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Theories of change and outcomes in home-based Early Head Start programs

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ABSTRACT

Programs to promote children's early development are based on a set of assumptions, explicit or implicit, about intended outcomes and how the program will effect change. The "theories of change" were examined in ten home-based programs in the Early Head Start Research and Evaluation Project (EHSREP), using data collected through multiple interviews with program staff. All home-based programs indicated that parenting outcomes were among their highest three priorities, while only 4 of 10 programs said that child outcomes were in their top priorities. The pattern of outcome differences between randomly-assigned program and control group participants reflected the programs' theories of change in several ways. Early Head Start home-based programs showed positive impacts on 9 of 9 parenting outcomes, including parental supportiveness, home language and learning supports, emotional responsiveness, and family conflict when children were 24 months of age. Significant program impacts on child cognitive skills (Bayley MDI scores) and social behavior (observed child engagement of parent during play) were found when children were 36 months of age. Mediation analyses showed that the 54% of the program impact on 36-month child cognitive scores was mediated by 24-month program impacts on parental supportiveness, language and learning support, emotional responsiveness, and family conflict, and 47% of the program impact on 36-month child engagement of parent was mediated by 24-month impacts on parental supportiveness, language and cognitive stimulation, and emotional responsiveness. Results from mediation analyses were consistent with these home-based programs' theories of change, supporting the efficacy of focusing on parent change as a mechanism for child outcomes in home visiting programs.

Guided by evidence that particular aspects of parenting are associated with positive child outcomes (Shonkoff & Phillips, 2000), many practitioners and policy makers believe that helping parents to enhance their parenting can be an effective way to support children's early development. Home-visiting programs are often based on this premise (Brooks-Gunn & Markman, 2005; Sweet & Appelbaum, 2004), and home-visiting program staff members often accept this premise as a working assumption that guides the way their program is implemented. However, despite the fact that many home-visiting program evaluations assess both parenting and child outcomes, sometimes at multiple time points, the question of whether home-visiting program impacts on parenting actually influence later child outcomes has been examined only rarely (Brooks-Gunn, Klebanov, Liaw, & Spiker 1993; Ramey & Campbell, 1984, 1991).

Some home-visiting programs have helped parents increase their knowledge, skills, and attitudes related to parenting, as well as enhance their own well-being in a number of ways (e.g., by reducing maternal depression, reducing and/or delaying subsequent

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births, or increasing education) (Brooks-Gunn, Berlin, & Fuligni, 2000; Fuligni & Brooks-Gunn, 2000; Olds et al., 1997). Also, some home-visiting programs have shown positive child outcomes in various domains: physical (Olds et al., 1999), cognitive and language (Olds et al., 1999, 2004), social–emotional (Heinicke et al., 2001; Olds et al., 2002), and behavioral (Butz et al., 2001; Olds et al., 2004). In general, however, positive impacts on children attributed to home-visiting programs tend to be modest (Black et al., 1994: Gomby, Culross, & Behrman, 1999) or limited to specific subgroups (Olds, Henderson, & Kitzman, 1994; Olds et al., 2002). Home-visiting programs have a long history, but recent evaluations showing limited or modest effects on children's development have prompted closer examination (McCabe & Brooks-Gunn, 2003) and have raised questions about their efficacy (Chaffin, 2004; Gomby et al., 1999; MacDonald, Bennett, Higgins, & Dennis, 2010). Nevertheless, it is possible that home-visiting programs have impacts congruent with the assumptions of the people implementing them, such as the idea that initial positive impacts on parents will lead to later positive effects on children. Analyses focused on both parenting and child outcomes over time could examine this possibility of indirect ormediated impacts and would contribute to a more nuanced picture of how home-visiting programs can affect the early development of vulnerable children. For example, the Nurse Family Partnership Program showed impacts, four years after the program ended, on children's intellectual functioning at age six. These impacts, which had been apparent only in subgroups at younger ages, lead the researchers to conclude that early impacts on parents may have accounted for the enduring program effects (Olds et al., 2002, 2004). The current paper examines the extent to which home visiting impacts on parenting at one point in time mediate later impacts on children's development.

Although some scholars and policy makers are not convinced that helping parents via home-visiting programs will benefit children (Chaffin, 2004; Gomby, 1999), parenting outcomes are often the intended target of infant-toddler program activities, because of the assumptions held by those who design and implement the programs. These ideas program staff members hold, about the changes a program can make and the processes by which those changes should occur, form a program's "theory of change."

Theory of change

A theory of change is a set of statements regarding how and why an initiative is expected to work and what it is intended to accomplish (Weiss, 1995). Examination of these expectations and intentions offers opportunities for more precision in studying the implementation and impacts of home-visiting programs in relation to early child development. As stated above, home-visiting programs often are based on implicit assumptions, whether or not supported by research, about how to make positive changes in children's lives by working with and through parents. Developing an explicit theory of change has been advocated as an important tool for program design and evaluation in community initiatives in general (Kubisch et al., 2002), and in the areas of early childhood and home visiting in particular (Berlin, O'Neal, & Brooks-Gunn, 1998; Roggman, Boyce, & Innocenti, 2008). A written theory of change can provide a concrete description of the pathways through which specified program activities are expected to facilitate processes that lead to intended goals.

A theory of change may have particular utility for assisting home-visiting programs to make their outcome goals, input strategies, and process mechanisms explicit. In contrast to child care or preschool programs (Harms, Clifford, & Cryer, 1998), the specific desired components of a home-visiting program, including the strategies and processes expected to lead to positive outcomes, have not been widely agreed upon, which likely contributes to reported between- and within-program variability in service delivery and outcomes (Hebbeler & Gerlach-Downie, 2002; Sweet & Appelbaum, 2004). Nevertheless, home-visiting programs typically share a common general intent: to work with parents in their homes to support the development of infants and toddlers (Roggman, Boyce, Cook, & Jump, 2001; Sweet & Appelbaum, 2004). However, home-visiting programs use a variety of approaches Some send public health nurses into homes while others send teachers with stimulating toys; some provide information or demonstrate techniques for parents to learn while others engage parents and children in developmental activities; some emphasize language and cognitive development while others emphasize parent responsiveness or positive discipline Roggman et al., 2001).

A clear theory of change for a home-visiting program describes specific outcome goals for parents and children, the processes through which those outcomes are expected to occur, and home visitors' strategies and activities to facilitate these processes. A program's intentions to deliver services via home visits and to target parenting outcomes represent only a very general theory of change. The specific parts of a theory of change include which parenting outcomes to target, what strategies to use with parents, and what processes will link strategies with parenting outcomes and parenting with child outcomes. A theory of change may be assumed even if not stated explicitly; regardless of whether a theory of change is explicit or implicit, a mismatch between program goals and actual program activities can limit program effectiveness (Hebbeler & Gerlach-Downie, 2002; Sweet & Appelbaum, 2004).

