EARLY HEAD START

RESEARCH

Making a Difference in the Lives of Infants and Toddlers and Their Families: The Impacts of Early Head Start

Volume II: Final Technical Report Appendixes

U.S. Department of Health and Human Services
Administration for Children and Families
Office of Planning, Research and Evaluation
Child Outcomes Research and Evaluation
Administration on Children, Youth and Families
Head Start Bureau

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Volume II: Final Technical Report Appendixes

June 2002

Child Outcomes Research and Evaluation
Administration for Children and Families
And the Head Start Bureau
Administration on Children, Youth and Families
Department of Health and Human Services

Early Head Start Evaluation Reports

Leading the Way: *Describes the characteristics and implementation levels of 17 Early Head Start programs in fall 1997, soon after they began serving families.*

Executive Summary (December 2000): *Summarizes Volumes I, II, and III.*

Volume I (December 1999): *Cross-Site Perspectives—Describes the characteristics of Early Head Start research programs in fall 1997, across 17 sites.*

Volume II (December 1999): *Program Profiles—Presents the stories of each of the Early Head Start research programs.*

Volume III (December 2000): *Program Implementation—Describes and analyzes the extent to which the programs fully implemented, as specified in the Revised Head Start Program Performance Standards, as of fall 1997.*

Pathways to Quality and Full Implementation (spring 2002): *Describes and analyzes the characteristics, levels of implementation, and levels of quality of the 17 Early Head Start programs in fall 1999, three years into serving families. Presents an analysis of the pathways programs followed to achieve full implementation and high quality.*

Building Their Futures: How Early Head Start Programs Are Enhancing the Lives of Infants and Toddlers in Low-Income Families: *Presents analysis of the impacts that the research programs have had on children's development, parenting, and family development through 2 years of age.*

Summary Report (January 2001): *Synopsis of the major findings.*

Technical Report (June 2001): *Detailed findings and report on methodology and analytic approaches.*

Special Policy Report on Child Care in Early Head Start (summer 2002): *Describes the nature, types, and quality of child care arrangements in which Early Head Start and control group children enrolled, and presents implications for public policy.*

Special Policy Report on Children's Health in Early Head Start (summer 2002): *Describes health services received by Early Head Start and control group families.*

Making a Difference in the Lives of Infants and Toddlers and Their Families: The Impacts of Early Head Start (June 2002): *Presents analysis of the impacts that the research programs have had on children's development, parenting, and family development through the children's third birthday (including two to three years of program participation).*

Reports Are Available at:

http://www.acf.dhhs.gov/programs/core/ongoing_research/ehs/ehs_intro.html

http://www.mathematica-mpr.com/3rdLevel/ehstoc.htm

Prepared for:

Rachel Chazan Cohen, Helen Raikes, Louisa Banks Tarullo,
And Esther Kresh
Child Outcomes Research and Evaluation
Office of Planning, Research and Evaluation
Administration for Children and Families
U.S. Department of Health and Human Services
Washington, DC

Prepared by:

Mathematica Policy Research, Inc.
Princeton, NJ
Under Contract DHHS-105-95-1936

Authors:

John M. Love
Ellen Eliason Kisker
Christine M. Ross
Peter Z. Schochet
Mathematica Policy Research, Inc.

Jeanne Brooks-Gunn
Columbia University
Center for Children and Families

Diane Paulsell
Kimberly Boller
Jill Constantine
Cheri Vogel
Mathematica Policy Research, Inc.

Allison Sidle Fuligni
Christy Brady-Smith
Columbia University
Center for Children and Families

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APPENDIX A

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- Xtria (formerly Ellsworth Associates)
- Early Head Start National Resource Center
- Center for Children and Families, Columbia University Teachers College
- Mathematica Policy Research
- Early Head Start evaluation Technical Work Group
- Others

[1]Within each group, names are listed alphabetically.

A. EARLY HEAD START RESEARCH PROGRAMS[2]

Jana Gifford and JoAnn Williams
Child Development, Inc. (University Affiliated Program of Arkansas)
Russellville, Arkansas

Manuel Castellanos, Jr., Ana Friendly, and JoEllen Tullis
The Children First Early Head Start (University of California, Los Angeles)
Venice, California

Lereen Castellano and Terry Hudgens
Family Star Early Head Start (University of Colorado Health Sciences Center)
Denver, Colorado

Mitzi Kennedy, Charmaine Lewis, Meera Mani, and Adele Phelan
Clayton/Mile High Family Futures, Inc. Early Head Start (University of Colorado Health Sciences Center)
Denver, Colorado

Susan Fessler, Mary Pepper, Kathie Readout, and Kate Smith
Mid-Iowa Community Action, Inc. Early Head Start (Iowa State University)
Marshalltown, Iowa

Martha Staker
Project EAGLE Early Head Start (University of Kansas)
Kansas City, Kansas

Mary Cunningham DeLuca, Shelly Hawver, Marsha Kreucher, and Martha York
Community Action Agency Early Head Start (Michigan State University)
Jackson, Michigan

Evelyn Givens, Mary K. Ross-Harper, and Shirley Stubbs-Gillette
KCMC Early Head Start (University of Missouri at Columbia)
Kansas City, Missouri

Rosa Agosto, Iris Fuentes, Barbara Greenstein, Wanda Marquez, and Audrey Neuhaus
The Educational Alliance, Inc. (New York University)
New York, New York

Vivian Herman, Laurie Mulvey, and Flora Woratshek
University of Pittsburgh Early Head Start (University of Pittsburgh)
Pittsburgh, Pennsylvania

[2]The program's local research partner is indicated in parentheses.

Anita E. Kieslich
School District 17 Early Head Start (Medical University of South Carolina)
Sumter, South Carolina

Wesley Beal, Naomi Bridges, Pamela Castleman, and Eric DuPree
Northwest Tennessee Early Head Start (Mathematica Policy Research)
McKenzie, Tennessee

Valdi Lofthouse, Glenna Markey, and Sarah Thurgood
Bear River Early Head Start (Utah State University)
Logan, Utah

Lynn Milgram Mayer, Denise Mitchell, Stanley Pryor, and Cynthia Roberts Samples
United Cerebral Palsy Early Head Start (The Catholic University of America)
Fairfax County, Virginia

Kathleen Emerson, Susan James, Judith Jerald, and Mary Moran
Early Education Services Early Head Start (Harvard University)
Brattleboro, Vermont

Jose De Leon, Enrique J. Garza, Frances Love, and Carlos Trevino
Washington State Migrant Council Early Head Start (University of Washington College of Education)
Sunnyside, Washington

Pakhi Chaudhuri, Leslie Keller, Sharon Osborn, Peg Mazen, and Margaret McKenna
The Children's Home Society of Washington Families First Early Head Start (University of Washington School of Nursing)
South King County, Washington

B. LOCAL EARLY HEAD START RESEARCH TEAMS[3]

Robert Bradley, Richard Clubb, Mark Swanson, and Leanne Whiteside-Mansell
University Affiliated Program of Arkansas (Child Development, Inc.)
Little Rock, Arkansas

Debra Castelan, Claire Hamilton (University of Georgia), Carollee Howes, Shira Rosenblatt, and Jane Wellenkamp, University of California (Children First Early Head Start)
Los Angeles, California

[3]The local program partner is indicated in parentheses.

Robert N. Emde, Jon Korfmacher (Erikson Institute), Norman F. Watt (University of Denver), Jeffrey K Shears, JoAnn Robinson, and Paul Spicer
University of Colorado Health Sciences Center (Family Star and Clayton/Mile High Family Futures)
Denver, Colorado

Diane Draper, Sarah French Howard, Gayle Luze, Susan McBride, and Carla Peterson
Iowa State University (Mid-Iowa Community Action, Inc.)
Ames, Iowa

Jane Atwater, Judith J. Carta, and Jean Ann Summers
University of Kansas (Project EAGLE)
Kansas City, Kansas

Holly Brophy-Herb, Hiram Fitzgerald, Cynthia Gibbons, Sharon Hoierr, Dennis Keefe, Mildred Omar, Tom Reischl (University of Michigan), and Rachel F. Schiffman
Michigan State University (Community Action Agency Early Head Start)
East Lansing, Michigan

Mark Fine, Jean Ispa, Gary Stangler, and Kathy Thornburg
University of Missouri at Columbia (KCMC Early Head Start)
Columbia, Missouri

Poonam Ahuja, Lisa Baumwell, Tonia Cristofaro, Zenobia Cummings, Tracy Poon, Gladys Gonzales-Ramos, Joanne Roberts, Eileen Rodriguez, Jacqueline Shannon, Elizabeth Spier, Mark Spellmann, Catherine Tamis-LeMonda, and Maria Yarolin
New York University (Educational Alliance, Inc.)
New York, New York

Beth Green, Chris Keane, Carol McAllister, and Robert McCall
University of Pittsburgh (University of Pittsburgh Early Head Start)
Pittsburgh, Pennsylvania

Michael Brondino, Richard Faldowski, Gui-Young Hong, and Susan G. Pickrel
Medical University of South Carolina (School District 17)
Charleston, South Carolina

Lisa Boyce, Catherine Elwell, and Lori Roggman
Utah State University (Bear River Early Head Start)
Logan, Utah

Harriet Liebow, Lawrence Rudner, Christine Sabatino, Nancy Smith, Nancy Taylor, Elizabeth Timberlake, Shavaun Wall, and Michaela L. Zajicek-Farber
The Catholic University of America (United Cerebral Palsy Early Head Start)
Washington, DC

Catherine Ayoub, Barbara Alexander Pan, and Catherine Snow
Harvard Graduate School of Education (Early Education Services Early Head Start)
Cambridge, Massachusetts

Eduardo Armijo and Joseph Stowitschek
University of Washington, College of Education (Washington State Migrant Council)
Seattle, Washington

Kathryn E. Barnard, Michelle Deklyen, Colleen Morisset-Huebner, Joanne Solchany, and Susan Spieker
University of Washington, School of Nursing (Children's Home Society of Washington)
Seattle, Washington

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California: Farnaz Benyamini, Sophia Robles, Shira Rosenblatt
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South Carolina: Stephanie Burns, Rebecca Ferris Regan
Tennessee: Barbara Schiff
Utah: Kay Hansen
Vermont: Brenda Kennedy, Barbara Pan
Virginia: Nancy Smith
Washington, Sunnyside: Romie Guillen
Washington, Kent: Anthippy Petras

D. FEDERAL AGENCIES

Administration on Children, Youth and Families

Head Start Bureau

Mary Bogle
Adrienne Bridgeman
Robin Brocato
Jeff Fredericks
Frankie Gibson
Denice Glover
JoAnn Knight Herren
Windy Hill
Robin Brocatoss
Frankie Gibson
Denice Glover
Judith Jerald
Mimi Kanda
Douglas Klafehn
Esther Kresh
Ann Linehan
James O'Brien
Edgard Perez
Michelle Plutro
Madelyn Schultz
Tom Schultz
Willa Chopper Siegel
Mary Shiffer
Jean Simpson
Helen Taylor
Craig Turner
Sarah Younglove

ACYF Fellows

Gina Barclay-McLaughlin
Senobia Crawford
Brenda Jones Harden
Carole Kuhns

Commissioner's Office

Gail Collins
James Harrell
Patricia Montoya
Joan Ohl
Deborah Roderick Stark

Administration for Children and Families

Wade Horn
Olivia Golden
Joan Lombardi

ACF, Office of Planning, Research and Evaluation

Naomi Goldstein
Richard Jakopic
Howard Rolston

Child Outcomes Research and Evaluation

Rachel Chazan Cohen
Michael Lopez
Helen Raikes
Louisa Banks Tarullo

Office of the Assistant Secretary for Planning and Evaluation

Linda Mellgren
Martha Moorehouse

National Institute of Child Health and Human Development

Natasha Cabrera
Jeffrey Evans
Michael Lamb

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Lillian Sugarman

West Ed Center for Children and Family Studies

Ronald Lally
Peter Mangione

F. XTRIA

Danielle Buente
Cheryl Clark
Angela Ingram-Jones
Kara King Walsh
Jennifer Maahs
Carolyn Swaney

G. CENTER FOR CHILDREN AND FAMILIES, COLUMBIA UNIVERSITY TEACHERS COLLEGE

Research Staff

Lisa J. Berlin (now at Duke University)
Jeanne Brooks-Gunn
Allison Sidle Fuligni
Veronica Holly

Videotape Coding and Supervision

Rebecca Fauth
Magdalena Hernandez
So-Yun Lee
Rebecca Ryan

Videotape Coding, Development, and Supervision

Christy Brady-Smith

Videotape Management and Coding

Wanda Garcia
Claudia O'Brien

Videotape Coding Development

Mary Byrne
Jeanne L. McHale
Colleen O'Neal
Margaret Owen
Anne Ware

Videotape Coding and Data Entry

Kimber Bogard
Yaowen Chang
Evelyn Crow
Cricket Crutcher
Robin Kappel
Katie MacLennan
Marcia Mann
Elizabeth Mathews
Isobel Ortiz
Jennifer Porter
Elizabeth Rigby
Missy Rohrbach
Elizabeth Salick
Ariel Shanok
Laura Stout Sosinsky
Radha Sripathy
Jennifer Weiner

H. MATHEMATICA POLICY RESEARCH

Word Processing and Administrative Support

Doreen Ambrose
Lynne Beres
Connie Blango
Chris Buchanan
Monica Capizzi
Kathy Castro
Jennifer Chiaramonti
Debbie Ellis
William Garrett
Gloria Gustus
Cathy Harper
Dave Jefferys
Scott McCarthy
Cindy McClure
Jill Miller
Marjorie Mitchell
Jane Nelson
Shawn Newland
Lisa Puliti
Jan Watterworth

Editorial Support

Laura Berenson
Walter Brower
Patricia Ciaccio
Roy Grisham
Joanne Pfleiderer

Researchers

Kimberly Boller
John Burghardt
Jill Constantine
Kathleen Coolahan
Mark Dynarski
Ellen Eliason Kisker
John M. Love
Lorenzo Moreno
Diane Paulsell
Linda Rosenberg
Christine Ross
Peter Z. Schochet
Cheri Vogel

Programmers

Jigar Bhatt
Ruo-Jiao Cao
Dexter Chu
Jennifer Faerber
Joshua Hart
Miriam Loewenberg
Alyssa Nadeau
Tim Novak
Ben Shen
Rachel Sullivan
Xiaofan Sun

Systems Analysts

Anne Bloomenthal
John Mamer
Barbara Koln
Michael Watt

Research Analysts

Jeanne Bellotti
Sheila Hoag
Alicia Meckstroth
Charles Nagatoshi

Survey Operations

Data Operations Coordination

Susan Sprachman, Survey Director (1995 – 1998)
Welmoet van Kammen, Survey Director (1998 – 2001)
Cheryl De Saw, Assistant Survey Director

Site Liaisons

Bea Jones
Linda Mendenko
Margo Salem
Barbara Schiff

Training Support Staff

Martina Albright
Lisa Baumwell
Amy Damast
Emily Doolittle
Dayana Jimenez
Tiffany Miller

Survey Operations Staff

Season Bedell-Boyle
Kathleen Candelaria
Marietta Corallo
Sharon De Leon
Chake Dereyan
William Ebron
David Eden
Betty Friedman
Linda Genzik
Susan Golden
Amy Levy
Beverly McCarthy
Jennifer McNeill
Rosiland Page
Rachel Reed
Phyllis Schanck
Cindy Steenstra
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Andrea Sleeper
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Mark Appelbaum, University of California—San Diego
Gina Barclay-McLaughlin
Hedy N. Chang, California Tomorrow
Tom Cook, Northwestern University
Eugene Garcia, University of California, Berkeley
Kathleen M. Hebbeler, SRI International
Judith Jerald, Early Education Services Early Head Start[4]

[4]Ms. Jerald resigned from the TWG when she assumed the Early Head Start program leadership position at ACYF in fall 1999.

