent supportiveness) examined that was significant in the Early Head Start experimental design impact study but not significant in the current study that drew upon non-experimental, single-equation techniques not able to control for unobserved measures. It is possible that in the home visiting programs included in the current study, this area was unaffected by any single component of home visiting. It could also be the case that other aspects of services were more important for this outcome, e.g., home visitor skills, child care, referral services, program leadership or implementation, or that other unmeasured characteristics of children or families were important. Or perhaps, the impacts on parent supportiveness were already accounted for in the 14-month assessments that were used as controls in this investigation.

4.4. Implications for policy and practice

Although the controversy about the efficacy of home visiting is well known and on-going (Chaffin, 2004; Gomby, 1999), new analyses (Sweet & Appelbaum, 2004), new efforts and the prevalence of home visiting today (Weiss, 2004) suggest that home visiting as a service delivery mode remains viable. Believing that investment in early intervention is efficacious (Shonkoff & Phillips, 2000), state, federal and private funders necessarily seek the greatest return on investment for intervention dollars aimed at young children in vulnerable circumstances. While some research would appear to suggest investments aimed at children should be in center-based programs, interventions for children under age three have typically included a home visiting component together with a center-based component (Brooks-Gunn et al., 1994; Ramey & Campbell, 1991). Moreover, there is some evidence that home visiting alone can affect children (ACF, 2002; Beckwith, 1988; Sweet & Appelbaum, 2004) and/or provide benefits to parents (ACF, 2002; Daro & Harding, 1999; Olds et al., 1995, 1997, 1998; Wagner & Clayton, 1999). Programs that target both children and parents, especially during infancy, offer funders and families an alternative to center-based interventions. Thus, the current study extends the home visit discussion to the next level by raising questions about what varies within home visiting programs, what can be learned about which families are responsive and more difficult to engage, and how the varying components in visits relate to outcomes. These are important questions when one object of home visiting research is to help programs make improvements so they can more effectively reach their aims.

Our research suggests a number of actions for programs: (1) Measure multiple aspects of home visiting, e.g., number of visits, duration, intensity, overall and visit specific engagement, and the percent of time during that visit devoted to child or parent activity, consistent with the program's theory of change, in order to chart program success in carrying out services and to link service to outcomes. (2) Pay particular attention to engaging families at greatest risk, e.g., perhaps by intentionally assigning experienced home visitors and those with expertise in engaging parents with mental health and other risks. (3) Be aware that families at greatest risk are probably not receiving the child development focus that funders are often particularly interested in and so effects on children may not occur. While child focus was an important ingredient in the current study for child and some parent effects, focusing intently on the child may not be appropriate for families with many mental health and other risk factors, and not dealing appropriately with underlying issues may negate program effects for parents or children (Chaffin, 2004). It is possible that for families at the highest levels of risk, both home visits focused on parents' needs for family support and quality center-based care are necessary ingredients for supporting both children and parents, consistent with the EHS study finding greatest impacts on families who had both center- and

home-based services (ACF, 2002). (4) The previous point notwithstanding, a final implication of the study for programs is to sharpen and refine the child-focused activities within home visits. Child focus seems to be the ingredient that makes a difference in child outcomes and in parenting that pertains to stimulating children's learning.

There are parallel implications of the study for policies aimed at enhancing home visiting as a viable intervention alternative for parents during the prenatal and infant years. It is important for funders to encourage programs to sharpen their focus and to measure the inputs and outputs desired in order to determine for which families the program is reaching its mark and for whom new approaches may need to be found (or who the program perhaps cannot effectively serve). Second, funders may be ready to target interventions for parents of young children with greater demographic and other risk factors, as was also recommended from results of another recent home visiting study (Chaffin, 2004), to help develop new approaches for simultaneously confronting parent issues while providing a safety net for children during the important period of early development. New investments and research may be needed for learning how to best engage parents with more risk factors. Third, the current study also demonstrated that for many parents and children receiving home visiting services, important gains in cognitive and language development and in parents' ability to offer stimulating home environments that notably supported language and literacy were achieved through engagement in the services and receiving child-focused intervention. The implication for policy makers is to help grantees develop increasing rigor in these aspects of service delivery.