Home-visiting programs have been criticized for lacking theoretical and epidemiological grounding and treatment validity (Olds, Hill, Robinson, Song, & Little, 2000), limitations that have been identified as major contributors to weak program effects (Gomby et al., 1999). Another contributing limitation is possible mismatches between program goals and activities; indeed, articulating a theory of change can guide program implementation and evaluation by making the targeted outcomes and planned strategies consistently clear to both program staff and evaluators (Connell & Kubisch, 2001; Weiss, 1995).

As we have noted, in the literature, "home visiting" tends to refer to programs that deliver services to parents and children in children's homes. In the current study, we investigate theories of change in Early Head Start programs that are home-based, the Head Start term for Head Start programs using a home visiting model (United States Department of Health and Human Services, 1996). The Early Head Start Research and Evaluation Project (EHSREP), a multi-site evaluation of newly funded EHS programs, asked staff members in each participating EHS program to articulate their program's theory of change.

The purpose of the current paper is to explore theories of change in EHS home-based programs, examine the extent to which impacts are consistent with the programs' theories of change, and thereby evaluate the efficacy of a theory of change that focuses on parent change as a process mechanism for child outcomes. We examined the theories of change of home-based programs in the EHSREP and then tested whether these programs in fact achieved outcomes consistent with their theories of change. Three research questions guided our work. (1) What are the theories of change developed by home-based EHS programs? We hypothesized that home-based programs would more frequently target parent than child outcomes and that they would view parent outcomes as a pathway to child outcomes. (2) Do impacts of home-based EHS programs reflect outcomes prioritized by their theories of change? Consistent with our first hypothesis, we hypothesized that there would be more parenting impacts early but that more child impacts would emerge later. (3) Do impacts on parent outcomes mediate later impacts on child outcomes? We hypothesized that

parenting impacts when children were 24 months of age would mediate the child impacts at 36 months of age. The data sources are programs' reports of their theories of change collected as part of the EHS Implementation Study (Administration for Children & Families, 2002b) and data collected by the EHSREP (Administration for Children and Families, 2001; Administration for Children & Families, 2002a). The current study is unique from these previous reports because it (a) uses a sample of 10 programs that were delivering home-based services to at least 80% of all program families across the span of family involvement in EHS from enrollment until age 3 when they exited the program (whereas these other reports defined home-based according to program service models when the program began [Administration for Children & Families, 2002b]), (b) conceptually integrates theories of change and outcomes in one paper, and (c) uses maximum-likelihood methods for determining mediation effects (whereas mediation effects in the earlier studies were based on regression methods), thus, more data are included in the analyses.

Method

The EHSREP was a rigorous, experimental design study in which 3001 families, living at or below the poverty level, were randomly assigned to either a program or control group upon enrollment, before children were 12 months old. Participating families lived in 17 different sites around the U.S. and qualified for EHS services at the time of enrollment. The 17 participating sites were geographically diverse and reflective of EHS sites generally in regard to parental demographic characteristics including ethnicity. Ten of these programs offered predominantly home-based services and are the focus of the current study. In these programs, 80% or more of the participating families received home-based services during their years of participation in EHS (potentially, prenatal through child age 3), as was determined by examining family service receipt records during enrollment in EHS. The ten participating home-based programs provided weekly home visits to enrolled families, regularly scheduled group socialization activities for parents and children, and made any needed referrals to other community services. Families in the control group lived in the same communities but were not selected to receive EHS services through the random assignment process, however, they were free to participate in any other services available in their communities for which they qualified.

Participants

The home-based sites provided regular and frequent home visits to families over the course of the evaluation: seven sites offered home-based services to 100% of families, and three, primarily home-based, offered home-based services to 80% or more of the families. This definition of home-based services was determined at the end of the evaluation period when all of the service data from the entire enrollment period could be considered; the definition contrasts with the definition used in the EHSREP evaluation, in which home-based programs were defined by how programs self defined at the *beginning* of evaluation period. The current, more accurate, definition describes services the families actually received.

Table 1 presents demographic descriptions of all EHSREP's participants at home-based sites collected at baseline. The majority of primary caregivers (almost always mothers) at home-based sites were neither employed nor in school (60.8%), nearly half lacked a high school diploma (47%), and about a third were teens when their child was born (35%). There were minimal differences at baseline between program and control group families; of 47 univariate tests to determine differences between the program and control groups, only three were marginally significant at the .10 level (Administration for Children, Youth and Families [ACYF], 2001). Table 1 also contrasts the demographic characteristics of home-based families with those in center-based sites within the EHSREP. Compared with those in center-based programs, families in home-based programs, were less likely to be employed or in school, to be teen moms, or to be African American, but more likely to be receiving cash assistance, living with a husband, or to be white or Hispanic. Thus, families in home-based programs were not representative of all low-income families participating in Early Head Start programs.

Table 1
Baseline demographic characteristics in home-based and center-based sites.

Baseline characteristics	Home-based (10 sites) $n = 1693$[a]	Center-based (7 sites) $n = 1308$	χ^2
Highest grade completed			0.72
<HS	759 (47.0%)	616 (48.5%)	
HS diploma	467 (28.9%)	360 (28.3%)	
HS	390 (24.1%)	294 (23.1%)	
Employment			62.47***
Employed	357 (22.0%)	320 (25.0%)	
In school	278 (17.1%)	353 (27.6%)	
Other	986 (60.8%)	605 (47.3%)	
Teen mother At child's birth	572 (35.0%)	350 (44.6%)	28.15***
Receiving public assistance	507 (37.3%)	335 (32.3%)	6.61**
Household composition			54.47***
Lives with husband	484 (28.7%)	268 (20.6%)	
Lives with others	559 (33.2%)	598 (45.9%)	
Lives alone	643 (38.1%)	437 (33.5%)	
Race			114.03***
White	706 (42.8%)	387 (30.0%)	
Black	447 (27.1%)	573 (44.4%)	
Hispanic	436 (26.4%)	257 (19.9%)	
Other	61 (3.7%)	74 (5.7%)	
At risk for depression	419 (51.3%)	198 (43.2%)	7.62**
Child gender–male	840 (50.5%)	670 (51.7%)	0.44

*$p \leq .05$, **$p \leq .01$, ***$p \leq .001$.
[a] Chi Square analyses n included participants who had data for all the variables in this table.