Judith Jones, Columbia University
Sharon Lynn Kagan, Yale University
Marie McCormick, Harvard School of Public Health
Suzanne Randolph, University of Maryland

J. OTHERS

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Margaret Burchinal, University of North Carolina
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Martha Cox, University of North Carolina
Debby Cryer, University of North Carolina
Donna Bryant, University of North Carolina
Philip Dale, University of Missouri-Columbia
Carl Dunst, Orelena Hawks Puckett Institute
Byron Egeland, University of Minnesota
Larry Fenson, San Diego State University
Nathan Fox, University of Maryland
Barbara Friesen, Portland State University
Frank Furstenberg, University of Pennsylvania
James Gyurke, The Psychological Corporation
Thelma Harms, University of North Carolina
Ronald Kessler, Harvard Medical School
John J. McArdle, University of Virginia
Samuel Meisels, University of Michigan
Ron Mincy, Columbia University
Robert Moffitt, Johns Hopkins University
David Olds, Colorado Health Science Center
Joy Osofsky, Louisiana State University School of Medicine
Margaret Owen, University of Texas at Dallas
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Robert Pianta, University of Virginia
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John Richters, University of Maryland
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APPENDIX B

DATA COLLECTION, SOURCES OF NONRESPONSE, AND FATHER STUDY RESPONSE RATES

B.1 DATA COLLECTION

a. National and Local Research Roles

The national contractor team (MPR and Columbia) was responsible for all aspects of preparation for data collection, tracking of interview status, data entry, quality control, coding of interview responses, coding of parent-child interaction videotapes, and data analysis. Preparation for data collection included nominating evaluation measures, creating and distributing interviews, writing operations and training manuals, conducting centralized training sessions for staff from all 16 sites (2 programs were located in one city, so one research team conducted the data collection for both), certifying that data collectors met the quality and reliability standards set for each measure, providing assessment materials, and notifying local data collection teams when families were to be interviewed. MPR's tracking of interview status included requiring the local teams to send biweekly updates on the data collection status of families with open interview "windows," working with the sites to assist in locating hard-to-reach families, and conducting regular telephone meetings with the sites to review the biweekly reports.

In addition to conducting their own research, the local research teams were responsible for hiring a site coordinator as the key person to work with MPR on the cross-site data collection, hiring data collectors, locally supervising the data collection team, conducting all interviews and assessments, tracking interview status, and sending the data to MPR for processing. Sites decided how they staffed the data collection, and data collection team personnel varied, with some staff members working full-time and some part-time. We began with two data collection roles at each site: (1) interviewer/assessors (IAs) were hired with the primary responsibility of conducting the birthday-related parent interviews, child assessments, and parent-child videotaped assessments; (2) community/family coordinators (CFCs) were designated to conduct the

follow-up parent services interviews using the Computer-Assisted Personal Interviewing (CAPI) technique. Individuals with a variety of experiences assumed data collector roles, including graduate students, professional interviewing staff, and members of the local community. In some sites the site coordinators collected data themselves, and in other sites they did not.

b. Interviewer Training, Certification, and Reliability

Interviewer Training. The national team conducted group training for local research staff members (site coordinators, CFCs, and IAs) who conducted the Parent Services Interviews (PSI), Parent Interviews (PI), and Child and Family Assessments. Training sessions for the 6-month PSI, the 14-month PI, and the 14-month Child and Family Assessments were conducted in August 1996 and during several smaller sessions throughout the first year of data collection to accommodate different data collection schedules at the sites, as well as to respond to staff turnover. Training sessions were approximately 3 days long for CFCs conducting the 6-month PSI, and 5 days long for IAs conducting the 14-month PI and the Child and Family Assessments. Site coordinators conducted all the 15- and 26-month PSI training locally. In July 1997, we conducted a four-day training session for the 24-month PI and Child and Family Assessments. Representatives from each site were required to attend. The site coordinators conducted all subsequent 24-month training locally. For all centralized training sessions, we asked CFCs and IAs to review the training manual prior to training and prepare to participate in group lectures and discussions, hands-on practice, and taping of practice administrations. All 36-month PI and Child and Family Assessment training was conducted at the local research sites by the site coordinators. MPR prepared training materials and videotapes and site coordinators worked with IAs to train staff and prepare them for certification.

Interviewer Certification and Reliability. After training, we required CFCs and IAs to conduct practice interviews and assessments and submit audiotapes or videotapes to the national

team for certification. The mode of administration, initial certification requirements, and ongoing reliability procedures for each type of interview are described in this section.

- **Parent Services Interview.** CFCs conducted the PSIs by CAPI. Most of the interviews were conducted by telephone, but CFCs visited families in their homes if a telephone interview was not possible. CFCs were required to practice using CAPI with nonrespondents and conduct a mock interview with their site coordinator. The site coordinator reviewed the completed interview on the computer and sent an audiotape of the practice interview and the diskette containing the interview data to MPR for review. CFCs were certified to collect data from respondent families if the mock interview was administered correctly. If a CFC was not certified on their first attempt, we asked them to practice and conduct another mock interview until they met the certification requirements. After a CFC was certified, site coordinators monitored every fifth interview until the CFC reached her/his 25th. Beyond the 25th interview, site coordinators monitored one audiotaped interview every month and one live interview every 6 months.

- **Birthday-Related Measures.** IAs conducted the 14-, 24-, and 36-month PI and the family and child assessments (including the Bayley II, the parent-child videotaped assessments, the MacArthur CDI, PPVT-III, TVIP, and a modified version of the HOME) in the families' homes. Most of the birthday-related interviews and assessments were conducted in the homes, but if the parent was unable to conduct the interview and assessments in her/his home, the IA conducted the PI by telephone and tried to complete the assessments at a different time. The interviews and assessments were conducted using paper-and-pencil questionnaires.

  Bayley Scales. After the 14- and 24-month central training sessions and the 36-month local training, IAs were required to critique and score a videotaped Bayley administration and score a second administration to practice what they learned during training. A team of Bayley trainers and reviewers (expert consultants from New York University) provided feedback on the practice exercises. IAs were asked to practice the Bayley and the videotaped parent-child protocol with families who were not part of the evaluation.

  After a minimum of two practice administrations, IAs submitted a videotaped Bayley administration, a self-critique, the score sheet, and the completed behavior rating scale for review. The Bayley trainers and reviewers provided written feedback for two administrations per IA and determined whether the IA met our certification criteria of 85 percent reliability on administration and scoring. If an IA did not meet the certification criteria, he/she was asked to practice and resubmit. All IAs were required to meet the certification requirements before they collected data with study children. To ensure reliability of administration, IAs were required to videotape every 15th Bayley and submit it and a self-critique to MPR for review. Our Bayley trainers and reviewers found that most IAs met the certification criteria throughout data collection. If an IA did not, he/she was asked to review the feedback from the reviewer and conduct another Bayley with a child who was not part of the study.

Usually the IA did not require more than one practice administration to reestablish reliability for the Bayley administration and scoring.

Parent-Child Videotaped Assessments. After training and practice with at least two families who were not part of the evaluation, IAs were required to submit one videotape to MPR for review. A team of experts from MPR and Columbia reviewed the tapes and scored the interviewer on the administration of the protocol instructions, timing of the activities, and videography. IAs were certified to collect data with study families if they met the certification criteria established by the review team. If an IA did not meet the criteria, he/she was asked to submit another practice tape and self-critique for review. The review team provided feedback to IAs about the video protocol for approximately every 15th administration.

PPVT-III/TVIP. As part of the local 36-month training, IAs studied the PPVT-III and the TVIP. They completed practice scoring exercises and were asked to conduct practice administrations with adults and with children who were not part of the research. Site coordinators were asked to monitor practice administrations and determine whether the IA met the criteria for certification. MPR staff members reviewed the scoring for the first two administrations each IA completed and provided feedback as necessary.

Other Measures. As part of the field monitoring of the practice administrations of the PI, Bayley, and videotaped assessments, the site coordinators determined whether the IAs were certified on the PI, which included the MacArthur CDI (completed at 14 and 24 months by the parent as a self-administered questionnaire or administered by the interviewer according to the parent's preference) and the modified version of the HOME. To determine whether IAs were ready to conduct the interviews and assessments with study families, site coordinators were asked to assess the flow of the interview, transitions between components of the PI and the assessments, rapport with family and child, and completeness and accuracy of the interview and assessment documents.

- **Father Study Interview.** Twelve of the 17 research sites participated in the father study. Eleven of the sites conducted the 24- and 36-month father interview and one site conducted an abbreviated interview. The father interview was administered after the PI was completed with the child's primary caregiver. The primary caregiver (the mother in over 96 percent of the families) identified whether the biological father lived with the child or saw the child regularly. If the biological father did not live with the child, the IA determined whether there was a father figure. If the mother identified both an involved nonresident biological father and a father figure, the IA asked the mother which man was more involved with the child. If the mother did not object to having the father contacted, the IA reported to the site coordinator that there was an identified father and MPR began tracking the father as a respondent for the father study. In some sites, the same team of IAs conducted the father interviews and other sites hired new IAs. The site coordinator and certified IAs in each site conducted father interview training. Father study IAs were required to submit audiotapes of the father interview for review by the national team. Father study IAs had to meet the same certification and reliability standards as the IAs in the main study.

Father-Child Videotaped Assessments. After training and practice with at least two fathers who were not part of the evaluation, IAs were required to submit one videotape to MPR for review. A team of experts from MPR and Columbia reviewed the tapes and scored the interviewer on the administration of the protocol instructions, timing of the activities, and videography. IAs were certified to collect data with study fathers if they met the certification criteria established by the review team. If an IA did not meet the criteria, he/she was asked to submit another practice tape and self-critique for review. The review team provided feedback to IAs about the video protocol for approximately every 15th administration.

Data collectors were not informed of families' program status; however, if families shared information that revealed their program status or kept Early Head Start materials in their homes, data collectors may have learned of some families' status by the time of the final assessments.

c. Data Collection Windows, Tracking, and Receipt Control

Data Collection Windows. Site coordinators were required to monitor the data collection window for each family for all the interviews and assessments. MPR generated contact sheets and advance letters for every family and sent them to the sites. The contact sheet included contact information for the family, the dates between which the interview was to be completed (the "window"), space to code the status of the interview, and space to record attempts to reach the family. All windows opened 4 weeks before the target date of the interview (targeted for 6, 15, and 26 months after random assignment for the PSIs, and the date of the child's 14-, 24-, and 36-month "birthday" for the birthday-related interviews and assessments). See Table B.1 for the target length of the windows by type of interview.

Timing of Interviews/Assessments by Child's Age and Months Since Random Assignment. Table B.2 gives a summary of the distribution of months between the target date and the completion of the 26-month PSI and the 36-month PI by research status. On average, the 26-month PSI was conducted about 28 months after random assignment, and the 36-month PI

TABLE B.1

EHS DATA COLLECTION WINDOW BY TYPE OF INTERVIEW/ASSESSMENT

Data Collection Instrument	Window
6-Month PSI (Parent Services Interview)	5 months to 11 months and 30 days
14-Month PI (Birthday Related Parent Interview)	13 months to 19 months and 30 days
14-Month Parent-Child Videotaped Assessments and Bayley	13 months to 16 months and 30 days
15-Month PSI	14 months to 22 months and 30 days
24-Month PI/Parent-Child Videotaped Assessments and Bayley	23 months to 28 months and 15 days
24-Month Father Interview/Father-Child Videotaped Assessments	23 months to 31 months and 30 days
26-Month PSI	25 months to 33 months and 30 days
36-Month Parent-Child Videotaped Assessments, Bayley, and PPVT-III	35 months to 38 months and 30 days
36-Month Father Interview/ Father-Child Videotaped Assessments	35 months to 43 months and 30 days

TABLE B.2

DISTRIBUTION OF THE NUMBER OF MONTHS BETWEEN INTERVIEW TARGET DATES AND COMPLETION OF KEY INTERVIEWS, BY RESEARCH STATUS
(Percentage)

	26-Month Parent Service Interviews			36-Month Parent Interviews		
Number of Months	Program Group	Control Group	Combined Sample	Program Group	Control Group	Combined Sample
–3 to –1	2.3	1.0	1.6	2.2	2.6	2.4
–1 to –.5	9.1	7.4	8.2	10.5	11.9	11.1
–.5 to 0	8.6	11.2	9.9	12.1	11.3	11.7
0 to .5	12.5	11.3	11.9	13.3	13.3	13.3
.5 to 1	9.6	9.9	9.7	10.2	11.7	10.9
1 to 2	16.4	16.3	16.3	19.8	16.6	18.3
2 to 3	9.3	12.1	10.7	15.6	15.6	15.6
3 to 4	6.9	8.2	7.6	8.1	7.7	7.9
4 or Greater	25.3	22.7	24.0	8.2	9.6	8.9
Average Number of Months	2.3	2.5	2.4	1.4	1.4	1.4

was conducted when the children were 37 months old (overall there were no differences by research status).

Tracking of Interview Cooperation Rates. When the interview window was open, MPR and the site coordinators worked together to develop strategies to increase interview completion rates. Site coordinators reported interview status to MPR and participated in phone meetings with MPR staff members to review data collection issues and update tracking information. For interviews that were difficult to complete or families that were hard to locate, the site coordinator requested assistance from MPR that included the search of locating data bases and telephone or, in some sites, field support from a trained MPR specialist in locating families.

Receipt Control. Completed birthday-related interviews and assessments were reviewed by site coordinators and any data edits were conducted at the site as necessary before the materials were sent to MPR. Site coordinators sent regular shipments to MPR of CAPI diskettes containing the PSIs, originals of the PI, and videotapes. MPR staff logged the materials into the tracking database and prepared the interview and assessment materials for data entry.

d. Data Processing, Data Entry, and Quality Control

Data Processing. MPR staff copied the parent-child videotapes and sent them to the Columbia University team for coding. MPR and the site coordinator compared logs of materials sent by the sites and received by MPR to ensure that all the data had been received. CAPI diskettes were downloaded and included in a database organized by a unique family identification number. To protect families, any documents that included both the family identification number and the family contact information were kept in locked files.

Data Entry and Quality Control. Prior to data entry, all paper-and-pencil instruments were reviewed by quality control staff for any problems with the skip logic and other interview administration errors. All paper-and-pencil instruments were data entered with 100 percent

verification into data entry programs with prescribed ranges for each item. For the PSIs, automatic range checks and skip patterns were part of the CAPI programming to reduce data collection and data entry errors. For questions that required or provided an option for the parent to specify her/his response, we recoded responses or developed codes to classify responses and included them as additional values if 10 or more respondents gave the same answer.

B.2 SOURCES OF NONRESPONSE

All multisite evaluations of the size and complexity of Early Head Start face a variety of data collection and analytic challenges that affect the overall and site-level response rates. This study is no different. Overall response rates, response rates by site and by data source, and response rates by evaluation subgroups are presented and discussed in Chapter II. Here we describe the nature of the nonresponse.