Acknowledgements

The findings reported here are based on research conducted as part of the national Early Head Start Research and Evaluation Project funded by the Administration for Children and Families (ACF), U.S. Department of Health and Human Services under contract 105-95-1936 to Mathematica Policy Research, Princeton, NJ, and Columbia University's Center for Children and Families, Teachers College, in conjunction with the Early Head Start Research Consortium. The Consortium consists of representatives from 17 programs participating in the evaluation, 15 local research teams, the evaluation contractors, and ACF. Research institutions in the Consortium (and principal researchers for conducting this research through 36 months of age) include ACF (Rachel Chazan Cohen, Judith Jerald, Esther Kresh, Helen Raikes, and Louisa Tarullo); Catholic University of America (Michaela Farber, Harriet Liebow, Nancy Taylor, Elizabeth Timberlake, and Shavaun Wall); Columbia University (Lisa Berlin, Christy Brady-Smith, Jeanne Brooks-Gunn, and Allison Sidle Fuligni); Harvard University (Catherian Ayoub, Barbara Aleaxander Pan, and Catherine Snow); Iowa State University (Dee Draper, Gayle Luze, Susan McBride, and Carla Peterson); Mathematica Policy Research (Kimberly Boller, Jill Constantine, Ellen Eliason Kisker, John M. Love, Diane Paulsell, Christine Ross, Peter Schochet, Cheri Vogel, and Welmoet van Kammen); Medical University of South Carolina (Richard Faldowski, Gui-Young Hong, and Susan Pickrel); Michigan State University (Hiram Fitzgerald, Tom Reischl, and Rachel Schiffman); New York University (Mark Spellmann and Catherine Tamis-LeMonda); University of Arkansas (Robert Bradley, Richard Clubb, Andrea Hart, Mark Swanson, and Leanne Witeside-Mansell); University of California, Los Angeles (Carollee Howes and Claire Hamilton); University of Colorado Health Sciences Center (Robert Emde, Jon Korfmacher, JoAnn Robinson, Paul Spicer, and Norman Watt); University of Kansas (Jane Atwater, Judith Carta, and Jean Ann Summers); University of Missouri-Columbia (Mark Fine, Jean Ispa, and Kathy Thornburg); University of Pittsburgh (Beth Green, Carol McAllister, and Robert McCall); University of Washington School of Education (Eduardo Armijo and Joseph Stowitschek); University of Washington School of Nursing (Kathryn Barnard and Susan Spieker), and Utah State University (Lisa Boyce, Gina Cook, Catherine Callow-Heusser, and Lori Roggman).

Analyses for this paper were supported by a grant from Harvard University, grantee for the National Home Visiting Forum, and from the E.M. Kauffman Foundation and the Packard Foundation and ZERO TO THREE. The Home Visiting Forum was formed to promote research and collaboration across national programs that provided home visiting services to families.

The content of this publication does not necessarily reflect the views or policies of the Department of Health and Human Services, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

References

Administration for Children and Families. (2002). *Making a difference in the lives of infants and toddlers and their families: The impacts of Early Head Start*. Washington, DC: DHHS.

Aronen, E.,&Kurkela, S. (1996). Long-term effects of an early home-based intervention. *Journal of the American Academy of Child and Adolescent Psychiatry*, *35*, 1665–1672.

Baker, A., Piotrkowski, C., & Brooks-Gunn, J. (1999). The Home Instruction Program for Preschool Youngsters (HIPPY). *The Future of Children*, *9*, 116–133.

Bayley, N. (1993). *Bayley scales of infant development, second edition: Manual*. New York: The Psychological Corporation, Harcourt Brace and Company.

Beckwith, L. (1988). Intervention with disadvantaged parents of sick preterm infants. *Psychiatry*, *51*, 242–247.

Benasich, A. A., & Brooks-Gunn, J. (1996). Maternal attitudes and knowledge of child-rearing: Associations with family and child outcomes. *Child Development*, *67*, 1186–1205.