Measures

Data to describe each program's theory of change were collected during program site visits conducted as part of the EHSREP's examination of program implementation and during twice-yearly Consortium meetings attended by researchers and program staff. Data used in this study to examine parent and child outcomes of home-based EHS programs were collected from observations of parent–child interaction and the home environment, parent interviews, and direct child assessments completed when children were approximately 24 and 36 months of age.

1.1.1. Theories of change

Describing each program's theory of change was an iterative multi-method process, approached at multiple time points over several years. Data collection methods included interviews with program staff during site visits in Years 2 and 4 of the EHSREP, questionnaires completed by program directors, discussions within programs and at Consortium meetings, and discussions with the researchers partnering with each local program. Initially, program staff members at each of the home-based program sites were asked to identify their prioritized intended outcomes and the mechanisms through which program services were expected to have an impact on these outcomes. To guide the process, a list of

possible outcomes was prepared by Mathematica Policy Research. This list included specific outcomes in the areas of child development (social–emotional, language, cognitive, and health); parenting (parent–child relationship, attachment, knowledge of child development, home learning environment, discipline practices, and time spent on parent–child activities such as reading); family functioning (mental health, family conflict) and self-sufficiency (employment, income).

During the Year-2 site visits conducted as part of the EHSREP, data collectors met with groups of EHS staff members and asked them to identify their program's intended outcomes and the mechanisms they would use to achieve these outcomes. During Year-4 site visits, the same data collectors returned, presented the theory of change articulated during the previous site visit, and asked staff members to make revisions as appropriate. In addition, during two Consortium meetings, program directors (often in collaboration with their research partners) identified all the outcomes their program services were expected to affect and then prioritized their top three outcomes. In preparation for these meetings, many program directors and researchers spent long hours in deliberation, conducted staff focus groups, or presented elaborate schematics to illustrate the pathways through which program activities were intended to facilitate targeted outcomes. Generally, programs' prioritized outcomes did not change over time, though outcomes were often articulated with more specificity and the pathways for achieving the outcomes became increasingly differentiated.

These data collection efforts resulted in several sources of information about each program's outcome priorities in their theories of change. To synthesize across these multiple data sources, a grid was constructed to capture identified outcome priorities from the program directors' two ratings of program outcomes made at Consortium meetings, the ratings of outcomes made by staff members during site visits, and a rating completed by an objective researcher who was familiar with all the programs and reviewed data from all the sites for consistency. An outcome was identified as a program priority when it was included in at least three of these four ratings.

1.1.2. Parenting and family well-being outcomes

Several measures were used to capture specific constructs regarding parenting practices as well as parents' reactions to parenting and knowledge about early child development. In addition, parents were asked about family conflict in the home. Parenting and family measures were selected for these analyses because they corresponded to intended outcome priorities in the home-based programs' theories of change. All measures are described in greater detail elsewhere (ACYF, 2001; Administration for Children and Families [ACF], 2002a). High scores on all scales reflect higher levels of the construct.

During visits to families' homes when the children were 24 and 36 months old, observational data of parenting practices were collected. The *Home Observation for Measurement of the Environment* (*HOME*; Caldwell & Bradley, 1984) was completed via observation and interview. Two subscales derived from the HOME scale were used in the current study. Support for Language and Learning at 24 months is a 12-item scale dichotomously scored with a coefficient alpha of .68, and at 36 months, it is a 13-item scale dichotomously scored with a coefficient alpha of .67. Higher scores are indicative of an environment with more books and toys available to the child. The second HOME subscale is the Parental Emotional Responsiveness Scale. For children 24 months of age, 7 items were dichotomously scored with a coefficient alpha of .74; this subscale was not used at child age 36 months.

In addition, parents were asked to involve their children in semi-structured play sessions that were videotaped and then coded on a number of dimensions by a team of trained raters, blind to the treatment status of children and families, using a coding scheme established in previous research (National Institute of Child Health & Development (NICHD) Study of Early Child Care, 1992). The coding dimensions used in the current study included Parent Supportiveness of the child's play (the mean of the score of sensitivity, positive regard and cognitive stimulation; alpha of .82 and .83 over the two waves of data collection) and Parent Detachment during play. Interrater agreement (exact or within one point) was achieved on 11% of the observation tapes and averaged 93% at 24 months, with a range of 84% to 100%, and 94% at 36-months, with a range of 86% to 100% (Berlin, Brady-Smith, & Brooks-Gunn, 2002; Brady-Smith, Fauth, & Brooks-Gunn, 2005; Ryan, Brady-Smith, & Brooks-Gunn, 2004).

Parents' perceptions of and reactions to stress related to parenting were measured at both 24 and 36 months by the 12-item Parent Distress subscale of the *Parenting Stress Index* (*PSI*; Abidin, 1990). Items were scored on a scale from 1 to 5 with an alpha coefficient of .83. Parental knowledge of child development was measured at child age 24 months by a subset (8 of the 75 items) relevant to 2-year-olds from the *Knowledge of Infant Development Scale* (*KIDI*; MacPhee, 1981). Items were scored on a scale of 1 to 4, with an alpha coefficient of .56. While this internal consistency score was lower than those of other measures used in the study, the measure was retained given that several sites specifically named knowledge of child development as a desired outcome in their theories of change. Scores on the *KIDI* have been found to predict child and family outcomes in other samples and there is reason to question why knowledge in one area would be expected to relate knowledge in another area (thus, internal consistency indicated by coefficient alpha might not be relevant; Benasich & Brooks-Gunn, 1996). Family conflict was measured at both 24 and 36 months by the Conflict Scale of the *Family Environment Scale–Family Conflict* (Moos & Moos, 1981) scored from 1 to 4 with an alpha coefficient of .69.

Parents were asked directly about two additional practices during interviews when their children were 24 and 36 months of age. Parents were asked about daily reading, how frequently they read to their children (e.g., daily, several times a week, several times a month, or rarely) and also about physical punishment, whether the child had been spanked in the past week.

1.1.3. Child development outcomes

Child outcomes selected for these analyses correspond with the outcomes home-based programs prioritized in their theories of change: child cognitive, language, and social–emotional development. The key measures for each of these areas used in the EHSREP were selected for this study. For complete information about the measures, see the evaluation reports (ACYF, 2001; ACF, 2002a). Trained and certified data collectors using standardized protocols collected all child outcome data used in the current analyses during assessments when children were 24 and 36 months of age.