The primary sources of nonresponse were refusals to participate and inability to locate the families. Overall for the 15-month PSI, 45 percent of the families who did not respond refused to participate, and 49 percent moved or could not be located (the remaining 6 percent included families for whom the interview window closed before the interview was completed. For the 24-month PI, 51 percent of the families who did not respond refused to participate, and 44 percent moved or could not be located (the remaining 5 percent included families for whom the interview window closed before the interview was completed). Overall for the 26-month PSI, 41 percent of the families who did not respond refused to participate, and 52 percent moved or could not be located (the remaining 7 percent included families for whom the interview window closed before the interview was completed). For the 36-month PI, 46 percent of the families who did not respond refused to participate, and 51 percent moved or could not be located (the remaining 3 percent included families for whom the interview window closed before the interview was completed).

In addition to these more typical sources of nonresponse, unfortunately 21 children died during the course of the study (12 children in the control group, and 9 in the Early Head Start group). Over half of the deaths were miscarriages or stillbirths and we do not have complete data on age and cause of death for the remaining children. Three children were adopted after random assignment. No further data collection was attempted with families of deceased or adopted children.

Site coordinators reported that the data collection was very challenging. From the beginning of the project, some site coordinators reported that some families had not understood what they were signing up for (related to the program, the research activities, or both), and some site coordinators reported that control group families refused participation in the study after they learned that they were not going to receive Early Head Start services.

Analysis of the categories of nonresponse by site showed that the center-based sites were more successful in completing interviews and assessments with Early Head Start families than they were with the control group families. One explanation for this is that the Early Head Start families were using center-based services and may have been easier for research and program staff members to contact. To some degree, the same pattern might have been expected across all the programs—if the local research team used all available leads, they may have been able to contact and successfully complete interviews with a larger proportion of the Early Head Start group than the control group. This was not true across all sites, and in a number of sites research teams completed a larger proportion of the interviews with control group families.

In general, the PI response rate establishes the maximum for the Bayley, PPVT-III, TVIP, and parent-child videotaped assessment response rates. This is because if an interview was not done, it was generally the case that the other assessments also were not done. In some sites, IAs completed the PI by telephone if the interview window was about to close or if the family moved

away, rather than lose the entire data collection wave for the family. In those cases it was impossible to conduct the Bayley, PPVT-III, TVIP, and the parent-child videotaped assessments. Sites reported other data collection-related reasons for nonresponse on the Bayley, PPVT-III, TVIP, and the parent-child videotaped assessment, including child illness on the interview date, child refusal to participate in the Bayley or PPVT-III, TVIP, assessment or the videotaped assessments, parental refusal to participate in the videotaped assessments, and insufficient time during the visit to complete the assessments.

Some of the data that were collected could not be used because of technical problems or errors in administration of the assessment. Between 3 and 8 percent of the 1,854 24-month videotapes and between 2 and 3 percent of the 1,701 36-month videotapes sent to Columbia for coding could not be coded because of incorrect administration of the parent-child assessments, lack of video or sound, or other technical problems. Nine percent of the 1,950 24-month Bayley assessments and 7 percent of the 1,793 36-month assessments conducted could not be scored because of errors in administration of the test or the lack of a basal.

B.3 FATHER STUDY RESPONSE RATES

The father study data in this report are from interviews conducted with fathers or father figures of children in the program and control groups. As described above, the 12 father study sites recruited the men after the mothers identified them either as a resident biological, an involved nonresident biological, or a father figure. Here we report updated response rates using the complete sample of 24-month interviews as well as those for 36 months. Response rates at 24-months are slightly lower than were reported previously, because originally we reported only completed interviews that had been received from the sites. After the sites sent in the final cases, we were able to compute final response rates. Across the sites at 24 months, approximately 76 percent of interviewed mothers identified a father or father figure. Of those who were identified,

we were able to interview 727, or 62 percent of them. At the 36-month interview, we also asked mothers to identify a father or father figure and for permission to interview him. Across sites, 73 percent of interviewed mothers identified a father or father figure, of whom 698, or 64 percent were interviewed. Father study sample sizes and response rates at 24 and 36 months, by site are included in Table B.3.

Father Interview Response Bias. We examined baseline characteristics of families that had a father or father figure interviewed at either 24 or 36 months, and those that did not. We examined the following characteristics (unless noted, all were in reference to the mothers' characteristics at baseline): teenage mother, race/ethnicity, education, living arrangement, primary occupation, and child's sex. In most cases, *t*-tests of the proportions of fathers interviewed and not interviewed at each point showed significant differences in baseline characteristics between families with and without interviewed fathers. At 24 months, there were no differences in the proportions of families with a teen mother or with a male child, but there were differences in race, education, living arrangement, and primary occupation. The families with fathers or father figures interviewed at 24 months were generally more advantaged compared to families without an interviewed fathers. Families with interviewed fathers were composed of higher proportions of whites and lower proportions of African Americans, lower proportions with less than a high school education, higher proportions who lived with a spouse and correspondingly lower proportions living alone, and higher proportions in the "other" occupational category (unemployed or out of the labor force by choice). Findings at 36 months were similar, with the families who had interviewed fathers having an even larger proportion of whites and fewer African Americans, lower proportions with less than a high school education and a greater percentage with some college, higher proportions living with spouses, and significantly more who were employed or in the "other" occupational categories at baseline. In

TABLE B.3

FATHER INTERVIEW SAMPLE SIZES AND RESPONSE RATES FOR PROGRAM AND CONTROL GROUPS, BY SITE

	Father Interviews			
Site	24-Month Sample Size	Response Rate (Percentage)	36-Month Sample Size	Response Rate (Percentage)
1	51	45	44	37
3	54	45	30	25
4	63	57	52	46
6	36	24	55	40
8	83	55	96	66
10	47	51	44	52
11	30	25	37	27
13	102	69	101	69
14	48	44	44	44
15	71	54	53	43
16	74	50	82	59
17	68	46	60	44
Total	**727**	**62**	**698**	**64**

[a]The response rate was calculated by using the number of fathers identified by mothers during the 24- or 36-month parent interviews as the denominator.

addition, compared to their proportion at baseline, there were significantly fewer fathers interviewed at 36 months from families with a teenage mother at baseline. It is necessary to be mindful of the systematic ways that families with interviewed fathers differ from the overall sample of program and control families. Therefore, findings about the interviewed group may not generalize to the larger group of fathers and father figures in families in the entire sample, nor to the population of families eligible for Early Head Start.

We examined baseline characteristics of families with interviewed fathers at 24 and 36 months, to assess the similarity of the Early Head Start and the control groups. We compared proportions of teenage mothers, race/ethnicity, primary occupation, education, living arrangements, and child's gender between program and control families with interviewed fathers at each period. At 24 months, there were a few differences in baseline characteristics between program and control groups. Specifically, the program group had lower proportions of teenage mothers, whites, living arrangements with other adults, and higher proportions living alone compared to the control group. By 36 months, among families with an interviewed father or father figure, the only statistically significant difference was for living arrangements, with program families more likely to have mothers who lived alone at baseline rather than with a spouse or other adults compared to the control group.

APPENDIX C

OUTCOME MEASURES, PSYCHOMETRICS, AND IMPLEMENTATION MEASURES

This appendix provides supplementary information on measures used in the national evaluation for the impact and implementation analyses. We include:

- C.1 Selection of Child and Family Measures, p. C.5
- C.2 Constructs Used in the Analysis: Psychometric Properties, p. C.7
- C.3 Construction of Timelines, p. C.33
- C.4 Tables of Nonmissing Values for Constructs, p. C.35
- C.5 Implementation Measures, p. C.41

C.1 SELECTION OF CHILD AND FAMILY MEASURES

Our approach to selecting child and family measures was based on several guiding principles:

- **Relevance to Intervention Goals and Key Hypotheses.** The measures we chose were concentrated in areas that are important for children and families, that the Early Head Start program seeks to influence, and for which we had strong hypotheses about the short-term effects of the program.
- **Appropriateness to Children's Age and Developmental Level.** Because developmental change is rapid during the early years that are the focus of the evaluation, the measures of child outcomes appropriate at this age tend to focus on relatively narrow age ranges. Thus, to measure a particular outcome at different ages, we often had to select different outcome measures. In addition, a relatively large proportion of children from economically disadvantaged families exhibit developmental lags. Therefore, we considered the developmental level, as well as the chronological age of the children when choosing measures.
- **Appropriateness for the Early Head Start Population.** Many of the families in the sample have low income and represent racial, ethnic, and linguistic minority groups. Therefore, our goal was to choose measures available in languages other than English and normed or used with samples that include a variety of ethnic groups and children from economically disadvantaged families. In addition, we chose measures used with parents to be appropriate to their expected reading and comprehension levels as well as their cultural backgrounds.
- **Adequate Psychometric Properties.** We chose measures with adequate reliability and validity for children from low-income families and for a number of racial and ethnic groups. In general we chose measures with a demonstrated internal consistency reliability (coefficient alpha) of .70 or higher (this level is generally accepted as an adequate demonstration of reliability).
- **Prior Use in Large-Scale Surveys and Intervention Evaluations.** To reduce measurement development efforts and increase comparability with other national studies and intervention evaluations, many of the measures we chose were used in other studies and had demonstrated ease of administration and adequate psychometric properties. When we decided to use a measure that had not been used before, we worked with the author of the measure to determine whether we would expect it to work well in a national study with the characteristics of our study population.
- **Low Cost and Burden.** The measures we chose had to be administered reliably by trained interviewers rather than require administration by an experienced clinician. We also chose measures that posed minimal burden on the parents and children.

The national team (MPR and Columbia) worked with the Early Head Start Research Consortium to nominate measures, modify existing measures as needed, create new measures as needed, and pretest the interviews and assessments with families and children similar to the Early Head Start study families. The measures and the variables constructed from them are briefly described in each chapter of this report. Psychometric properties of the measures are described in Appendix C.2. The father study measures and their psychometric properties are also described in Appendix C.2.

C.2 CONSTRUCTS USED IN THE ANALYSIS: PSYCHOMETRIC PROPERTIES

To be included in the impact analyses, constructed variables had to meet the following criteria:

- **Sufficient Data at the Item Level.** If an individual was missing 25 percent or more of the items that went into a constructed variable, we did not construct the variable for that individual and that individual was not included in the impact analysis of that variable. If the individual was missing fewer than 25 percent of the items needed for a constructed variable, we imputed values based on the mean of the nonmissing items. The proportion of scores that required imputation was fairly low—if a parent began a measure, they generally completed all of the items. We never imputed values for our direct child assessments (the Bayley, MacArthur, PPVT-III, and the TVIP) or our parent-child videotaped assessments.
- **Adequate Distribution of Scores.** For our constructed variables, we checked the mean, standard deviation, skewness, and kurtosis to determine whether the variables had a normal distribution and seemed to have a similar distribution to those found in other studies using the same measure. In general, we found that our distributions met the criteria for normality, with skewness and kurtosis levels within appropriate ranges. The distributions were similar to those found in other studies of low-income families. Our sample means and standard deviations were generally lower than the means found in child assessment norming samples and in studies using similar measures with a more nationally representative sample of children and families.
- **Adequate Internal Consistency Reliability.** After discussion within the consortium and consultation with outside experts, we decided to include measures with internal consistency reliability of .65 and above in our impact analyses.
- **Consistent Reliability across Major Race/Ethnicity Subgroups.** We examined internal consistency reliability across our three major race/ethnicity groups, white non-Hispanics, black non-Hispanics, and Hispanics, to determine whether our measures had similar levels of reliability across these groups.

To prepare our data for analysis, we first consulted the literature and either scored questionnaires and child assessments as they had been scored by the author of the measure or we used a scoring approach consistent with the current literature. For new measures or for measures which required additional data reduction, we conducted factor analyses as needed. We also coded the parent-child videotaped assessments and analyzed the ratings. The factor analysis and coding procedures are described below.

a. Factor Analysis Approach

We used exploratory factor analysis techniques with Varimax rotation to create variables from multi-item questionnaire and observational measures. All factor analyses were conducted using only nonmissing child- and parent-level data. We used the following criteria to judge the adequacy of our factor analysis results:

- Items within factors made sense conceptually
- The solution yielded internal consistency reliability (coefficient alpha) of .65 or greater within each factor
- The solution minimized the number of items with appreciable loadings (.35 and greater) on multiple factors
- The solution minimized the number of items that did not load appreciably on any factor

b. Coding of the Parent-Child and Father-Child Videotaped Interactions at 24 and 36 months and Variable Creation

All videotapes of the 24- and 36-month parent-child videotaped interactions were coded by staff at the Center for Children and Families, Columbia University, Teachers College. At 24 months, a 10-minute semistructured free play task and a 3-minute teaching task were administered. At 36 months, the play task and a 6-minute puzzle challenge task were administered. These four tasks were also administered and coded for the 24- and 36-month waves of the father study. All codes were blind to the research status of the families.

Free Play Task: 24 and 36 Months. The semistructured free play task was coded according to scales adapted from the NICHD Study of Early Child Care's Three Box coding scales (NICHD Early Child Care Research Network 1997, 1999; Owen 1992; Owen et al. 1993). Nine 7-point coding scales assessed child and parent behavior. The three child scales rated *engagement of parent* (extent to which child initiates and/or maintains interaction with parent);

sustained attention with objects (degree of child's involvement with toys in the three bags); and *negativity toward parent* (degree to which child shows anger or hostility toward parent).

The six parenting scales addressed *sensitivity* (the extent to which the parent takes the child's perspective, accurately perceives the child's signals, and promptly and appropriately responds to these signals); *positive regard* (demonstration of love, respect, admiration); *stimulation of cognitive development* (teaching, actively trying to expand the child's abilities); *detachment* (under-involvement and lack of awareness, attention, engagement); *intrusiveness* (over-involvement, over-control); and *negative regard* (discontent, anger, rejection). Box C.2A includes more information about the individual coding scales.

A trained coding team leader worked with a five- to six-member coding team to establish and maintain inter-rater reliability throughout the coding period. For the coding of the 24- and 36-month semistructured play assessment, inter-rater reliabilities on the nine 7-point scales between the team leader and coders were established to a criterion of 85 percent (exact or within one point agreement). Thereafter, the team conducted weekly inter-rater reliability checks on a randomly selected 15 percent of each coder's videotape assignment. In the main study sample, a total of 151 tapes (9 percent of the 1,782 codable tapes) at 24 months and 174 tapes (11 percent of the 1,660 codable tapes) at 36 months served as reliability tapes. Percent agreement (exact or within one point) averaged 93 percent across all reliability checks for all 24-month coders, with a range of 84 to 100 percent. Percent agreement averaged 94 percent for all 36-month coders, with a range of 86 to 100 percent. In the father study sample, 43 tapes (14 percent of the 318 codable tapes) at 24 months and 44 tapes (15 percent of the 303 codable tapes) at 36 months served as reliability tapes. Percent agreement (exact or within one point) averaged 94 percent for all 24-month coders, with a range of 85 to 100 percent. Percent agreement averaged 94 percent for all 36-month coders, with a range of 86 to 100 percent.