Birkel, R., & Repucci, N. D. (1983). Social networks, information-seeking, and the utilization of services. *American Journal of Community Psychology*, *11*, 185–205.

Black, M., Nair, P., Kight, C.,Wachtel, R., Roby, P., & Schuler, M. (1994). Parenting and early development among children of drug-abusing women: Effects of home intervention. *Pediatrics*, *94*, 440–448.

Brookes, S., Ispa, J. M., Summers, J. A., Thornburng, K., & Lane, V. (2006). Building successful home visitor–mother relationships and reaching program goals: A qualitative look at contributing factors. *Early Childhood Research Quarterly*, *21*, 25–45.

Brooks-Gunn, J., McCarton, C., Casey, P.,McCormich, M., Bauer, C., Bernbaum, J., et al. (1994). Early intervention in low birth weight, premature infants: Results through age 5 years from the Infant Health and Development Program. *Journal of the American Medical Association*, *272*(16), 1257–1262.

Butz, A., Lears, M., & O'Neil, S. (2001). Home intervention for in utero drug-exposed infants. *Public Health Nursing*, *15*(5), 307–318. Caldwell, B., & Bradley, R. (2003). *Administration manual: Home observation for measurement of the environment*. Little Rock, AR: University of Arkansas at Little Rock.

Chaffin, M. (2004). Is it time to rethink Health Start/Healthy Families? *Child Abuse and Neglect*, *28*, 589–595.

Daro, D., & Harding, K. (1999). Healthy Families America: Using research to enhance practice. *The Future of Children*, *9*, 152–176. Duggan, A., McFarlane, E., Windham, A., Rohde, C., Salkever, D., Fuddy, L., et al. (1999). Evaluation of Hawaii's Healthy Start program. *The Future of Children*, *9*, 66–90.

Dumka, L., Garza, C., Roosa, M., & Stoerzinger, H. (1997). Recruitment and retention of high-risk families: Evaluation of family identification, family engagement, and service delivery. *Pediatrics*, *105*, 250–260.

Dunn, L. M., & Dunn, L. M. (1997). *Peabody Picture Vocabulary Test—Third edition*. Circle Pines, MN: American Guidance Service.

Dunn, L. M., Padilla, E. R., Lugo, D. E., & Dunn, L. M. (1986). *Examiner's manual for the Test de Vocabulario en Images Peabody (Peabody Picture Vocabulary Test) Adaptacion Hispanoamericana (Hispanic American adaptation)*. Circle Pines, MN: American Guidance Service.

Fenson, L., Dale, P. S., Reznick, J. S., Bates, E., Thal, D. J., & Pethick, S. J. (1994). Variability in early communicative development. *Monographs of the Society for Research in Child Development*, *59*(5, Serial No. 242).

Fuligni, A. S., Han, W., & Brooks-Gunn, J. (2004). The Infant-Toddler HOME in the second and third years of life. *Parenting: Science and Practice*, *4*, 139–159.

Gelfand, D., Teti, D., Seiner, S., & Jameson, P. (1996). Helping mothers fight depression: Evaluation of a home-based intervention program for depressed mothers and their infants. *Journal of Clinical Child Psychology*, *25*, 406–422.

Gomby, D. (1999). Understanding evaluations of home visiting programs. *The Future of Children*, *9*, 27–43.

Gomby, D. (2005). *Home visitation in 2005: Outcomes for children and parents* (Working Paper No. 7). Washington, DC: Invest in Kids Working Group.

Gomby, D., Culross, P., & Behrman, R. (1999). Home visiting: Recent program evaluations—Analysis and recommendations. *The Future of Children*, *9*, 4–26.

Guralnick, M. J. (1997). Second-generation research in the field of early intervention. In M. J. Guarlnick (Ed.), *The effectiveness of early intervention* (pp. 3–20). Baltimore, MD: Paul H. Brookes Publishing Co.

Heinicke, C., Fineman, N., Ponce, V., & Guthrie, D. (2001). Relation-based intervention with at-risk mothers: Outcome in the second year of life. *Infant Mental Health Journal*, *22*(4), 431–462.