Children's cognitive development was assessed with the *Mental Development Index (MDI)* of the *Bayley Scales of Infant Development-Second Edition* (Bayley, 1993). Language development was based on receptive vocabulary assessed with the *Peabody Picture Vocabulary Test—Third Edition* (*PPVT-III;* Dunn & Dunn, 1997). *Examiner's Manual for the Test de Vocabulario en Imagenes Peabody (Peabody Picture Vocabulary Test) Adaptacion Hispanoamericana (Hispanic-American Adaptation;* Dunn, Padilla, Lugo, & Dunn, 1986) scores were collected for children whose primary language was Spanish but these scores are not reported here due to a small number of cases. Raw scores for the MDI and the PPVT-III were converted to age-adjusted standardized scores with a mean of 100 and standard deviation of 15. Social–emotional development was based on two of the child dimensions from the observed and coded videotapes of the parent–child play sessions: Child Engagement of Parent and Sustained Attention to Objects. These were scored from 1 to 7, with high scores indicative of higher levels of child engagement or

attention (Berlin, Brooks-Gunn, & Aber, 2001; Brady-Smith, 2004; Brady-Smith et al., 2005; Ryan et al., 2004). Social behavior problems were assessed by parent report on the 19-item *Aggressive Behavior Subscale* of the *Child Behavior Checklist* for ages 2.2–5 years (Achenbach & Rescorla, 2000). Parents rated their children's behavior on items from 0 (never) to 2 (often) on this subscale, with an alpha coefficient of .87.

Results

We used a three-step analytic approach in response to the research questions. First, we examined descriptive data about the home-based programs' theories of change to identify their targeted outcomes and intended process mechanisms. Next, we compared the program and control groups for parenting and child outcomes when children were 24 and 36 months of age to assess whether the patterns of program impacts from the home-based program sites were consistent with their theories of change. Third, we conducted regression analyses to examine whether impacts on child cognitive and social emotional development at age 36 months were, in fact, mediated by earlier impacts on parents when the children were age 24 months, as would be suggested by our hypotheses about home-based programs' theories of change.

Theories of change in home-based Early Head Start programs

Home-based programs generally selected parenting outcomes for their primary intended outcomes and presented theories of change emphasizing a belief that supporting parents and parenting would lead to positive child outcomes later. Table 2 shows that every one of the home-based programs prioritized parenting outcomes. If a specific outcome was identified as a high priority for a site, based on three of the four rating methods as detailed above, an "X" appears in the column indicating that outcome. Parenting outcomes were selected by all of the home-based programs while child outcomes (three social emotional and one cognitive development) were selected by only four of these 10 programs. The home-based EHS programs, such as the one in the example described earlier, stated that the mechanism by which child outcomes would be affected was expected to be through improvements in parenting, specifically in parents' responsiveness and developmental supportiveness. Six of the 10 home-based programs also prioritized self-sufficiency, and two of the 10 home-based programs prioritized mental-health outcomes.

Programs' theories of change tended to become more specific over time. We provide examples from field notes documenting the theories of change process in one home-based program. This home-based program initially identified "stronger families" as the outcome goal. Staff in this program believed that the parents in the program would "feel confident in their parenting skills and abilities" and that, as a result, the babies would become "more secure and smarter." However, when asked, how exactly the program would make that happen, they described only a general mechanism of social support through program activities. Later, however, they identified a more specific mechanism of change "through a nurturing, supportive, reinforcing relationship between parents and [home visitors]" that was 'strengths-based, partnership-based, and individualized' and through play activities during home visits designed to promote parents' 'nurturing behavior, responsiveness, and knowledge about child development.'" They revised their outcome goals to be more targeted toward parenting: to increase "positive parent-infant interactions" to "improve the quality of the context" for children's exploration and learning, to improve the responsiveness of parents to "support children's secure attachment," and to expand parental knowledge about child development to help parents "build a nurturing home" and "foster infant development."

In this example, the home-base program's descriptions of strategies also became more specific, shifting toward an active intervention process with home visiting activities that required "direct play interactions to enhance the parent–child relationship," to "encourage and support the attendance and participation of the male figure in the child's life at the home visits," and to plan home visits "in collaboration with parents." Program materials described a specific strategy: "You need to guide, then step back and let the parent do. If the parent gets stuck, then guide again, and then step back." They believed that by using this strategy to facilitate parent-infant interactions during home visits they could "encourage [parents in] reading cues, understanding temperament, [appreciating] the uniqueness of their child, and having fun with their child through play" and "becoming the best possible parent that they can be to their child." Like other home-based programs, this program expected that these outcomes in parents would then foster overall child development.

Staff in another program described the importance of fostering parents' ability to "communicate" with their children. They stated that engaging parents in activities with their children during home visits provided opportunities for them to help parents learn to understand their children's cues, respond to their children in a sensitive manner, and enjoy interacting with their children. They believed these interactions would build a foundation for meaningful communications with their children as they grew.

Table 2
Outcome priorities for home-based programs ($n = 10$).

Site	Child outcomes	Parenting outcomes	Self sufficiency outcomes	Maternal mental health outcomes
1	X	X		
2		X	X	
3		X	X	
4	X	X	X	
5		X	X	
6	X	X	X	
7		X		
8	X	X		X
9		X		
10		X	X	X
Total	4/10	10/10	6/10	2/10

Note: The Number of Xs per site differs because sites had multiple options within these broad categories. If, e.g., a site's top targeted outcomes were all focused on Parenting, then there would only be one X in the chart for that site.

Program impacts on parents and children

The impacts of EHS home-based programs on parent and child outcomes when the children were 24 months and 36 months of age (Tables 3 and 4) were tested based on the experimental design of the EHSREP in which families were randomly assigned to a program group or a control group. Analyses of impacts from these EHS home-based program were conducted using an analytic approach adopting the same control variables that were used to estimate the overall EHS impacts in the EHSREP (for details on the analytic approach, see ACF, 2002a). However, the impacts for the current analyses were conducted with MPlus 5.0 and used Full Information Maximum Likelihood (FIML) estimation for missing data. Impacts of these 10 home-based EHS programs were estimated by comparing the means on outcome measures for the program and control groups across these sites. Control variables, collected at baseline before families were randomly assigned to program or control groups, described family and child characteristics. Control variables included mothers' age, ethnicity, English-language ability, education level, primary occupation, and living arrangements; number of children in the household; poverty level, welfare receipt, and

Table 3
Home-based EHS impacts on parenting outcomes at child ages 24 and 36 months.