BOX C.2A

24- AND 36-MONTH CODING SCALES FOR THE PARENT-CHILD AND FATHER-CHILD SEMISTRUCTURED PLAY ASSESSMENTS

Child Scales

Engagement of Parent Reflects the extent to which the child shows, initiates, and/or maintains interaction with the parent. This may be expressed by approaching or orienting toward parent, establishing eye contact with parent, positively responding to parent's initiations, positive affect directed to parent, and/or engaging parent in play.

Sustained Attention Measures the degree to which the child is involved with the toys presented in the three bags. Indicators include the degree to which child "focuses in" when playing with an object and the extent to which child coordinates activities with several objects and/or explores different aspects of a toy.

Negativity toward Parent Reflects the degree to which child shows anger, hostility, or dislike toward parent. Expressions may be overt (for example, forcefully rejecting a toy offered by parent or pushing parent away) or covert (for example, hitting or throwing an object in response to parent's behavior).

Parent Scales

Sensitivity Measures the degree to which the parent observes and responds to the child's cues (gestures, expressions, and signals) during times of distress as well as non-distress. Key features include being child-centered, "tuning in" to the child, manifesting an awareness of child's needs, moods, interests, and capabilities, being flexible in supporting and responding to child's emerging need for autonomy, control, independence, and mastery even while enforcing necessary rules, regulations, and constraints.

Positive Regard Assesses the parent's expression of love, respect and/or admiration for the child. Key features include verbal praising of child's efforts and successes, words of encouragement or support, and nonverbal affect, the way in which parent watches child attentively and looks into the child's face.

Stimulation of Cognitive Development Measures the quality and quantity of the parent's effortful teaching to enhance child's perceptual, cognitive, and linguistic development. Key features include being aware of the child's developmental level, efforts to bring the child above that level, flexibility and timing of instructions or explanations, and use of complex and varied language.

Detachment Measures the parent's lack of awareness, attention, and engagement with the child. Key features include being inattentive, perfunctory, or cold when interacting with child or, at the higher levels, complete lack of attention to or interaction with child.

Intrusiveness Assesses the degree to which the parent exerts control over the child rather than acting in a way that recognizes and respects the validity of the child's perspective. Intrusive interactions are clearly adult-centered rather than the child-centered and involve imposing the parent's agenda on the child despite signals that a different activity, level or pace of interaction is needed.

Negative Regard Reflects the parent's expression of discontent with, anger toward, disapproval of, and/or rejection of the child. This may be expressed verbally (words of derogation or disregard toward child) or physically (parental roughness, grabbing, or hitting child).

NOTE: Scales are assessed on a seven-point scale, "1" indicating a very low incidence of the behavior and "7" indicating a very high incidence of the behavior. The 24- and 36-month scales were adapted by Christy Brady-Smith, Rebecca Fauth, Claudia O'Brien, Lisa Berlin, and Anne M. Ware and were based on the "Early Head Start 14-month Child-Parent Interaction Rating Scales for the Three Bag Assessment" (Ware, Brady, O'Brien, and Berlin 1998), the NICHD Study of Early Child Care 15-, 24-, and 36-month ratings of Parent-Child Interaction, and the "Manual for Coding Freeplay - Parenting Styles from the Newark Observational Study of the Teenage Parent Demonstration" (Brooks-Gunn et al. 1992).

We conducted preliminary analyses examining correlations among these scales, possible underlying factors, and internal consistency. Based on our analyses, we created a main study composite parenting score, "supportiveness" (coefficient alpha = .83 and .82 at 24 and 36 months, respectively), by computing the mean scores for parental sensitivity, cognitive stimulation, and positive regard, which were highly and significantly correlated (correlations ranged from .52 to .67 at 24 months and from .50 to .71 at 36 months).

The scales assessing parental insensitivity (detachment, intrusiveness, and negative regard) and the child scales (engagement of parent, sustained attention with objects, and negativity toward parent) were retained as individual scales. In the main study, the correlations among the three child scales were moderate to high (statistically significant correlations of .34 to .55 at 24 months and .27 to .63 at 36 months). The correlations among the four parenting scales were small to moderate and statistically significant (correlations of .11 to .40 at 24 months and .12 to .36 at 36 months), with the exception of supportiveness and detachment (correlation of -.56 and -.45, respectively) and intrusiveness and negative regard (correlation of .52 and .47, respectively).

We created the same supportiveness composite for the father study. In the father study, correlations indicated a strong relationship between the variables that make up the composite score of supportiveness (correlations ranged from .55 to .64 at 24 months and from .60 to .73 at 36 months). The internal consistency of supportiveness was .86 at both time points. The same scales used in the main study were retained in the father study. Correlations among the three child scales were moderate to high (statistically significant correlations of .26 to .58 at 24 months and .30 to .61 at 36 months), with the exception of sustained attention and negativity toward parent at 36 months (correlation of .14). The correlations among the four parenting scales were moderate (correlations of .31 to .49 at 24 months and .20 to .42 at 36 months), with the exception

of negative regard and detachment, which were small (nonsignificant correlations of .17 and .06, respectively), and intrusiveness and detachment, which were not significant (correlation of .07 in both waves).

Teaching Task: 24 Months. The Teaching Task was administered and videotaped in the home at 24 months. This procedure was a modified version of the Nursing Child Assessment Teaching Scales (NCATS), in which the parent instructs the child in an unfamiliar play activity. The parent was asked to select, from two choices, a task that the child either could not do or that would be the harder task for the child. The tasks were either sorting blocks, or reading a picture book. Parents were instructed to explain the task to the child and give the child any necessary assistance. The total interaction lasted three minutes.

For the coding of the 24-month teaching task mother-child interactions, five coders were trained by a certified NCATS instructor during a three-day training course. Each coder was required to pass the NCATS certification in the weeks following the initial training. In addition, inter-rater reliabilities between a certified coding team leader and the NCATS-certified coding team were then established to a criterion of 85 percent (exact agreement) on the individual items from the 6 NCATS subscales. Thereafter, intermittent inter-rater reliability checks on a randomly selected 15 percent of each coder's videotape assignment were conducted. A total of 130 tapes (8 percent of the 1,687 codable tapes) served as reliability tapes. Percent agreement on NCATS subscales averaged 89 percent with a range from 84 to 95. Two of these certified coders also coded the videotapes of the father-child teaching interaction. Initial reliability on coding father-child interactions was achieved on 37 videotapes (12 percent of the 312 codable), with intermittent ongoing reliability checks as described above for the main study tapes. Percent agreement on NCATS subscales for father study tapes ranged from 89 percent to 97 percent (average of 93 percent).

Coding consisted of dichotomous (yes/no) ratings on each of 73 behaviors, including 50 parent behaviors and 23 child behaviors. The published coding system (Sumner and Spietz, 1994) groups these behaviors into six subscales. The four parent subscales include *sensitivity to cues* (caregiver's sensitive responses to child's cues), *response to child's distress* (caregiver's change of the task and/or comforting responses to a child exhibiting disengagement or distress), *social-emotional growth fostering* (positive affect and avoidance of negative responses to the child), and *cognitive growth fostering* (caregiver's instruction and modeling of the task). Child behaviors were coded in two subscales: *clarity of cues* (facial expressions and motor activity indicating child's response to the task situation), and *responsiveness to caregiver* (child's facial expressions, vocalizations, and other responses to caregiver).

Preliminary analyses of the internal consistency of these scales revealed that very few of the subscales had internal consistency that met the Early Head Start criterion for use as outcome variables in the analyses of program impacts (coefficient of alpha = .65 or greater). Alpha for the parent subscales ranged from .24 to .74. Extensive consultation with Kathryn Barnard of the University of Washington (and developer of the NCATS scales) explored several potential explanations for the pattern of alphas found in the Early Head Start sample, including the very detailed coding afforded by the use of videotapes (rather than live coding), a shorter time allotted for the teaching interaction in the Early Head Start administration, and a truncated choice of tasks used in the Early Head Start protocol. These discussions, along with extensive psychometric analysis of the data and recommendations from Kathryn Barnard, led us to focus impact analyses exclusively on the total score (including all 73 coded items; coefficient alpha = .66 for mother tapes; alpha = .68 for father tapes) and the parenting items, added together into a parent total score (coefficient alpha = .66 for mothers; .64 for fathers).

Puzzle Challenge Task: 36 Months. The puzzle task was administered and videotaped in the home at 36 months and is based on the work of Matas, Sroufe, and colleagues (Matas, Arend, & Sroufe, 1978; Sroufe, Egeland, & Kreutzer, 1990). The child is asked to solve up to three puzzles of increasing difficulty in 6 to 7 minutes. The parent is instructed to let the child work on the puzzles independently first and then give the child any help he or she may need. If the dyad takes more than four minutes to solve a puzzle, the assessor/interviewer asks them to move on to the next puzzle.

Seven 7-point scales were adapted from the Newark Observational Study of the Teenage Parent Demonstration (TPD; Brooks-Gunn, Liaw, Michael, & Zamsky, 1992; Spiker, Ferguson, & Brooks-Gunn, 1993) to assess child and parent behaviors during the puzzle task. In developing the Early Head Start scales, the TPD scales were condensed and examples were tailored to the Early Head Start puzzle task assessment. The three child scales rated *engagement of parent* (extent to which child initiates and/or maintains interaction with parent); *persistence* (degree to which child is goal-oriented, focused and motivated to complete the puzzles); and *frustration with task* (degree to which child shows anger or frustration with the puzzle task).

The four parenting scales rated *supportive presence* (the degree to which the parent provides emotional, physical, and affective support to the child during the task); *quality of assistance* (the quality of instrumental support and assistance the provided to the child); *intrusiveness* (over-involvement, over-control); and *detachment* (under-involvement and lack of awareness, attention, engagement). Box C.2B includes more information about the individual coding scales.

To train coders, a training videotape was developed containing exemplars of high, medium and low scoring interactions along each scale. Coders reached 85 percent agreement or higher with a “gold standard” before coding unique interactions. A randomly selected 15 to 20 percent of each coder’s weekly tape assignments were used to check coders’ ongoing reliability. In the

main study sample, a total of 194 tapes (12 percent of the 1,639 codable tapes) served as reliability tapes. Percent agreement (exact or within one point) averaged 93 percent across for all 36-month puzzle task coders, with a range of 88 to 100 percent. In the father study sample, 55 tapes (18 percent of the 300 codable tapes) served as reliability tapes. Percent agreement (exact or within one point) averaged 97 percent for all coders, with a range of 90 to 100 percent.

In the main study, the correlation among child engagement and frustration with the task was not significant (correlation of -.05); correlations among the other child scales were moderate to high (statistically significant correlations of -.21 and .41). The correlations among the four parenting scales were moderate to high and statistically significant (correlations of -.27 to .59), with the exception of the correlation between intrusiveness and detachment, which was small but significant (correlation = .16).

In the father study, the correlation among child engagement and frustration with the task was small, but significant (correlation = -.13); correlations among the other child scales were moderate to high (statistically significant correlations of -.21 and .31). The correlations among the four parenting scales were moderate to high and statistically significant (correlations of .24 to .52).

BOX C.2B

36-MONTH CODING SCALES FOR THE PARENT-CHILD AND FATHER-CHILD PUZZLE CHALLENGE ASSESSMENTS

Child Scales

Engagement of Parent Reflects the extent to which the child shows, initiates, and/or maintains interaction with the parent and communicates positive regard and/or positive affect to the parent.

Persistence Measures how goal-oriented, focused and motivated the child remains toward the puzzle throughout the task, even in the face of frustration or boredom. The focus of persistence is on the child's apparent effort to solve the puzzle, not on how well the child performs.

Frustration with Task Measures the degree to which the child expresses frustration or anger toward the puzzle task. Expressions may be intense (for example, throwing the puzzle to the side or refusing to continue working on the puzzle) or subtle (for example, sighing, frowning, pushing a puzzle piece that will not fit).

Parent Scales

Supportive Presence Focuses on the parent's emotional availability and physical and affective presence during the puzzle task. Supportive presence involves providing a secure base from which the child can explore, and displaying emotional support and enthusiasm toward the child and his or her autonomous work.

Quality of Assistance Measures the instrumental support and assistance the parent offers the child during the puzzle task. Specifically, quality of assistance is the extent to which the parent helps the child by scaffolding the task to bring the child above his/her level of understanding and ability, and helping the child to think analytically. Key features include illustrating general cause and effect relationships within the puzzle and its related parts, and stimulating the child's perceptual, cognitive, and linguistic development, so that the child might be better able to solve a similar problem autonomously.

Intrusiveness Assesses the degree to which the parent controls the child rather than recognizing and respecting the validity of the child's independent efforts to solve the puzzle. Intrusive interactions are clearly adult-centered rather than child-centered and undermine the child's potential for understanding and solving the puzzles independently.

Detachment Measures the parent's lack of awareness, attention, and engagement with the child. Key features include being inattentive, perfunctory, or cold when interacting with child or, at the higher levels, complete lack of attention to or interaction with child.

NOTE: Scales are assessed on a seven-point scale, "1" indicating a very low incidence of the behavior and "7" indicating a very high incidence of the behavior. The 36-month puzzle task scales were adapted by Christy Brady-Smith, Rebecca M. Ryan, Lisa J. Berlin, Jeanne Brooks-Gunn, and Allison Sidle Fuligni. They are based on the "Manual for Coding the Puzzle Task" from the Newark Observational Study of the Teenage Parent Demonstration (TPD; Brooks-Gunn, Liaw, Michael, & Zamsky, 1992; Spiker, Ferguson, & Brooks-Gunn, 1993).

c. Psychometric Information for Key Constructed Variables

Table C.2A presents key psychometric data for the main study constructed variables created for the interim report and updated here. Table C.2B presents key psychometric data for the main study constructed variables included in this report. The tables are organized by measurement domain. We include the sample size, possible range of values for each variable, the actual range found in the Early Head Start sample, the sample mean, standard deviation, and the internal consistency reliability (coefficient alpha). The psychometric data are presented for the full sample, that is, with the program and control group combined.