Heinicke, C., Fineman, N., Rodning, C., Ruth, G., Recchia, S., & Guthrie, D. (1999). Relationship-based intervention with at-risk mothers: Outcome in first year of life. *Infant Mental Health Journal*, *20*(4), 349–374.

Herzog, E. P., Cherniss, D. S., & Menzel, B. J. (1986). Issues in engaging high-risk adolescent mothers in supportive work. *Infant Mental Health Journal*, *7*, 59–68.

Hill, J. L., Brookes-Gunn, J., &Waldfogel, J. (2003). Sustained effects of high participation in an early intervention for low-birth-weight premature infants. *Developmental Psychology*, *39*(4), 730–744.

Home Visiting Forum. (2004, December). *Personal correspondence among members of the forum*.

Jacobson, S., & Frye, K. (1991). Effect of maternal social support on attachment: Experimental evidence. *Child Development*, *62*, 572–582.

Johnson, Z., Howell, F., & Molloy, B. (1993). Community mothers' programme: Randomised controlled trial on non-professional intervention in parenting. *British Medical Journal*, *306*, 1449–1452.

Kazdin, A. E., Holland, L., & Crowley, M. (1997). Family experience of barriers to treatment and premature termination from child therapy. *Journal of Consulting and Clinical Psychology*, *65*, 456–463.

Kazdin, A. E.,&Wassell, G. (1999). Barriers to treatment participation and therapeutic change among children referred for conduct disorder. *Journal of Clinical Child Psychology*, *28*, 160–172.

Kitzman, H., Cole, R., Yoos, H., & Olds, D. (1997). Challenges experienced by home visitors: A qualitative study of program implementation. *Journal of Community Psychology*, *25*(1), 95–109.

Korfmacher, J., Green, B., Staerkel, F., Peterson, C., Cook, G., Roggman, L., et al. (2005). *Parent involvement in early childhood home visiting*. Unpublished manuscript.

Larner, M., Halpern, R., & Harkavy, O. (1992). The fair start story: An overview. In M. Larner, R. Halpern, & O. Harkavy (Eds.), *Fair start for children: Lessons learned from seven demonstration projects* (pp. 3–22). New Haven, CT: Yale University Press.

Lieberman, A., Weston, & Pawl, J. (1991). Preventive intervention and outcome with anxiously attached dyads. *Child Development*, *62*, 199–209.

Love, J., Kisker, E. E., Ross, C., Raikes, H., Constantine, J., Boller, K., et al. (2005). The effectiveness of Early Head Start for 3-year-old children and their parents. *Developmental Psychology*, *41*(6), 885–901.

Luker, K. A., & Chalmers, K. (1990). Gaining access to clients: The case of health visiting. *Journal of Advanced Nursing*, *15*, 74–82.

McCurdy, K., & Daro, D. (2001). Parent involvement in family support programs: An integrated theory. *Family Relations*, *50*(2), 113–121.

McCurdy, K., Hurvis, S., & Clark, J. (1996). Engaging and retaining families in child abuse prevention programs. *The APSAC Advisor*, *9*, 3–8.

McGuigan, W. M., Katzev, A. R., & Pratt, C. C. (2003). Multi-level determinants of mothers' engagement in home visitation services. *Family Relations*, *52*(3), 271–278.

National Committee to Prevent Child Abuse. (1996). *Intensive home visitation: A randomized trial, follow-up and risk assessment study of Hawaii's Healthy Start program* (NCCAN Grant No. 90 CA-1511). Chicago: Author.

National Institute of Child Health and Human Development (NICHD) Study of Early Child Care. (1992). Procedures for videotaping mother–child interaction at 15 month. In *Chapter 15.3 of the NICHD Study of Early Child Care and Youth Development, Phase I Manuals*. Available at http://secc.rti.org/manuals.cfm .

Navaie-Waliser, M., Martin, S., Campbell, M. K., Tessaro, L., Kotelchuck, M., & Cross, A. W. (2000). Factors predicting completion of a home visitation program by high-risk pregnant women: The North Carolina maternal outreach worker program. *American Journal of Public Health*, *90*, 121–124.