Parent outcome	Child age 24 months; $n = 1875$			Child age 36 months; $n = 1875$		
	Program mean (SD)	Control mean (SD)	Impact effect size[a]	Program mean (SD)	Control mean (SD)	Impact effect size[a]
Parent supportiveness[b]	4.13 (1.04)	3.92 (1.02)	.21***	4.04 (0.92)	3.88 (0.92)	.17*
Parent detachment[b]	−1.35 (0.73)	1.53 (.950)	−.18**	1.20 (0.53)	1.27 (0.62)	−.11
Language and learning support[b]	10.37(1.61)	10.13 (1.76)	.13*	10.81 (1.83)	10.63 (1.95)	.09
Emotional responsiveness[b,c]	6.40 (1.07)	6.23 (1.25)	.13*			
Parent distress	24.80 (8.92)	26.53 (9.44)	−.17**	25.01 (9.65)	26.39 (9.67)	−.14*
Knowledge of child development[c]	3.41 (0.40)	3.33 (0.45)	.17**			
Family conflict	1.67 (0.53)	1.74 (0.58)	−.17*	1.67 (0.56)	1.71 (0.54)	−.07
[d]Daily reading	57.0%	43.0%	.06*	56.3%	43.7%	.03
[d] Physical punishment	46.6%	53.4%	.05	45.2%	54.8%	−.08**

*$p < .05$, **$p \leq .01$, ***$p \leq 001$.
Note.
[a] The impact effect size represents the proportion of standard deviation difference between group means accounted for by the home-based EHS program.
[b] Parent supportiveness, detachment, language and literacy support, and emotional responsiveness were measured primarily by observation; all other variables by self-report only.
[c] Emotional responsiveness and knowledge of child development were not measured at 36 months.
[d] Chi-square test was used to test group differences (program vs. control) for daily reading and physical punishment. Phi, the effect size for chi-square test, was calculated using the formula $\phi = \sqrt{\frac{\chi^2}{N(k-1)}}$, N is the total sample size in each analysis, K is the number of the rows or columns ($k = 2$ in the present analyses).

adequacy of resources; previous enrollment in another child development program; mobility during the previous year; exact age of child at random assignment and at the time of the parent interview or child assessment; low birth weight status; and child's gestational age, gender, and risk categories. In addition, nine dummy coded variables were used to control for site of the 10 home-based programs. Impacts were estimated per eligible applicant (the intent-to-treat sample).

Table 3 shows that, consistent with their theories of change, the home-based EHS programs were successful in affecting a broad range of parenting outcomes when the children were 24 months old. Parents participating in these programs, compared to those in control groups in the same communities, demonstrated greater levels of supportiveness during play, provided more emotional responsiveness and more support for language and learning in the home environment, demonstrated greater knowledge of child development, and read to their children more often. Also, they demonstrated less detachment during play and reported less frequent physical punishment, parenting distress, and family conflict (9 of 9 parenting variables). Some of these impacts remained when the children were 36 months old. At that time, parents receiving EHS home-based services, compared with parents who were in the control group, were observed as significantly more supportive and reported less parenting distress and less frequent physical punishment (3 of 7 parenting variables).

Table 4 presents the pattern of impacts on child development outcomes at the home-based sites when children were ages 24 and 36 months. There were positive impacts at age 36 months on child cognitive development and on child engagement of parent during play. There had not been significant effects on these variables at age 24 months, consistent with the programs' theory of change that impacts on children would appear later than impacts on parenting.

Mediation of home-based EHS child impacts by earlier parent impacts

A central question of this study was whether earlier program impacts on parenting mediated later impacts on children. Structural Equation Modeling (SEM) was used to investigate this question. Parent variables that showed significant program impacts by child age 24 months were tested as potential mediators (nine parenting variables) of the effects of the EHS program on child cognitive scores and child engagement of parent during play interactions at 36 months.

A bootstrapping approach was used to assess whether the total and specific indirect effects were significant. The variables examined as possible mediators of child impacts at 36 months were those parental variables that showed program impacts at 24 months (See Table 3). These included parental supportiveness in play, detachment in play, home language and literacy support, emotional responsiveness, parental distress, knowledge of child development, and family conflict (single-item indicators of daily reading and physical punishment were not included). There were two dependent variables, which were the two child outcomes at age 36 months for which there was a home-based EHS program impact (See Table 4): Bayley MDI cognitive scores and child engagement of parent during play. The question posed by the mediation analysis was whether the impacts (difference between program and control groups) on 24-month parenting variables significantly mediated the impacts on 36-month child outcomes across all 10 of these

Table 4
Home-based EHS impacts on child outcomes at ages 24 and 36 months.

Child outcome	Child age 24 months; $n = 1875$			Child age 36 months; $n = 1875$		
	Program mean (SD)	Control mean (SD)	Effect size of impact[a]	Program mean (SD)	Control mean (SD)	Effect size of impact[a]
Cognitive skills	91.09 (13.90)	89.74 (13.85)	.09	94.01 (11.96)	92.43 (12.02)	.12*
Vocabulary[b]				85.05 (16.51)	83.56 (16.51)	.09
Child engagement	4.38 (1.10)	4.25 (1.14)	.11	4.84 (1.00)	4.66 (1.03)	.16*
Sustained attention	5.13 (0.95)	5.03 (0.90)	.11	4.98 (0.93)	4.89 (.96)	.09
Aggressive behavior[c]	12.57 (6.82)	13.23 (6.70)	−.10	11.13 (6.44)	11.39 (6.44)	−.04

*$p < .05$, **$p \leq .01$.
Notes:
[a] The impact effect size represents the proportion of standard deviation difference between group means accounted for by the home-based EHS program.
[b] PPVT was administered only at 36 months and only to English-speaking children (86% of those tested).
[c] Aggressive behavior was measured by maternal report; all other child outcomes were measured by direct assessment or observation.

Table 5
Correlations between parent variables at 24 months and child variables at 36 months.

Parenting at 24 months	Child cognitive skills at 36 months (n = 799–915[a])	Child engagement at 36 months (n = 835–935[a])
Parent supportiveness	.29***	.32***
Parent detachment	−.17***	−.19***
Emotional responsiveness	.19***	.19***
Language and learning support	.30***	.22***
Daily reading	.18***	.05
Physical punishment	−.01	−.06
Parent distress	−.12***	−.12***
Knowledge of child development	.13***	.12***
Family conflict	−.14***	−.08*

*$p \leq .05$, **$p \leq .01$, ***$p \leq .001$.
[a] Sample sizes due to instrument completion, and are generally lower for videotaped observations and higher for parent report.

home-based programs who shared the general theory of change that early impacts on parenting would account for outcomes for children at a later date. Table 5 shows the relations between the parent variables at 24 months and child variables at 36 months.