TABLE C.2A

DESCRIPTIVE INFORMATION FOR COMPOSITE VARIABLES CONSTRUCTED FROM 24-MONTH PARENT INTERVIEWS AND CHILD ASSESSMENTS, FOR THE FULL SAMPLE

Measure	Sample Size	Possible Range		Range		Mean	Standard Deviation	Internal Consistency Reliability[a]
		Minimum	Maximum	Minimum	Maximum			
Child Cognitive and Language Development								
Bayley Mental Development Index (MDI) Standard Score	1,781	49	150	49	134	89.1	13.7	NA
MacArthur Communicative Development Inventories (CDI) Vocabulary Production Score	2,070	0	100	0	100	54.8	23.0	0.98
MacArthur CDI Sentence Complexity Score	1,986	0	37	0	37	8.2	8.3	0.95
Child Social-Emotional Development								
Engagement During Parent-Child Semistructured Play	1,796	1	7	1	7	4.3	1.1	NA
Sustained Attention with Objects During Parent-Child Semistructured Play	1,796	1	7	1	7	5.0	1.0	NA
Negativity Toward Parent During Parent-Child Semistructured Play	1,796	1	7	1	7	1.7	1.0	NA
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	1,916	1	5	1	5	3.6	0.8	0.92
Bayley BRS: Orientation/Engagement	1,911	1	5	1	5	3.6	0.8	0.83
Child Behavior Checklist: Aggressive Behavior	2,103	0	30	0	30	10.1	5.6	0.91
Quality of the Home Environment and Parenting								
Home Observation for Measurement of the Environment (HOME) Total Score	1,951	0	31	8.3	31	26.4	3.5	0.76
Parenting Behavior: Emotional Support								
HOME Emotional Responsivity	1,949	0	7	0	7	6.1	1.4	0.74
Supportiveness During Parent-Child Semistructured Play	1,709	1	7	1	7	4.0	1.1	0.83

TABLE C.2A *(continued)*

Measure	Sample Size	Possible Range Minimum	Possible Range Maximum	Range Minimum	Range Maximum	Mean	Standard Deviation	Internal Consistency Reliability[a]
Parenting Behavior: Stimulation of Language and Learning								
HOME Support of Cognitive, Language, and Literacy Environment	2,148	0	12	0	12	10.2	1.7	0.68
Parent-Child Play	2,124	1	6	1	6	4.5	0.8	0.78
HOME Maternal Verbal-Social Skills	1,998	0	3	0	3	2.8	0.6	0.71
Parental Modernity Progressive	2,131	5	25	5	25	20.9	3.4	0.68
Parental Modernity Traditional	2,129	5	25	5	25	18.7	4.2	0.73
Parent-Child Outside Activities	2,124	1	6	1	6	2.8	0.7	0.71
Parenting Behavior: Negative Parenting Behavior								
Detachment During Parent-Child Semistructured Play	1,794	1	7	1	7	1.4	0.9	NA
Intrusiveness During Parent-Child Semistructured Play	1,796	1	7	1	7	1.9	1.0	NA
Negative Regard During Parent-Child Semistructured Play	1,796	1	7	1	7	1.4	0.8	NA
HOME Absence of Punitive Interactions	1,947	0	5	0	5	4.4	1.2	0.78
Knowledge of Child Development and Discipline Strategies								
Knowledge of Infant Development Inventory (KIDI)	2,141	1	4	1.8	4.0	3.4	0.4	0.56[b]
Percentage of Parents Who Would Use Mild Discipline Only	2,156	0	1	0	1	0.4	0.5	NA
Index of Severity of Discipline Strategies	2,156	1	5	1	5	2.7	1.7	NA
Self-Sufficiency								
Family Resource Scale	2,223	39	195	68.3	195	152.9	19.4	0.91
Parent Mental Health and Family Functioning								
Parenting Stress Index (PSI) Parent-Child Dysfunctional Interaction	2,130	12	60	12	56.7	17.2	5.9	0.78
PSI Parental Distress	2,131	12	60	12	60	25.4	9.3	0.82
Family Environment Scale (FES) Family Conflict	1,856	1	4	1	4	1.71	0.54	0.67
Composite International Diagnostic Interview (CIDI) – Short Form: Major Depression (probability)[c] (lower bound)	2,156	0	90.8	0	90.8	12.5	29.8	NA

TABLE C.2A *(continued)*

Source: Parent interviews, child assessments, interviewer observations, and assessments of parent-child semistructured play assessments conducted when children were approximately 24 months old, and Parent Services Interviews conducted approximately 15 months after enrollment.

[a]Reliability was estimated using Cronbach's coefficient alpha formula.

[b]The KIDI items we used were a subset of the 20 used by the IHDP study. Although the resulting summary score did not meet our .65 internal consistency reliability criterion, we included the score in the impact analysis because parent knowledge was a key outcome for many of the programs and these items have been used successfully in other studies with other samples. It is likely that our reduction of the number of items resulted in the reduced reliability.

[c]A skip logic error in the version of the CIDI that we used prevented us from scoring the CIDI in the usual way. Based on the advice of the CIDI developer, we created 2 versions of the CIDI scores-a lower and upper bound (the true CIDI score is between these two scores). The lower and upper bound scores tend to be 1 to 4 percentage points apart for the full sample and most subgroups. The impact estimates and their significance using both versions are very similar. In the report, we use the lower bound version of the measure (the most conservative estimate of the probability of depression).

TABLE C.2B

DESCRIPTIVE INFORMATION FOR COMPOSITE VARIABLES CONSTRUCTED FROM 36-MONTH PARENT INTERVIEWS AND CHILD ASSESSMENTS, FOR THE FULL SAMPLE

Measure	Sample Size	Possible Range		Range		Mean	Standard Deviation	Internal Consistency Reliability[a]
		Minimum	Maximum	Minimum	Maximum			
Child Cognitive and Language Development								
Bayley Mental Development Index (MDI) Standard Score	1,658	49	150	49	134	90.6	12.6	NA
Peabody Picture Vocabulary Test (PPVT-III) Standard Score	1,424	40	160	41	125	83.0	15.6	NA
Teste de Vocabulario en Images Peabody (TVIP) Standard Score	228	78	145	78	131	95.3	8.2	NA
Child Social-Emotional Development								
Engagement During Parent-Child Semistructured Play	1,659	1	7	1	7	4.7	1.0	NA
Sustained Attention with Objects During Parent-Child Semistructured Play	1,656	1	7	2	7	4.9	1.0	NA
Engagement During Parent-Child Puzzle Challenge Task	1,645	1	7	1	7	5.0	0.9	NA
Persistence During Parent-Child Puzzle Challenge Task	1,634	1	7	1	7	4.5	1.2	NA
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	1,759	1	5	1	5	3.9	0.8	0.90
Bayley BRS: Orientation/Engagement	1,768	1	5	1	5	3.8	0.7	0.80
Negativity Toward Parent During Parent-Child Semistructured Play	1,659	1	7	1	7	1.3	0.6	NA
Frustration with Parent-Child Puzzle Challenge Task	1,642	1	7	1	7	2.7	1.3	NA
Child Behavior Checklist: Aggressive Behavior	2,031	0	38	0	37	11.1	6.5	0.88
Quality of the Home Environment and Parenting: Overall and Physical Environment								
Home Observation for Measurement of the Environment (HOME) Total Score	1,807	0	37	10	37	27.2	4.8	0.80
HOME Internal Physical Environment	1,777	3	9	3	9	7.8	1.5	0.77

TABLE C.2B *(continued)*

Measure	Sample Size	Possible Range Minimum	Possible Range Maximum	Range Minimum	Range Maximum	Mean	Standard Deviation	Internal Consistency Reliability[a]
Parenting Behavior: Emotional Support								
HOME Warmth	1,794	0	3	0	3	0.3	0.6	0.72
Supportiveness During Parent-Child Semistructured Play	1,658	1	7	1	6.3	3.9	0.9	NA
Supportive Presence During Parent-Child Puzzle Challenge Task	1,647	1	7	1	7	4.5	1.3	NA
Parenting Behavior: Stimulation of Language and Learning								
HOME Support of Language and Learning	1,861	0	13	1	13	10.5	2.0	0.67
Parent-Child Play	2,076	1	6	1	6	4.4	0.9	0.80
Quality of Assistance During Parent-Child Puzzle Challenge Task	1,646	1	7	1	7	3.5	1.2	NA
Parenting Behavior: Negative Parenting Behavior								
Detachment During Parent-Child Semistructured Play	1,659	1	7	1	6	1.2	0.6	NA
Intrusiveness During Parent-Child Semistructured Play	1,659	1	7	1	6	1.6	0.8	NA
Detachment During Parent-Child Puzzle Challenge Task	1,646	1	7	1	7	1.6	0.9	NA
Intrusiveness During Parent-Child Puzzle Challenge Task	1,646	1	7	1	7	2.7	1.3	NA
Negative Regard During Parent-Child Semistructured Play	1,658	1	7	1	6	1.3	0.6	NA
HOME Harshness	1,801	0	3	0	3	0.3	0.6	0.55
Discipline Strategies								
Percentage of Parents Who Would Use Mild Discipline Only	2,105	0	1	0	1	0.4	0.5	NA
Index of Severity of Discipline Strategies	2,105	1	5	1	5	3.4	1.6	NA
Self-Sufficiency								
Family Resource Scale	2,073	39	195	79	195	154.0	18.9	0.92
Parent Mental Health								
Parenting Stress Index (PSI) Parental Distress	1,634	12	60	12	60	25.2	9.6	0.84
PSI Parent-Child Dysfunctional Interaction	1,607	12	60	12	56.7	17.8	6.4	0.81

TABLE C.2B *(continued)*

Measure	Sample Size	Possible Range Minimum	Possible Range Maximum	Range Minimum	Range Maximum	Mean	Standard Deviation	Internal Consistency Reliability[a]
Family Environment Scale (FES) Family Conflict	1,442	1	4	1	4	1.7	0.5	0.68
Center for Epidemiological Studies Depression (CES-D; Short Form)	2,095	0	36	0	36	7.7	7.0	0.88
Family Environment Scale (FES) Family Conflict	1,442	1	4	1	4	1.7	0.5	0.68

Source: Parent interviews, child assessments, interviewer observations, and assessments of parent-child semistructured play assessments conducted when children were approximately 36 months old, and Parent Services Interviews conducted approximately 15 months after enrollment.

[a]Reliability was estimated using Cronbach's coefficient alpha formula.

d. Father Study Measures and Constructed Variable Psychometrics

Data about fathers in this report are from three main sources: (1) parent interviews conducted in all 17 research sites when the children were approximately 14, 24, and 36 months old, (2) father interviews conducted in the 12 father study sites when the children were approximately 24 and 36 months old, and (3) father-child videotaped interactions conducted in 7 of the father study site when the children were approximately 24 and 36 months old. In this section we describe the main measures derived from each data source for this report and also present their psychometric properties.

Based on the parent interviews (usually conducted with the child's mother), we constructed variables that summarize whether the child's biological father was present in the child's life, whether a male (the biological father or a father figure--in the case that the biological father did not live with the child) was present in the child's life, and whether the mother was married to the child's biological father or if he was either married to her, lived with her, or was her boyfriend. We defined father presence as: (1) the child and the biological father live together, (2) the child and the biological father do not live together but he sees the child a few times per month or more, (3) the child and the biological father do not live together and do not see each other a few times or month or more, but the mother reports that there is a man in the child's life who is, "like a father" to the child. We created these variables at discreet points in time and also used them to create longitudinal variables that described father presence and marital status in relation to the mother.

At 24 and 36 months, we collected data directly from fathers and father figures identified by mothers as being involved in the lives of their children in the 12 father study sites. The father study response rates by site are reported in Appendix B. We designed the father study interviews to include a large degree of overlap with the parent interviews to allow us to compare mother and

father responses. To measure father activities related to program services, we adapted questions from the parent services interviews and included them in the father interview. We also were interested in unique aspects of fathering and father-child interaction and included measures that would tap those constructs as well. The father-child videotaped interactions were identical to the parent-child interactions and were coded in the same way as described above.

In Box IV.1, we reported on five father program-related activities and the frequency with which fathers reported that they participated in those activities. In Box V.10 (Chapter V in Volume I), we described mother reports of father presence and marriage as described above. The rest of the Box V.10 father measures are described in Box C.2C. Their psychometric properties are described in Table C.2C.

BOX C.2C

FATHER STUDY MEASURES

Father Activities with Child – measures the frequency with which the father or father figure reported engaging in different activities with the child over the past month. These included social activities; activities that can stimulate language development, such as reading or telling stories, dancing, singing, and playing outside together; caregiving activities such as putting the child to bed getting up at night with the child, and preparing meals. Item responses are coded on a six-point scale, with zero indicating "not at all", and five indicating "more than once a day."

Eliminating 8 items that had low variability, we factor analyzed 25 father-child activity items using a Varimax rotation to develop four factor scores. We selected a factor solution that conformed to the following criteria: (1) factors made conceptual sense, (2) yielded an internal consistency reliability (Coefficient alpha) of .65 or greater, (3) minimized the number of items that loaded appreciably (.35 or greater) on multiple factors, and (4) minimized the number of items that did not load appreciably on any factors. To make it possible to compare responses across the four different scores, we standardized raw factor scores by converting them to *T*-scores. *T*-Scores have a mean of 50 and a standard deviation of 10.

Frequency of Caregiving Activities Score – measures the frequency the father or father figure reports engaging in eight different caregiving activities, such as helping with tooth brushing or bathing the child. *T*-Scores ranged from 1 to 70.

Frequency of Social Activities Score – measures the frequency with which fathers and father figures reported engaging in five activities that had a social or external component, such as taking the child to visit relatives or going to a restaurant. *T*-Scores ranged from 1 to 73.

Frequency of Cognitive Activities Score – measures the frequency with which fathers and father figures reported engaging in five activities that had a cognitive development component, such as singing nursery rhymes, reading stories, or telling stories. *T*-Scores ranged from 1 to 73.

Frequency of Physical Play Score – measures the frequency with which fathers or father figures reported engaging in six activities that connoted play, ranging from calm activities such as rolling a ball or bouncing on the knee, to rough and tumble, such as playing chasing games or turning the child upside down. *T*-Scores ranged from 1 to 73.

Father Well-Being –

Parenting Stress Index – Short Form (PSI-SF) – measures the degree of stress in parent-child relationships stemming from three possible sources: the child's challenging temperament, parental depression, and negatively reinforcing parent-child interactions (Abidin 1995). We included two subscales of the PSI-SF:

Parental Distress – measures the level of distress the parent is feeling in his or her role as a parent stemming from personal factors, including a low sense of competence as a parent, stress because of perceived restrictions stemming from parenting, depression, and lack of social support.

The parent answers whether he or she agrees or disagrees with statements such as, "You often have the feeling that you cannot handle things very well," and "You feel trapped by your responsibilities as a parent," and "You feel alone and without friends." Item responses are coded on a 5-point scale, with 5 indicating high levels of parental distress. Scores on the 12-item subscale can range from 12 to 60.

Parent-Child Dysfunctional Interaction – measures the father's perception that the child does not meet the father's expectations and interactions with the child are not reinforcing the father. The father

may perceive that the child is abusing or rejecting the father or that the father feels disappointed in or alienated from the child.

The father answers whether he agrees or disagrees with statements such as, "Your child rarely does things for you that make you feel good," and "Most times you feel that your child does not like you and does not want to be close to you," and "Your child seems to smile less than most children." Item responses are coded on a 5-point scale, with 5 indicating high levels of parent-child dysfunctional interaction. Scores on the 12-item subscale can range from 12 to 60.

Center for Epidemiological Studies Depression Scale – Short Form (CESD-SF) – measures symptoms of depression (Ross et al. 1983). It does not indicate a diagnosis of clinical depression, but it does discriminate between depressed patients and others. The scale includes 12 items taken from the full, 20-item CESD scale (Radloff 1977). Respondents were asked the number of days in the past week they had a particular symptom. Symptoms include poor appetite, restless sleep, loneliness, sadness, and lack of energy. Items coded on a four-point scale from rarely (0) to most days (3). Scores on the scale range from 0 to 36.

Severe Depressive Symptoms – percentage of fathers whose scores on the CESD-SF were 15 or higher. This corresponds to a score of 25 or higher on the full CES-D, which is used to indicate high levels of depressive symptoms (Seligman 1993).

Family Environment Scale – measures the social environments of families along 10 key dimensions, including family relationships (cohesion, expressiveness, and conflict); emphases within the family on aspects of personal development that can be supported by families (for example, achievement orientation; independence); and maintenance of the family system (organization and control) (Moos and Moos 1976). We measured one dimension:

Family Conflict – measures the extent to which the open expression of anger and aggression and generally conflictual interactions are characteristic of the family. Parents respond to items on a 4-point scale, where 4 indicates higher levels of agreement with statements such as, "We fight a lot," and "We hardly ever lose our tempers." Items were recoded and averaged so that 4 indicates high levels of conflict.