Littell, J. H., Alexander, L. B., & Reynolds, W. W. (2001, March). Client parent involvement: Central and underinvestigated elements of intervention. *Social Service Review*.

Olds, D., Eckenrode, J., Henderson, C., Kitzman, H., Powers, J., Cole, R., et al. (1997). Long term effects of home visitation on maternal life course and child abuse and neglect: Fifteen year follow-up of a randomized trial. *Journal of the American Medical Association*, *278*, 637–643.

Olds, D., Henderson, C., Cole, R., Eckenrode, J., Kitzman, H., Luckey, D., et al. (1998). Long-term effects of nurse home visitation on children's criminal and antisocial behavior: 15 year follow-up of a randomized trial. *Journal of the American Medical Association*, *280*, 1238–1244.

Olds, D., Henderson, C., Kitzman, H.,&Cole, R. (1995). Effects of prenatal and infancy nurse home visitation on surveillance of child maltreatment. *Pediatrics*, *95*, 365–372.

Olds, D., & Kitzman, H. (1993). Review of research on home-visiting for pregnant women and parents of young children. *The Future of Children*, *3*, 53–92.

Olds, D., Robinson, J., O'Brien, R., Luckey, D., Pettitt, L., Henderson, C., et al. (2002). Home visiting by paraprofessionals and by nurses: A randomized controlled trial. *Pediatrics*, *110*(3), 486–496.

Olds, D., Robinson, J., Pettitt, L., Luckey, D., Holmberg, J., Ng, R., et al. (2004). Effects of home visits by paraprofessionals and by nurses: Age-four follow-up of a randomized trial. *Pediatrics*, *115*, 1560–1568.

Powell, C., & Grantham-McGregor, S. (1989). Home visiting of varying frequency and child development. *Pediatrics*, *84*(1), 157–164.

Radloff, L. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, *1*, 385–401.

Ramey, C. T., Bryant, D. M.,Wasik, B. H., Sparling, J. J., Fendt, K. H., & LaVange, L. M. (1992). Infant Health and Development Program for low birth weight, premature infants: Program elements, family participation, and child intelligence. *Pediatrics*, *3*, 454–465.

Ramey, C. T., & Campbell, F. (1991). Poverty, early childhood education, and academic competence: The Abecedarian experiment. In A. Huston (Ed.), *Children in poverty: Child development and public policy* (pp. 190–221). NY: Cambridge University Press.

Shonkoff, J., & Phillips, D. (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington, DC: National Academy Press.

Sweet, M., & Appelbaum, M. (2004). Is home visiting an effective strategy? A meta-analytic review of home visiting programs for families with young children. *Child Development*, *75*(5), 1435–1456.

Tamis-LeMonda, C., Shannon, J., Cabrera, N., & Lamb, M. (2004). Fathers and mothers at play with their 2- and 3-year olds: Contributions to language and cognitive development. *Child Development*, *75*(6), 1806–1821.

Van den Boom, D. (1995). Do first year intervention effects endure? Follow-up during toddlerhood of a sample of Dutch irritable infants. *Child Development*, *66*, 1798–1816.

Wagner, M., & Clayton, S. (1999). The parents as teachers program: Results from two demonstrations. *The Future of Children*, *9*, 91–115.

Wagner, M., Spiker, D., Linn, M. I., Gerlach-Downie, S., & Hernandez, F. (2003). Dimensions of parental engagement in home visiting programs: Exploratory study. *Topics in Early Childhood Special Education*, *23*(4), 171–187.

Wasik, B., Ramey, C., Bryant, D.,&Sparling, J. (1990). A longitudinal study of two early intervention strategies: Project CARE. *Child Development*, *61*, 1682–1696.

Weiss, H. (2004). The Home Visit Forum: Understanding and improving the role of home visitation. *Evaluation Exchange*, *X*(2), 19.

Woodcock, R. W., & Munoz-Sandoval, A. F. (2001). *Woodcock-Munoz Language Survey normative update. Picture Vocabulary Test English and Spanish forms*. Itasca, IL: Riverside Publishing.