The parent variables were tested simultaneously as mediators of the effect of the EHS program on children's Bayley MDI cognitive scores and on child engagement of parent at age 36 months, in separate analyses for the two independent variables. A single multiple mediation model was used, instead of separate simple mediation models, for three reasons (Preacher & Hayes, 2008). First, the involvement of multiple mediators within one model can determine whether an overall effect exists. If the overall effect is found, researchers can conclude that the set of variables mediates the effect of the independent variable on the dependent variable; Second, it can tell us to what extent one specific variable mediates the effect of the independent variable on the dependent variable, conditional on the presence of other mediators in the model; Third, in a single model with multiple variables as mediators, the likelihood of parameter bias, due to omitted potential mediating variables, is reduced (Preacher & Hayes, 2008).

A bootstrapping approach was used for assessing whether the total and specific indirect effects were significant or not. Compared to the delta method, which has been used in Sobel's test, the advantage of the bootstrapping approach is that it does not assume multivariate normality of the sampling distribution of the total and specific indirect effects (Preacher & Hayes, 2008). To bootstrap the sampling distribution of the specific and total indirect effects, a sample size of n cases is replaced for the original sample. The path coefficients from independent variables to the mediators, and the ones from the mediators to the dependent variables are re-estimated using this new sample, and then the indirect effects are calculated (Preacher & Hayes, 2008). This process was repeated 1000 times in the present analysis. Thus, we attained 1000 estimates of the total and specific indirect effects. The distributions of these 1000 estimates serve as empirical, nonparametric approximations of the sampling distributions of the total and specific indirect effects (Preacher & Hayes, 2008); 95% bootstrap Confidence Intervals (CIs) of the total and specific indirect (mediated) effects were reported. This analytic approach was used to test the joint mediation effect of all the potential mediating variables together and also test the effects of specific mediators. These analyses were calculated using regression models with Full Information Maximum Likelihood (FIML) estimation for missing data.

In addition to the mediators presented above, all models included the same controls as the impact analyses. The following were covariates: mothers' age, ethnicity, English-language ability, education level, primary occupation, and living arrangements; number of children in the household; poverty level, welfare receipt, and adequacy of resources; previous enrollment in another child development program; mobility during the previous year; exact age of child at random assignment and at the time of the parent interview or child assessment; low birth weight status; and child's gestational age, gender, risk categories; and 9 dummy coded variables used to control for site of the 10 home-based programs. Results are reported to two decimal places to better illustrate differences where absolute values are low. All analyses were conducted using the Intent to Treat Sample (ITT).

The set of parental variables that showed program impacts at 24 months significantly mediated the effect of home-based EHS programs on children's Bayley MDI at age 36 months. Table 6 shows the total mediating effect of the entire set of parental variables as well as the specific mediating effect of each parent variable. For child cognitive skills at 36 months, the total mediating effect was significant as were four of the specific parent variables: Parental supportiveness in play, home language and literacy support, emotional responsiveness, and family conflict at 24 months. For child engagement of parent at age 36 months, the total effect of the set of 24-month parental mediators was significant as were the specific mediators of parental supportiveness in play and home language and literacy support.

Discussion

Home-based EHS program staff members in this study believed that their programs were targeting parenting outcomes primarily and, within child outcomes, social–emotional more than cognitive outcomes. The stronger emphasis on parenting in home-based programs implies a theory of change based on the assumptions that an infant-toddler program can have its strongest and most important impacts by influencing parenting and that the program's impacts on parenting will, in turn, enhance children's development. Indeed, some programs explicitly described this process in their theories of change. If home-visiting programs rely upon a theory of change that parent outcomes will lead to child outcomes, what evidence supports this assumption?

This study examined the extent to which program impacts were consistent with the basic assumption of these home visiting programs' theories of change. Because EHS home-based programs consistently targeted parenting outcomes, we tested whether later impacts on children could be traced to earlier impacts on parents. We were able to test the study questions because we could rely upon the experimental design of the EHSREP (ACF, 2002a) and measurement of both parent and child impacts at two points in time, when children were 24 and 36 months of age.

These home-based EHS programs had positive impacts on many parenting variables measured when the children were 24 months and on some parenting variables measured when the children were 36 months of age. These findings show that the parenting outcomes prioritized by home-based programs were the outcomes most likely to show program impacts, especially early in the program, as expected from their theories of change and consistent with the home-visiting literature (Brooks-Gunn et al., 2000; Fuligni & Brooks-Gunn, 2000; Olds et al., 1997).

Direct effects on children have been less common in home-visiting programs (MacDonald et al., 2010; Sweet & Appelbaum, 2004); that pattern was observed in our study as well, when children were age two. By the time the children were age three, however, a significant impact on one social emotional variable (child engagement of parent during play) was observed, consistent with the theory of change guiding many home-based programs and other research on home visiting (Heinicke et al., 2001). Somewhat surprising was an impact on cognitive skills at age three, not emphasized in the home-based programs' theories of change to the

Table 6
Mediated effects of home-based EHS 24-month parenting impacts on 36-month child impacts.

24-Month parent mediator of program impact[a]	Estimated mediated effect on 36-month child cognitive skills; $n = 1875$	95% Bootstrap confidence intervals	Percentage of the total program impact on 36-month child cognitive skills accounted by mediator	Estimated mediated effect on 36-month child engagement; $n = 1875$	95% Bootstrap confidence intervals	Percentage of the total program impact on 36-month child engagement accounted by mediator
Parent supportiveness[b]	0.42*	0.16–0.76	27.6%	0.05*	0.02–0.09	29.4%
Parent detachment[b]	0.01	−0.16–0.21	0.7%	0.00	−0.02–0.03	0
Language and learning support[b]	0.16*	0.03–0.43	10.5%	0.01*	0.00–0.03	5.9%
Emotional responsiveness[b]	0.14*	0.01–0.41	9.2%	0.01*	0.00–0.04	5.9%
Parent distress	0.01	−0.15–0.14	0.7%	0.01	−0.01–0.03	5.9%
Knowledge of development	−0.08	−0.27–0.01	−5.3%	−0.00	−0.02–0.01	0
Family conflict	0.17*	0.05–0.42	11.2%	0.01	−0.00–0.03	5.9%
Total	0.82*	0.40–1.38	53.9%	0.08*	0.04–0.14	47.1%