Discipline Strategies – measures the father's strategies for handling four different potential conflict situations with the child: (1) the child keeps playing with breakable things; (2) the child refuses to eat; (3) the child throws a temper tantrum in a public place; and (4) the child hits the parent in anger. Fathers provided open-ended answers to how they would respond to each of the four situations, and these responses were classified into the types of discipline strategies, which were coded as binary variables. A father received a "1" for each strategy that was ever mentioned. In addition, we created the following composite measure:

Index of Severity of Discipline Strategies – measures the degree of harshness of discipline strategies suggested. An individual's score on this index ranges from 1 to 5, and is determined by the harshest strategy that was suggested in response to any of the three conflict situations. Thus, fathers who said they would use physical punishment receive a 5; those who did not suggest physical punishment but did say they would shout at the child receive a 4; those whose harshest response was to threaten the child with punishment receive a 3; those who suggest sending the child to his or her room, ignoring the behavior, threatening time out or loss of treats, or saying "No!" receive a 2; and those who suggested only preventing the situation or distracting the child, removing the child or object, talking to the child, or putting the child in time out receive a 1.

Spanked Child in Previous Week – measures father's report that he used physical punishment in the previous week by spanking the child.

Parenting Behavior –

During Father-Child Semistructured Play – measures the father's behavior with the child during a semistructured play task. The father and child were given three bags of interesting toys and asked to play

with the toys in sequence. The semistructured play task was videotaped, and child and parent behaviors were coded by child development researchers according to strict protocols. This assessment was adapted for this evaluation from the Three Box coding scales used in the NICHD Study of Early Child Care (NICHD Early Child Care Research Network 1999). Coded dimensions of parenting behavior included:

Supportiveness – this composite measure is an average of father sensitivity, cognitive stimulation, and positive regard during play with the child. *Sensitivity* includes such behavior as acknowledgement of the child's affect, vocalizations, and activity; facilitating the child's play; changing the pace of play when the child seems under-stimulated or over-excited; and demonstrating developmentally appropriate expectations of behavior. *Cognitive stimulation* involves taking advantage of the activities and toys to facilitate learning, development, and achievement; for example, by encouraging the child to talk about the materials, by encouraging play in ways that illustrate or teach concepts such as colors or sizes, and by using language to label the child's experiences or actions, to ask questions about the toys, to present activities in an organized series of steps, and to elaborate on the pictures in books or unique attributes of objects. *Positive regard* includes praising the child, smiling or laughing with the child, expressing affection, showing empathy for the child's distress, and showing clear enjoyment of the child.

Intrusiveness – measures the extent to which the father exerts control over the child rather than acting in a way that recognizes and respects the validity of the child's perspective. Higher scores on intrusiveness indicate that the father controlled the play agenda, not allowing the child to influence the focus or pace of play, grabbing toys away from the child, and not taking turns in play with the child.

During Father-Child Puzzle Challenge Task – measures the father's behavior with the child during a puzzle completion task. The child was given a puzzle to play with, and the father was instructed to give the child any help needed. After 3 minutes, or earlier if the puzzle was completed, the interviewer gave the child a second, harder puzzle and asked the father not to help the child. If that puzzle was completed or 3 minutes elapsed, another, more challenging puzzle was provided. The puzzle challenge task was videotaped, and child and father behaviors were coded on a 7-point scale by child development researchers according to strict protocols. Four aspects of the father's behavior with the child were rated on a 7-point scale:

Quality of Assistance – measures the frequency and quality of clear guidance to the child, flexible strategies for providing assistance, and diverse, descriptive verbal instructions and exchanges with the child.

Intrusiveness – measures the degree to which the father controls the child rather than recognizing and respecting the validity of the child's independent efforts to solve the puzzle. For example, a father behaving intrusively may complete the puzzle for the child or offer rapid, frequent instructions.

Child Behavior with Father -

Child Behavior Checklist – Aggressive Behavior – this subscale measures the incidence of 19 child behavior problems that tend to occur together and constitute aggressive behavior problems. Parents completed the Aggressive subscale of the Child Behavior Checklist for Ages 1 ½ to 5 Years (Achenbach and Rescorla 2000). Some behaviors asked about include, "Child has temper tantrums," "Child hits others," and "Child is easily frustrated." For each of the possible behavior problems, the father was asked whether the child exhibits this behavior often, sometimes, or never. Scores range from 0, if all of the behavior problems are "never" observed by the parent, to 38, if all of the behavior problems are "often" observed.

During Father-Child Semistructured Play – measures the child's behavior with the father during the semistructured play task.

Engagement – measures the extent to which the child shows, initiates, or maintains interaction with the father. This may be expressed by approaching or orienting toward the father, establishing eye

contact with the father, positively responding to the fathers' initiations, positive affect directed toward the father and/or engaging the parent in play. Very high engagement receives a 7.

Sustained Attention with Objects – measures the degree to which the child is involved with the toys presented in the three bags. Indicators include degree to which the child "focuses in" when playing with an object and the extent to which the child coordinates activities with several objects and/or explores different aspects of a toy. Very high sustained attention receives a 7.

Negativity Toward Father – measures the degree to which the child shows anger, hostility, or dislike toward the father. Expressions may be overt (for example, forcefully rejecting a toy offered by the parent or pushing the parent away) or covert (for example, hitting or throwing an object in response to the parent's behavior). Very high negativity receives a 7.

During Father-Child Puzzle Challenge Task – measures the child's behavior with the father during the puzzle completion task.

Engagement – measures the extent to which the child shows, initiates, or maintains interaction with the father. This may be expressed by approaching or orienting toward the father, establishing eye contact with the father, positively responding to the father's suggestions, positive affect directed toward the father and/or engaging the father in the puzzle task. Very high engagement receives a 7.

Persistence – measures how goal-oriented, focused, and motivated the child remains toward the puzzle throughout the task. The focus of this measure is on the child's apparent effort to solve the puzzle, not on how well the child performs. Very high persistence receives a 7.

Frustration with Task – measures the degree to which the child expresses frustration or anger toward the puzzle task, for example, by putting hands in lap, whining, pushing away puzzle pieces, crying about the puzzle, saying it is too hard, or throwing puzzle pieces. Very high frustration receives a 7.

TABLE C.2C

DESCRIPTIVE INFORMATION FOR COMPOSITE VARIABLES CONSTRUCTED FROM 36-MONTH FATHER INTERVIEWS AND FATHER-CHILD INTERACTIONS, FOR THE FULL FATHER STUDY SAMPLE

Measure	Sample Size	Possible Range		Range		Mean	Standard Deviation	Internal Consistency Reliability[a]
		Minimum	Maximum	Minimum	Maximum			
Father Activities with Child								
Frequency of Caregiving Activities Score	670	1	70	1	70	49.8	11.1	0.84
Frequency of Social Activities Score	670	1	73	1	73	49.8	11.8	0.79
Frequency of Cognitive Activities Score	671	1	73	1	73	49.6	11.1	0.79
Frequency of Physical Play Score	671	1	73	1	73	49.7	10.8	0.72
Father Well-Being								
Parenting Stress Index (PSI) Parental Distress	642	12	60	12	43	19.5	5.8	0.79
PSI Parent-Child Dysfunctional Interaction	643	12	60	11	36	14.3	4.2	0.81
CES-D: Not at Risk of Depression	622	0	1	0	1	0.6	0.5	NA
CES-D: Severe Depressive Symptoms	622	0	1	0	1	0.1	0.3	NA
Family Environment Scale (FES) Family Conflict	671	1	4	1	3.5	1.4	0.5	0.67
Discipline Strategies								
Index of Severity of Discipline Strategies	646	1	5	1	5	3.3	1.6	NA
Percentage of Fathers Who Spanked the Child in the Past Week	624	0	1	0	1	0.3	0.5	NA
Percentage of Parents Who Would Use Mild Discipline Only	647	0	1	0	1	0.4	0.5	NA
Parenting Behavior								
Supportiveness During Father-Child Semistructured Play	302	1	7	2	6.3	4.1	1.0	0.86
Intrusiveness During Father-Child Semistructured Play	302	1	7	1	4	1.4	0.7	NA
Quality of Assistance During Father-Child Puzzle Challenge Task	298	1	7	1	6	3.3	1.1	NA
Intrusiveness During Father-Child Puzzle Challenge Task	298	1	7	1	7	2.6	1.3	NA

TABLE C.2C *(continued)*

Measure	Sample Size	Possible Range Minimum	Possible Range Maximum	Range Minimum	Range Maximum	Mean	Standard Deviation	Internal Consistency Reliability[a]
Child Behavior with Father								
Child Behavior Checklist: Aggressive Behavior	635	0	38	0	34	10.7	6.0	0.85
Engagement of Father During Father-Child Semistructured Play	303	1	7	2	7	5.0	0.9	NA
Sustained Attention with Objects During Father-Child Semistructured Play	302	1	7	2	7	5.1	0.9	NA
Negativity Toward Father During Father-Child Semistructured Play	303	1	7	1	3	1.1	0.3	NA
Engagement of Father During Father-Child Puzzle Challenge Task	300	1	7	2	7	5.2	0.8	NA
Persistence During Father-Child Puzzle Challenge Task	300	1	7	2	7	4.9	1.1	NA
Frustration During Father-Child Puzzle Challenge Task	300	1	7	1	6	2.3	1.2	NA

Source: Father interviews and assessments of father-child videotaped interactions conducted when children were approximately 36 months old.

[a]Reliability was estimated using Cronbach's coefficient alpha formula.

C.3 CONSTRUCTION OF TIMELINES

The employment- and education-related outcome variables were constructed from weekly timelines signifying whether the primary caregiver was employed or in a school or training program in each *week* during the 26 months after random assignment. Similarly, the welfare-related and some child care-related outcome variables were constructed using *monthly* timelines signifying whether the family was receiving various forms of public assistance benefits and using child care in each month. These timelines were constructed using data from the 6-, 15-, and 26-month Parent Service Interviews.

Timelines were constructed using start and end dates of spells. Positive integers were used to signify that the caregiver was in a spell in a week (month) after random assignment. If the reported *day* that a spell started or ended was missing, we set the day to "15." However, if the month or year was missing, the relevant timeline entries were set to "missing" using alphabetic codes. A timeline entry could have multiple codes pertaining to overlapping spells. For example, a code of '1B' signified that the caregiver was working on the first job reported in the survey, but also that we were unsure whether she was working on job 2.

The variables pertaining to weeks (months) spent employed, in school or training, or on welfare during the 26 months after random assignment were constructed by summing the number of weeks (months) that the relevant timelines had positive codes. The variables were set to zero if the family had no spells, and they were set to "missing" if any timeline entry had a missing code but no positive code. Similarly, variables pertaining to hours spent in employment, education activities, and child care were constructed using the timelines and survey information on the number of hours per week the caregiver or child usually spent in each activity. Finally, we constructed variables pertaining to the amount of public assistance benefits that were

received using the welfare timelines and information on the monthly amount of benefits received for each spell of receipt.

C.4 TABLES OF NONMISSING VALUES FOR CONSTRUCTS

In the body of this report, all sample sizes given in tables of findings are for the full sample of respondents to the relevant data source (such as the 26-month parent services interview or the 36-month Bayley). One important characteristic of the Early Head Start data is that most parents and children who responded at all completed most of the questions and items and have data for the constructs derived in the impact analyses described in the body of this report.

The variables are organized by type, with the service-use variables listed first, followed by the child, parenting, and family outcomes. Although in a few cases response rates are below 90 percent, as Table C.4A shows, 99 percent or more of the respondents completed the vast majority of items.

TABLE C.4A

DATA ITEM RESPONSE FOR KEY OUTCOME MEASURES USED IN THE
EARLY HEAD START INTERIM IMPACT ANALYSIS,
BY RESEARCH STATUS

Outcome Measure	Program Group	Control Group
Service Receipt		
Received Any Key Services	99.3	97.2
Received Any Home Visits or Center-Based Child Care	98.6	94.4
Received More Than 1 Home Visit or 2 Weeks Center-Based Child Care	98.0	92.7
Received Home Visits or Center Care at Required Intensity in At Least 1 Followup	82.0	81.1
Received Home Visits or Center Care at Required Intensity in All 3 Followups	82.0	81.1
Received Any Home Visits	99.9	98.9
Received Any Child Development Services During Home Visits	99.9	99.8
Received Weekly Home Visits		
1st Followup	94.2	95.2
2nd Followup	95.1	97.0
3rd Followup	96.6	98.4
Received Weekly Home Visits in At Least 1 Followup	88.4	92.2
Received Weekly Home Visits in All 3 Followups	88.4	92.2
Received Any Child Care	91.8	90.0
Received Any Center-Based Child Care	93.4	93.3
Average Hours/Week of Center-Based Child Care	93.4	93.3
Received Child Care in Concurrent Arrangements	91.8	90.0
Average Weekly Out-of-Pocket Cost of Care	91.8	89.9
Received a Child Care Subsidy	71.7	71.5
Participated in Any Case Management Meeting	99.7	99.7
Weekly Case Management		
1st Followup	93.2	92.7
2nd Followup	97.4	98.1
3rd Followup	98.6	98.9
Participated in Any Group Parenting Activity	99.2	98.6
Participated in Any Group Parent-Child Activities	98.3	98.4
Child Was Identified with a Disability	97.6	96.8
Received Early Intervention Services for Child with a Disability	99.8	99.8
Percentage of Children Who Received Any Health Services	99.7	99.7
Percentage of Children Who Visited a Doctor	94.4	95.5
Percentage of Children Who Visited an Emergency Room	99.0	99.2
Average Number of Emergency Room Visits for Treatment of Accident/Injury	100.0	100.0
Percentage of Children Who Visited a Dentist	99.3	99.5
Percentage of Children Who Received Any Screening Test	99.2	99.5
Percentage of Children Who Received Any Immunizations	99.9	99.9
Received Any Education-Related Services	100.0	99.9
Received Any Employment-Related Services	94.6	81.5
Received Any Family Health Services	98.6	99.0
Received Any Family Mental Health Services	99.9	99.8
Received Any Transportation Assistance	100.0	99.9
Received Any Housing Assistance	96.9	96.7
Child Cognitive and Language Development		
Bayley Mental Development Index	79.4	77.7
Percent with Bayley MDI Below 85	79.4	77.7
PPVT-III Standard Score	67.9	67.0
Percentage with PPVT-III Below 85	67.9	67.0

Table C.4A (*Continued*)