*Significant mediating variables are those for which 95% CIs do not include 0.
The direct effect of program on 36-month child cognitive skills was 0.70; the direct effect of program on 36-month child engagement was 0.09.
Note.
[a] Parental variables that showed program impacts at 24 months (Table 3) were examined as possible mediators of program impacts on child outcomes at 36 months (single-item indicators of daily reading and physical punishment were not included). Dependent variables were the two child outcomes at age 36 months for which there was a home-based EHS program impact (Table 4): Bayley MDI cognitive scores and child engagement of parent during play. The estimated effect size represents the percent of home-based EHS program impact on child outcomes accounted for by the parent mediator. A bootstrapping approach was used to assess whether the total and specific indirect effects were significant.
[b] Parent supportiveness, detachment, language and literacy support, and emotional responsiveness were measured primarily by observation; all other variables by self-report only.

same extent as social emotional outcomes. Cognitive impacts in the home-visiting literature have been reported inconsistently (Black et al., 1994; Howard & Brooks-Gunn, 2009; Jones Harden, Chazan-Cohen, Raikes, Vogel, & the EHS Home Visitation Research Team, 2012; Olds et al., 2002, 1994). The current findings demonstrate that home-based programs had positive impacts on children's development in both social and cognitive domains, but not until after impacts on parenting had emerged, consistent with findings of Olds et al. (2002) and a result that is often assumed, but rarely empirically tested.

We demonstrated, as well, that program impacts on parenting outcomes when children were age two mediated the impacts of these programs on child development outcomes at age three. That is, it was through earlier effects on parenting that home-based EHS programs' had positive impacts on children's development at age three. Home-based EHS impacts on children's social–emotional development, as reflected in their engagement with parents during social play, were mediated by earlier impacts on parents and parenting, notably by parent supportiveness in play and parent emotional responsiveness. Slightly under half (47%) of the impact on child engagement was mediated by the earlier impact on these parenting variables when the children were 24 months of age. Similarly, positive impacts on responsive and supportive parenting mediated the effects of another intervention program on reducing aggression in young children at risk for externalizing behavior problems (Brotman et al., 2009). These characteristics of parenting have also been found to be related to children's social–emotional development in previous research (Bernier, Carlson, & Whipple, 2010; Caspi et al., 2004; De Wolff & van Ijzendoorn, 1997; Gardner, Ward, Burton, & Wilson, 2003; Harnish, Dodge, & Valente, 1995; Repetti, Taylor, & Seeman, 2002), particularly among children at high risk for poor outcomes due to impoverished environments (Shonkoff, 2010; Shonkoff & Phillips, 2000).

Home-based EHS program impacts on children's cognitive development were also mediated by earlier program impacts on parenting, specifically, parents' supportiveness in play, their support of children's language and learning, their emotional responsiveness, and less family conflict. Many of these parenting factors have been shown to be associated with children's cognitive development in previous studies (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Farah et al., 2008; Hubbs-Tait, Culp, Culp, & Miller, 2002; Kelly, Morisset, Barnard, Hammond, & Booth, 1996; Landry, Smith, Miller-Loncar, & Swank, 1997; Maccoby & Martin, 1983; NICHD Early Child Care Research Network, 1999, 2000; Petrill & Deater-Deckard, 2004; Smith et al., 1996; Walker, Chang, Powell, & Grantham-McGregor, 2006), but parenting has only rarely been tested as a mediator of early intervention impacts on children's early cognitive development (Guralnick, 2011). Over half (54%) of the program impact on cognitive development when children were 36-months was mediated by impacts on these parenting factors at 24 months.

The mediators of home-based EHS impacts were similar for both cognitive and social emotional development; this suggests that the mechanisms through which parenting impacts child outcomes may be quite similar across developmental domains at these young ages. Interestingly, home-based EHS programs most frequently targeted parenting variables in their theories of change, and impacts on both parent supportiveness and parental responsiveness predicted the significant child development impacts of these programs. About half of these programs targeted enhancing the home learning environment; the importance of this focus was validated as the impacts on language and learning support that parents provided in their home environments mediated the child outcomes. Few of these programs had targeted reduction in family conflict specifically, but impacts on family conflict also mediated impacts on children's cognitive development. Thus, programs may want to consider broadening their focus to include family conflict reduction as a pathway to improving children's early cognitive development.

Some aspects of parenting that showed early impacts did not mediate home-based impacts on children's development: parenting distress, knowledge of child development, and detachment. Perhaps reducing parents' negative experiences of parenting and providing information about development do not increase parents' support of their children's development. In contrast, the parenting impacts that did mediate child impacts were parenting behaviors that would be expected to have more direct influence on the child's development: parent's supportiveness during play interactions and responsiveness to children's emotions, and for child cognitive development, parent's ongoing support for children's early language and literacy development. Detachment would

also be expected to influence children, but was seen rarely in the observed interactions, as indicated by the low mean value. The specific parenting variables that mediate home visiting impacts on early child development suggest that home visitors could focus more on these kinds of parenting behaviors as a means to increase home visiting impacts on children's development.

These findings confirmed an anticipated pattern of impacts on parenting and child developmental outcomes, although overall, the findings were more modest than many would hope. Several explanations for modest impacts are plausible. First, not all the home-based programs were fully implemented at the beginning of the EHSREP. Indeed, a subset of these programs never reached full implementation as defined by the researchers (ACF, 2002b). Findings from the EHSREP demonstrated that high program implementation contributed substantially to program impacts, both across all program types and within home-based programs, with fully implemented EHS programs having much broader and stronger impacts on positive outcomes than programs that were fully implemented later or never (ACF, 2002b; Jones Harden et al., 2012) The current findings demonstrate that home-based programs had positive impacts on children's development, but not until after impacts on parenting had emerged.

Second, family participation in and intensity of home-based services varied both across and within programs, as has been documented across multiple studies of home-visiting programs (Sweet & Appelbaum, 2004). Much work is needed to document the actual intervention experiences of families participating in home-visiting programs. Describing a program as home-visiting often provides very little information about specific ways that program staff members interact with families and may mask variation in how each program uniquely addresses parents' needs, parenting, and children's development, mechanisms which are not examined in the current study. In order to understand the specific pathways through which program activities facilitated the positive parent and child impacts found here (e.g., greater parent knowledge of child development, more parental supportiveness in play, and better child cognitive and social development), careful planning of program implementation and documentation of home visiting strategies are needed. Strategies are likely to vary among home-visiting programs depending on how each balances the focus on parent and child. Strategies are also likely to vary among families within the same programs, depending on parent involvement in the home visits, the family's constellation and home environment, and the training of the home visitor. Larger impacts would be expected as programs sharpen their theories of change, implement their strategies accordingly, adapt systematically to individual families, evaluate parent and child outcomes, and use this information to refine program implementation on an on-going basis (Roggman et al., 2008).