Outcome Measure	Program Group	Control Group
Child Social-Emotional Development		
Bayley Behavior Rating Scale (BRS): Emotional Regulation	83.8	83.0
Bayley BRS: Orientation/Engagement	84.6	83.1
Child Behavior Checklist: Aggressive Behavior	96.6	95.9
Sustained Attention with Objects During Parent-Child Semistructured Play	78.0	79.0
Negativity Toward Parent During Parent-Child Semistructured Play	78.2	79.0
Engagement During Parent-Child Semistructured Play	78.2	79.0
Engagement During Parent-Child Puzzle Challenge Task	78.3	77.6
Persistence During Parent-Child Puzzle Challenge Task	77.9	77.0
Frustration During Parent-Child Puzzle Challenge Task	78.1	77.5
Child Health Status		
Child's Health Status	99.7	99.9
Percentage of Children in Fair or Poor Health	99.7	99.9
Quality of the Home Environment and Parenting: Overall and Physical Environment		
Home Observation for Measurement of the Environment (HOME) Total Score	84.8	86.5
HOME Internal Physical Environment	83.4	85.1
Parenting Behavior: Emotional Support		
HOME: Warmth	84.2	85.9
Supportiveness During Parent-Child Semistructured Play	79.0	78.2
Supportive Presence During Parent-Child Puzzle Challenge Task	78.3	77.8
Parenting Behavior: Stimulation of Language and Learning		
Quality of Assistance During Parent-Child Puzzle Challenge Task	78.2	77.8
HOME Support of Language and Literacy	87.7	88.7
Parent-Child Play	98.2	98.6
Percentage of Children with a Regular Bedtime	99.8	99.6
Percentage of Children Who Follow a Bedtime Routine	99.5	99.4
Percentage of Parents Who Read to Child Daily	97.8	98.6
Percentage of Parents Who Read to Child at Bedtime	99.5	99.4
Parenting Behavior: Negative Parenting Behavior		
Detachment During Parent-Child Semistructured Play	79.0	78.2
Detachment During Parent-Child Puzzle Challenge Task	78.3	77.7
Intrusiveness During Parent-Child Semistructured Play	79.0	78.2
Intrusiveness During Parent-Child Puzzle Challenge Task	78.2	77.8
Negative Regard During Parent-Child Semistructured Play	79.0	78.2
HOME: Harshness	84.7	86.0
Percentage of Parents Who Spanked Child in the Past Week	96.2	96.1
Knowledge of Safely Practices and Discipline Strategies		
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy	99.8	99.7
Percentage of Parents Who Would Use Mild Discipline Only	99.8	99.7
Index of Severity of Discipline Strategies	99.8	99.7
Percentage of Parents Who Always Use a Car Seat	99.7	99.7

Table C.4A (*Continued*)

Outcome Measure	Program Group	Control Group
Parent Physical and Mental Health		
Parenting Stress Index (PSI): Parental Distress	97.2	97.4
PSI: Parent-Child Dysfunctional Interaction	96.7	94.8
Family Environment Scale (FES): Family Conflict	86.4	87.0
Center for Epidemiological Studies Depression (CES-D; Short Form)	98.9	99.7
CES-D Severe Depressive Symptoms	98.9	99.7
Parent's Health Status	98.7	99.7
Father Presence		
Currently Married to Biological Father	95.3	95.4
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent	95.3	95.4
Biological Father Currently Present in Child's Life	92.3	92.9
Continuous Biological Father Presence Child Age 14-36[a]	86.0	88.2
No Biological Father Presence Child Age 14-36 [a]	86.0	88.2
Continuous Male Presence Child Age 14-36 [a]	91.1	92.6
No Continuous Male Presence Child Age 14-36 [a]	91.1	92.6
Any Self-Sufficiency Activities		
Percentage of Parents Ever Employed or in an Education or Job Training in First 26 Months	99.9	99.4
1st Quarter	99.5	99.1
2nd Quarter	99.4	98.9
3rd Quarter	98.2	98.2
4th Quarter	97.6	97.6
5th Quarter	98.3	97.4
6th Quarter	96.8	97.4
7th Quarter	96.7	97.8
8th Quarter	96.6	98.1
Average Hours per Week Employed at All jobs and in Any Education or Training in First 26 Months	85.3	87.0
Employment Activities		
Percentage of Parents Ever Employed in First 26 Months	99.9	99.7
1st Quarter	99.6	99.6
2nd Quarter	99.6	99.3
3rd Quarter	98.8	99.1
4th Quarter	98.3	98.3
5th Quarter	98.6	98.4
6th Quarter	97.6	98.6
7th Quarter	97.0	98.8
8th Quarter	97.2	99.0
Average Hours per Week Employed at All Jobs in First 26 Months	90.1	92.0
Education Activities		
Percentage of Parents Who Ever Participated in an Education or Training Program in First 26 months	98.5	99.0
1st Quarter	99.5	99.4
2nd Quarter	99.1	98.9
3rd Quarter	98.4	98.2
4th Quarter	98.0	98.3
5th Quarter	98.2	98.1
6th Quarter	97.0	96.9
7th Quarter	97.1	97.4

Table C.4A (*Continued*)

Outcome Measure	Program Group	Control Group
8th Quarter	97.2	98.0
Average Hours Per Week in an Education Program During First 26 Months	94.1	94.5
Types of Education Activities		
High School	99.3	99.7
English as a Second Language	99.6	99.4
Any Vocational Education	98.9	99.3
Highest Grade Completed at Third Followup:		
GED Certificate	99.7	99.7
High School Diploma	99.5	99.7
Welfare Program Participation		
Percentage of Parents Who Received Any Welfare Benefits during First 26 Months	97.8	97.2
Total Welfare Benefits Received during First 26 Months	70.9	70.6
Percentage of Parents Who Received AFDC or TANF Benefits during first 26 Months	96.9	96.9
1st Quarter	96.4	96.0
2nd Quarter	96.8	96.8
3rd Quarter	89.9	89.5
4th Quarter	87.0	87.5
5th Quarter	86.2	85.9
6th Quarter	77.1	77.3
7th Quarter	73.8	74.3
8th Quarter	73.9	74.1
Total AFDC or TANF Benefits Received during First 26 Months	83.5	85.0
Percentage of Parents Who Received Food Stamp Benefit during First 26 Months	98.2	97.8
Average Total Food Stamp Benefit Received during First 26 Months	82.7	82.9
Family Income and Resources		
Percentage of families with Income above the Poverty Line at Third Followup	93.8	93.8
Subsequent Births		
Subsequent Birth by 24 Months after Random Assignment	85.3	84.8

SOURCE: 36-month parent interviews and Bayley and video assessments, and 6-, 15-, and 26-month parent services interviews.

[a]Data Sources for longitudinal father outcomes are 14-, 24-, and 36-month parent interviews.

C.5 IMPLEMENTATION MEASURES

The first step to measuring the extent of program implementation is establishing a clear definition of a fully implemented program. For the purposes of this research, we defined the degree of implementation as the extent to which programs offered services that met the requirements of the Early Head Start grant announcement (U.S. Department of Health and Human Services 1995) and selected key elements of the revised Head Start Program Performance Standards (U.S. Department of Health and Human Services 1996). We defined "full implementation" as substantially implementing, or exceeding expectations for implementing, these key program elements.

To assess the extent of program implementation, we developed implementation rating scales, checklists for organizing the information needed to assign ratings to programs, and a rating process. We designed this rating system to help us reduce a large amount of information on program implementation into summary variables for testing hypotheses about how implementation relates to outcomes and to systematically analyze the research programs' progress toward full implementation over time. This sections describes our data sources, the rating scales we developed, and the rating process we followed for assessing implementation.[1]

a. Data Sources

For these analyses, we relied primarily on information collected during site visits conducted in fall 1997 and fall 1999 and self-administered surveys completed by program staff at the time of the site visits. To facilitate the systematic assignment of implementation ratings for each program, site visitors assembled the site visit and staff survey information in checklists organized

[1]More detailed information about the implementation analysis can be found in *Pathways to Quality* (Administration on Children, Youth and Families 2002).

according to key program elements of the performance standards. In addition, site visitors wrote detailed program profiles based on information obtained during the site visits. Program directors and their local research partners reviewed the profiles and checklists for their programs, provided corrections of erroneous information, and in some cases provided additional clarifying information.

b. Implementation Rating Scales

To develop implementation rating scales, we identified specific criteria for determining the degree to which programs implemented Early Head Start's three major program areas as defined in the performance standards: (1) early childhood development and health services, (2) family and community partnerships, and (3) program design and management. To refine our assessment, we created distinct criteria for both family and community partnerships. Likewise, within program design and management we created separate criteria for staff development and program management systems.

The criteria encompass key program requirements contained in the Early Head Start grant announcement and the performance standards. Because the purpose of the ratings was to identify and track over time the implementation of key program requirements and *not* to monitor compliance, we focused on key requirements needed to help us identify pathways to full implementation and to summarize and quantify a large amount of qualitative information on program implementation. We reviewed our initial criteria with representatives of the Head Start Bureau and the Early Head Start technical assistance network to ensure that they included the most important subset of program requirements. We also solicited comments from members of the Early Head Start Research Consortium. Table C.5A summarizes the 25 program elements we assessed organized according to program area.

TABLE C.5A

PROGRAM ELEMENTS INCLUDED IN THE EARLY HEAD START IMPLEMENTATION RATING SCALES

Scale	Program Element
Early Childhood Development and Health Services	
	Frequency of child development services
	Developmental assessments
	Follow-up services for children with disabilities
	Child health services
	Child care services
	Parent involvement in child development services
	Individualization of child development services
	Group socialization activities
Family and Community Partnerships	
Family Partnerships	Individualized family partnership agreements
	Availability of services
	Frequency of family development services
	Parent involvement
Community Partnerships	Collaborative relationships with other service providers
	Advisory committees
	Transition plans
Management Systems and Procedures	
Staff Development	Supervision
	Training
	Staff retention
	Compensation
	Staff morale
Program Management	Policy council
	Communication systems
	Goals, objectives, and plans
	Self-assessment
	Community needs assessment

Prior to our fall 1997 site visits, we created a rating scale for each of the program elements. In 1999, we made some minor revisions to these scales to reflect clarifications in program guidance from the Head Start Bureau and our evolving understanding of the performance standards, which took effect after our fall 1997 site visits. Each rating scale contains five levels of implementation, ranging from minimal implementation (level 1) to enhanced implementation (level 5) (Table C.5B). We considered programs rated at level 1 through 3 to have reached partial implementation and programs rated at levels 4 and 5 to have reached full implementation of the particular program element rated.

c. Rating Process

Following each round of site visits, we used a consensus-based process to assign implementation ratings to each Early Head Start research program. We assembled a rating panel that included four national evaluation team members, a representative of the Early Head Start technical assistance network, and another outside expert. For each program, three people—the site visitor and two panel members—assigned ratings independently, based information contained in the checklists and program profile compiled by the site visitor. Ratings were assigned for each of the 25 program elements, the five program areas, and for overall implementation. In completing the ratings of overall implementation, we established the following guidelines for creating the overall ratings based on the ratings of the individual program components:

- ***Low-Level Implementation:*** Programs that reached only a low level of implementation had achieved moderate implementation in only one or two program areas. Other programs areas were poorly or minimally implemented.
- ***Moderate Implementation:*** To achieve this rating, programs were (1) fully implemented in a few program areas and moderately implemented in the other areas, (2) moderately implemented in all areas, (3) moderately implemented in most areas

TABLE C.5B

EARLY HEAD START NATIONAL EVALUATION
IMPLEMENTATION RATING SCALE LEVELS

Level		Definition
Partial Implementation		
1	Minimal Implementation	Program shows little or no evidence of effort to implement the relevant program element
2	Low-Level Implementation	Program has made some effort to implement the relevant program element
3	Moderate Implementation	Program has implemented some aspects of the relevant program element
Full Implementation		
4	Full Implementation	Program has substantially implemented the relevant program element
5	Enhanced Implementation	Program has exceeded expectations for implementing the relevant program element

with low-level implementation in one area, or (4) fully implemented in every area except child development and health services.

- ***Full Implementation:*** To be rated as fully implemented overall, programs had to be rated as fully implemented in most of the five component areas. Reflecting the Head Start Bureau's focus on child development, panel members gave special consideration to the rating of child development and health services, and weighted it more heavily in arriving at their consensus rating of overall implementation.
- ***Enhanced Implementation:*** A program demonstrating enhanced implementation was fully implemented in all areas and exceeded the standards in some of the component areas.

After these independent ratings were completed for all programs, the panel met to review the three sets of independent ratings, discuss differences in ratings across panel members, and assign consensus ratings for each program. We checked the validity of the our 1997 ratings by comparing them to independent ratings. After the Head Start Bureau completed monitoring visits to all 17 research programs in spring 1998, we asked a member of the monitoring team to use information collected during the monitoring visits to rate programs' using the rating scales we developed. We did not share with the monitoring team our rating results or the information we collected during site visits. The independent ratings assigned by the monitoring team member were very similar to those assigned by our rating panel, providing some validation that our ratings provide a good assessment of program implementation.

APPENDIX C REFERENCES

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APPENDIX D

ANALYTIC ISSUES AND DETAILS

This appendix describes details of analyses conducted to test a number of assumptions underlying the analytic approach taken in our assessment of Early Head Start's impacts on children and families. The specific issues that we investigated and report here are:

- D.1 Comparing the Baseline Characteristics of Program and Control Group Members, p. D.5
- D.2 Assessing and Correcting for the Effects of Nonresponse to the Early Head Start Interviews and Assessments, p. D.13
- D.3 Estimating Impacts per Participant, p. D.37
- D.4 Assessing the Robustness of Study Findings, p. D.41
- D.5 Results from the Growth Curve Analysis, p. D.49
- D.6 Estimating Impacts per Eligible Applicant, p. D.65
- D.7 Results from the Service Intensity Analysis, p. D.83
- D.8 Results from Rerun of 24-month Child and Family Outcomes, p. D.115
- D.9 Analyses of Parenting Outcomes at 24 Months as Mediators of Child Outcomes at 36 Months, p. D.141

D.1 COMPARING THE BASELINE CHARACTERISTICS OF PROGRAM AND CONTROL GROUP MEMBERS

In theory, randomized experimental designs ensure that differences in the average outcomes between program and control groups can be attributed to the intervention under investigation. This rigor is possible, however, only if the random assignment process generates program and control groups with similar characteristics, on average, at the time of random assignment. Thus, the benefits of the random assignment design can be realized only if random assignment is implemented correctly and produces equivalent research groups.

We believe that the process used in the Early Head Start study to randomly assign families to the program or control groups was implemented correctly. MPR staff controlled the process, random numbers generated from a computer were used to assign the families to a research status, and, to the best of our knowledge, local programs and research staff followed the specified procedures for obtaining applicants and notifying families of their group assignment.

In this appendix, we compare the characteristics of program and control group families to check that the random assignment process was implemented correctly. First, we discuss data sources and methods and then discuss analysis results.

1. Data Sources and Methods

We used data from the Head Start Family Information System (HSFIS) application and enrollment forms for the analysis. This information was collected *prior* to random assignment, so neither the quality of the data nor item response should differ by research status if random assignment was conducted properly. The HSFIS data contain demographic information on families, primary caregivers, and focus children.

We used standard statistical tests to assess the similarity of the two research groups, including univariate t-tests to compare variable means for binary and continuous variables and

chi-square tests to compare distributions of categorical variables. In addition, we conducted a more formal multivariate analysis to test the hypothesis that variable means and distributions are *jointly* similar. For this analysis, we estimated logit regression models, where the probability that a family is in the program group was regressed on the HSFIS variables; we used chi-square tests to assess whether the coefficients on these explanatory variables were jointly significant. This multivariate procedure adjusts for the fact that univariate tests are expected to produce some significant test statistics by chance, even when the program and control groups are identical. For example, if the hypothesis tests are conducted at the 10 percent level of significance, then we would expect that 10 percent of independent tests would be falsely rejected. The multivariate procedure also accounts for correlations across measures, whereas the univariate procedure assumes that the measures are independent.