These analyses revealed 2 additional points worthy of note. The impacts on parenting were stronger and more pervasive when the children were two years of age than when they were age three. This may be due to the fact that as children approached age three, a number of families began transitioning out of the home-based EHS programs into community child care and preschool centers, although they remained in the EHSREP (ACF, 2002a, 2003, 2004). However, the child impacts did not decrease, and in fact, we were able to identify child outcomes at age three that had not been seen at age two. These findings further underscore the need for early child development programs to clarify their designed balance of parent- and child-focused activities, their planned strategies intended for home visit activities, and the actual pathways through which program activities are expected to effect change.

Fidelity to their theoretical models is likely to help home visiting programs maximize their impact (Howard & Brooks-Gunn, 2009). By clarifying their theory of change, staff members in home-based child development programs can make their outcome goals and planned services to reach those goals more explicit. They can then more readily describe the specific activities and strategies they intend to implement within each service and describe the indicators that can be used to monitor progress toward targeted goals for parenting and child development. Administrators can then use the descriptions of intended program activities to identify the knowledge and skills most likely to help service providers do their jobs effectively and to plan appropriate staff recruitment, training, and supervision. Supervisory staff can monitor parent and child outcome indicators and actual program activities and use this information to implement effective staff support and supervision. A clear theory of change can thereby guide programs designed to promote children's early development toward more successful program outcomes on parents and children. In one of the home-based EHS programs in this study, the director noted that as the program staff developed a theory of change, "administrators began to communicate with staff on a regular basis about the theory of change. We narrowed our focus to what we were really trying to do with our program. As we became more focused, the difference began showing in improved interventions and services" (Thurgood, 2001 p. 74).

A program's theory of change also provides an important guide to researchers who test the potential of developmental support services to influence children's early development. First, a concrete theory of change explicates the assumptions underlying program goals and guiding program activities, and if clear in terms of intended processes and outcomes, will point to appropriate measures for intended outcomes and appropriate indicators of the quality and quantity of specific program activities (Howard & Brooks-Gunn, 2009; Kubisch et al., 2002; Roggman et al., 2008). For example, one of the home-based programs identified secure attachment as a targeted child development outcome. Although the national evaluation did not measure any indicators of security, local research focused on just that one program showed impacts on security scores (Roggman, Boyce, & Cook, 2009). A program's theory of change can also facilitate accurate interpretations of program implementation and outcome data, promote continuous program improvement, and guide wise policy decisions. Communication between program staff and program evaluation researchers can be clarified with an explicit theory of change. Again, in one of these home-based EHS programs, "Because we did this [developed a theory of change] in collaboration with the researchers, they also understood the inside strategy of the program, what we were trying to do and how we intended to do it. Our goals, objectives, and outcomes became clearer and more in line with each other" (Thurgood, 2001, p 74).

Data presented here demonstrate the potential utility of examining variables and links between them, as implied by a program's theory of change. Hebbeler and Gerlach-Downie (2002) conducted a detailed qualitative investigation of the theory of change that implicitly guided services in a different infant-toddler home visiting program that did not show significant impacts on children's development even though that had been a key program goal. They concluded that the program's theory of change was "flawed"; despite the fact that enhancing parenting and parent–child interactions were key goals, home visitors overemphasized their role of providing social support for the parent at the expense of serving as a facilitator of improved parenting. The researchers concluded that the program's effectiveness was limited by this inconsistency between the program's stated goals for parents and children and their implicit theory of change.

Despite the usefulness of examining theories of change in home visiting programs, the research team members acknowledge facing several challenges in conducting this study and encourage future researchers to extend this work. Identifying indicators of programs' theories of change and reliable data sources to match those indicators presented the first set of challenges. We elicited goals and

strategies that were part of programs' theories of change in several ways on multiple occasions and based our data sources on the outcomes targeted explicitly by program staff members. Other ways to identify indicators of programs' theories of change might include a content analysis of program documentation or written plans, discussions about the theory of change with parents in the program, or perceptions about the program's purpose and activities elicited from community collaborators. Increasing numbers of programs are developing explicit logic models to illustrate their theory of change and inform program evaluation efforts. Similarly, a clear understanding of a program's theory of change could facilitate the selection of research measures to capture key process features and outcomes, thus allowing for more definitive judgment regarding whether and how specific strategies were used and the relative effectiveness of those strategies for effecting intended outcomes. Efforts such as these are needed to guide refinement of a variety of early child development programs, especially home-visiting programs, where pathways to intended outcomes often have not been explicitly hypothesized, documented, or tested.

An extensive research literature suggests that center-based programs providing services directly to children can provide direct routes to child outcomes, both in the short and long term (Benasich, Brooks-Gunn, & Clewell, 1992; Magnuson & Waldfogel, 2005; Ramey & Campbell, 1991; Ramey & Ramey, 1998), particularly when the focus is on cognitive outcomes. Our results show that home-visiting programs providing services by working with parents in their homes affect child outcomes via indirect routes.

To learn more about how home-visiting programs can promote early development, research efforts need to reflect the theories of change underlying them. The current study contributes by systematically examining the most general premise of home-visiting programs: that earlier impacts on parenting do, in fact, lead to later effects on children. Our results provide support for the validity of this premise and suggest that home visiting is not simply an alternative way to deliver services to *children*. Rather, home-visiting programs offer a unique approach—in purpose, outcomes, and pathways—to enhance parenting behaviors that support children's early development. It is important to evaluate these programs according to their purposes, to test both parent and child outcomes, and to examine both direct and indirect pathways to those outcomes. Sharpening the focus of programs' theories of change and examining the fidelity of their implementation may increase the probability that home-visiting early childhood programs will achieve their intended aims.

Today, as the new Federal initiative on home visiting (Maternal, Infant and Early Childhood Home Visiting Program) progresses to implementation, studies such as the one we have presented here become useful for fine tuning home visiting research purposes and differentiating outcomes aligned with purposes. For the most part, states implementing the new program have selected evidence-based program models (the Early Head Start model is among the models considered to demonstrate an evidence base; see Avellar & Paulsell, 2011; Paulsell, Avellar, Sama, Martin, & Del Grosso 2010). However, as we have illustrated, the evidence base is still in a young stage and adding theory of change work can tighten research designs by better fitting program intentions to measurable outcomes. While we acknowledge the theory of change focus in this report was at a broad level (emphasizing the programs' focus on parenting as mediator for child outcomes), we see the potential for more fine-grained identification of intention and aligned assessment. Thus, while the home-visiting literature can support a limited evidence base, there is considerable opportunity ahead to examine the mechanism by which home visiting programs effect change as the field expands under the new Federal home visiting initiative.

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