For several reasons, our main approach was to conduct the analysis using the sample pooled across all 17 research sites, rather than conduct separate analyses by site. First, pooling increases the power of the statistical tests. Second, it allows us to examine more HSFIS variables, because some variables vary little within sites. Finally, and most important, we used the *same* random assignment procedures for each site, so that we had no reason to believe that there would be differences in results across sites. However, we also conducted the analysis separately by site for selected HSFIS variables and display *p*-values for these tests.

2. Analysis Results

Table D.1A displays analysis results for the sample pooled across the 17 research sites. The table displays variable distributions for the program and control groups, as well as *p*-values for testing differences across the two groups. Table D.1B displays *p*-values by site for 12 selected variables.

TABLE D.1A

COMPARISON OF THE BASELINE CHARACTERISTICS OF ALL PROGRAM AND CONTROL GROUP MEMBERS

Variable	Program Group	Control Group	P-Value for Testing Differences
Site Characteristics			
Program Approach			.813
Center-based	20.2	20.6	
Home-based	46.7	45.6	
Mixed	33.0	33.9	
Overall Implementation Pattern			.957
Early implementers	34.5	34.8	
Later implementers	35.0	35.1	
Incomplete implementers	30.5	30.0	
Family and Parent Characteristics			
Age of Mother at Birth of Focus Child			.803
Younger than 20	39.0	39.5	
20 to 25	33.2	32.0	
25 or older	27.9	28.5	
Mother Was Younger than 19 at First Birth	42.9	41.2	.336
Highest Grade Completed			.175
Less than 12	47.7	47.8	
12 or earned a GED	27.3	29.8	
More than 12	24.9	22.4	
Race and Ethnicity			.968
White non-Hispanic	37.3	37.1	
Black non-Hispanic	34.2	35.0	
Hispanic	23.8	23.4	
Other (Asian or Pacific Islander, American Indian, Eskimo, Aleut)	4.7	4.5	
Primary Occupation			.826
Employed	22.9	23.8	
In school or a training program	22.0	21.4	
Other	55.0	54.7	

TABLE D.1.A *(continued)*

Variable	Program Group	Control Group	P-Value for Testing Differences
English Language Ability			.485
Primary language is English	79.9	78.1	
Primary language is not English but the applicant speaks English well	9.6	10.3	
Primary language is not English and the applicant does not speak English well	10.5	11.6	
Living Arrangements			.762
Living with a spouse	24.9	25.4	
Living with other adults	38.3	39.1	
Living with no other adults	36.8	35.5	
Adult Male Present in the Household	38.1	39.1	.586
Number of Adults in the Household[a]			.804
1	37.8	36.6	
2	49.8	50.8	
3 or more	12.4	12.6	
Number of Children Less than 5 Years Old in the Household Other than the Focus Child			.781
0	64.3	65.1	
1	27.0	26.8	
2 or more	8.7	8.1	
Number of Children Between 6 and 17 in the Household			.454
0	64.3	66.4	
1	23.1	21.3	
2 or more	12.6	12.3	
Number of Moves in the Past Year			.884
0	49.5	49.8	
1	28.9	28.1	
2 or more	21.6	22.1	
Owns Home	11.0	11.1	.907

TABLE D.1.A *(continued)*

Variable	Program Group	Control Group	P-Value for Testing Differences
			.257
Household Income as a Percent of the Poverty Level (Percent)			
Less than 33	30.2	30.0	
33 to 67	32.5	29.2	
67 to 99	24.0	26.5	
100 or more	13.3	14.3	
Welfare Receipt			
AFDC/TANF[a]	35.6	34.7	.627
Food Stamps	48.0	47.8	.889
Medicaid	76.6	74.7	.217
SSI	7.0	7.0	.978
WIC	87.5	85.9	.235
Public housing	9.5	8.9	.565
Has Inadequate Resources			
Food	4.9	6.3	.111
Housing	12.3	13.3	.432
Money to buy necessities	20.8	21.7	.588
Medical care	14.0	14.7	.577
Transportation	20.9	22.4	.334
Child care	34.4	34.6	.913
Money for supplies	27.1	29.4	.280
Support from friends	12.9	14.0	.414
Parent information	12.5	16.3	.005*
Maternal Risk Index[c]			.469
0 or 1 (low risk)	18.8	17.3	
2 or 3 (moderate risk)	54.2	56.4	
4 or 5 (high risk)	27.1	26.3	
Random Assignment Date			.808
Before 10/96	36.0	36.5	
10/96 to 6/97	30.2	30.8	
After 6/97	33.8	32.7	
Previously Enrolled in Head Start or Another Childhood Development Program[b]	12.8	13.4	.628

TABLE D.1.A *(continued)*

Variable	Program Group	Control Group	P-Value for Testing Differences
Characteristics of Focus Child			
Age (Months)			.330
Unborn	24.2	26.5	
Less than 5	36.1	34.7	
5 or more	39.7	38.7	
Male	51.7	50.4	.493
First Born	62.3	62.8	.783
Birthweight Less than 2,500 Grams[b]	9.9	8.4	.237
Born more than 3 Weeks Early[b]	15.8	12.0	.014*
Stayed in Hospital After Birth[b]	18.3	16.0	.178
People Concerned About the Child's Overall Health and Development[b]	13.0	13.3	.870
Received an Evaluation Because of Concerns About the Child's Overall Health and Development or Because of Suspected Developmental Delay[b]	6.0	6.9	.412
Risk Categories			
Has established risks[b]	11.6	10.6	.444
Has biological or medical risks[b]	18.3	16.8	.396
Has environmental risks[b]	32.5	36.4	.062*
Covered by Health Insurance[b]	90.1	89.6	.723
Sample Size	**1,513**	**1,488**	

SOURCE: HSFIS application and enrollment forms.

[a]The primary caregiver is considered to be an adult regardless of her age.

[b]These variables pertain to families with focus children who were born at baseline.

[c]This index was constructed by summing the number of the following risk factors that the mother faced: (1) being a teenage mother; (2) having no high school credential; (3) receiving public assistance; (4) not being employed or in school or training, and (5) being a single mother.

*Significantly different from zero at the .10 level, two-tailed test.

TABLE D.1B

P-VALUES FROM TESTS COMPARING THE BASELINE CHARACTERISTICS OF PROGRAM AND CONTROL GROUP MEMBERS, BY SITE

Site	Mother's Age	Mother's Education	Race and Ethnicity	Mother's Primary Occupation	Living Arrangements	Received AFDC or TANF	Received Food Stamps	Maternal Risk Index	Random Assignment Date	Child's Age	Child's Gender
1	.446	.903	.211	.976	.459	.820	.707	.809	.970	.576	.027*
2	.165	.482	.252	.948	.472	.700	.734	.820	.615	.400	.227
3	.927	.782	.795	.219	.073*	.107	.041*	.138	.981	.626	.896
4	.748	.496	.434	.722	.662	.682	.401	.131	1.00	.939	.951
5	.550	.158	.190	.559	.694	.361	.808	.840	.845	.464	.308
6	.863	.943	.505	.393	.598	.611	.757	.715	.666	.344	.952
7	.978	.084*	.840	.071*	.052*	.147	.726	.893	.924	.541	.677
8	.824	.355	.683	.499	.773	.115	.858	.879	1.00	.749	.778
9	.970	.217	.579	.533	.401	.326	.791	.286	.985	.306	.362
10	.594	.786	.507	.619	.680	.225	.331	.185	.707	.592	.951
11	.749	.534	.405	.326	.755	.402	.075*	.156	.454	.040*	.215
12	.549	.716	.739	.411	.681	.200	.095*	.083*	.990	.967	.698
13	.003*	.996	.824	.735	.367	.051*	.920	.406	.670	.751	.347
14	.381	.540	.387	.884	.993	.984	.403	.417	.948	.417	.402
15	.744	.880	.395	.343	.766	.776	.934	.469	.924	.911	.453
16	.075*	.622	.622	.464	.492	.142	.887	.244	.791	.242	.867
17	.733	.804	.367	.188	.358	.122	.895	.714	1.00	.457	.496

SOURCE: HSFIS application and enrollment forms.

*Statistically different from zero at the .10 level, two-tailed test.

The results indicate that random assignment produced program and control groups with equivalent characteristics. For the full sample, the program and control group differences are statistically significant at the 10 percent level for only 3 of the 47 univariate tests (which is less than the approximately 5 tests that would be expected by chance), and only 4 of the tests are statistically significant at the 15 percent level. Furthermore, the joint test from the multivariate regression model yields a *p*-value of .630. Finally, very few (15 of 207) univariate tests for 12 key variables are rejected at the 10 percent level across the sites, and the significant test statistics are scattered across sites and variables. We conclude that random assignment produced equivalent research groups.

D.2 ASSESSING AND CORRECTING FOR THE EFFECTS OF NONRESPONSE TO THE EARLY HEAD START INTERVIEWS AND ASSESSMENTS

In the previous section, we examined the baseline characteristics of program and control group members in the full analysis sample and concluded that they were similar. However, as discussed in Chapter II, not all sample members completed the follow-up interviews and assessments. The response rate was about 70 percent to the 26-month parent services interview (PSI), 70 percent to the 36-month birthday-related parent interview (PI), and 55 percent to the Bayley and video assessments. Furthermore, response rates differed somewhat across sites and subgroups defined by site and family characteristics at baseline. Thus, it was important to test whether program group members who responded to the interviews are fully representative of all program group members, and whether control group members who responded to the interviews are fully representative of all control group members. Furthermore, it was important to test whether the baseline characteristics of *respondents* in the two research groups differ from each other.

If not corrected, the effects of interview nonresponse could lead to two problems:

1. ***The impact estimates could be biased.*** This would occur if the differences in the average baseline characteristics of respondents in the program and control groups were correlated with the outcome variables, and hence, the impact estimates.
2. ***The impact estimates might not be generalizable to the study population of eligible families.*** This would occur if the differences between interview respondents and nonrespondents were correlated with the outcome variables (regardless of whether or not the average characteristics of program group and control group respondents were similar).

In this appendix, we assess the effects of nonresponse and discuss procedures that we used to adjust for potential nonresponse effects.

1. Assessing the Effects of Nonresponse

Our basic approach for assessing the effects of nonresponse to key data sources was to compare the baseline characteristics of (1) respondents in the program and control groups, and (2) respondents to the full sample of respondents and nonrespondents in each research group. We conducted this analysis using data from the HSFIS application and enrollment forms, and with the same methods that we used to compare the baseline characteristics of the full program and control groups (see Appendix D.1). To keep the presentation manageable, we focus our analysis on the 26-month PSI and the 36-month birthday-related interviews and assessments.[1]

Tables D.2A to D.2D display the following results from the nonresponse analysis, with separate tables displayed for each data source:

1. Variable distributions for interview respondents, by research status
2. Significance levels for tests of differences between the characteristics of respondents in the program and control groups
3. Variable distributions for the full sample of respondents and nonrespondents, by research status
4. Significance levels for tests of differences between respondents and the full sample of respondents and nonrespondents, by research status

We find some differences in the characteristics of respondents and the full sample of respondents and nonrespondents for each research group and data source. Response rates for the program group were higher in center-based programs than in home-based or mixed-approach programs, and response rates for both research groups were higher in "fully implemented" programs than in programs that were not fully implemented. Response rates increased with the

[1]Analysis results for the 15-month PSI and the 24-month interviews and assessments are presented in Appendix D of our interim impact report, and are very similar to the 36-month results.

TABLE D.2A

COMPARISON OF THE BASELINE CHARACTERISTICS OF RESPONDENTS AND THE FULL SAMPLE OF RESPONDENTS AND NONRESPONDENTS TO THE 26-MONTH PSI, BY RESEARCH STATUS

	Respondents		Respondents and Nonrespondents	
Variable	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
Site Characteristics				
Program Approach				
Center-based	21.4	20.2	20.2	20.6*
Home-based	45.4	44.8	46.7	45.6
Mixed	33.3	35.0	33.0	33.9
Overall Implementation Pattern				
Early implementers	34.0	36.3	34.5*	34.8*
Later implementers	38.1	37.0	35.0	35.1
Incomplete implementers	27.9	26.7	30.5	30.0
Family and Parent Characteristics				
Age of Mother at Birth of Focus Child				
Younger than 20	38.7	38.9	39.0	39.5
20 to 25	32.6	33.4	33.2	32.0
25 or older	28.6	27.8	27.9	28.5
Mother Was Younger than 19 at First Birth	42.1	40.4	42.9	41.2
Highest Grade Completed				
Less than 12	45.8	46.2	47.7*	47.8*
12 or earned a GED	28.2	29.2	27.3	29.8
More than 12	26.0	24.6	24.9	22.4
Race and Ethnicity				
White non-Hispanic	37.2	38.2	37.3*	37.1
Black non-Hispanic	35.3	34.1	34.2	35.0
Hispanic	23.7	22.8	23.8	23.4
Other (Asian or Pacific Islander, American Indian, Eskimo, Aleut)	3.9	4.9	3.9	4.9
Primary Occupation				
Employed	24.3	23.2	37.2	23.8
In school or a training program	22.2	21.0	35.3	21.4
Other	53.5	55.8	23.7	54.7

TABLE D.2.A *(continued)*

Variable	Respondents		Respondents and Nonrespondents	
	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
English Language Ability				
Primary language is English	79.7	78.6	79.9	78.1
Primary language is not English but the applicant speaks English well	9.1	10.5	9.6	10.3
Primary language is not English and the applicant does not speak English well	11.2	10.9	10.5	11.6
Living Arrangements				
Living with a spouse	25.7	26.9	24.9	25.4*
Living with other adults	38.5	40.4	38.3	39.1
Living with no other adults	35.9	32.7	36.8	5.5
Adult Male Present in the Household	39.6	40.8	38.1*	39.1*
Number of Adults in the Household[d]				
1	36.8	33.5	37.8	36.6*
2	50.1	53.0	49.8	50.8
3 or more	13.0	13.4	12.4	12.6
Number of Children Less than 5 Years Old in the Household Other than the Focus Child				
0	64.8	63.3	64.3	65.1*
1	26.3	27.9	27.0	26.8
2 or more	8.9	8.9	8.7	8.1
Number of Children Between 6 and 17 in the Household				
0	64.1	66.1	64.3	66.4
1	23.0	21.1	23.1	21.3
2 or more	12.8	12.8	12.6	12.3
Number of Moves in the Past Year				
0	51.1	51.2	49.5*	49.8
1	28.8	27.1	28.9	28.1
2 or more	20.1	21.7	21.6	22.1
Owns Home	12.0	12.0	11.0*	11.1
Household Income as a Percent of the Poverty Level (Percent)				
Less than 33	29.5	28.2	30.2	30.0*
33 to 67	31.7	31.7	32.5	29.2
67 to 99	24.2	26.7	24.0	26.5
100 or more	14.6	13.5	13.3	14.3

TABLE D.2.A *(continued)*

Variable	Respondents		Respondents and Nonrespondents	
	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
Welfare Receipt				
AFDC/TANF[e]	33.1	33.2	35.6*	34.7
Food Stamps	45.7	46.8	48.0*	47.8
Medicaid	75.4	75.0	76.6*	74.7
SSI	6.4	7.1	7.0	7.0
WIC	87.1	86.6	87.5	85.9
Public housing	9.6	9.0	9.5	8.9
Has Inadequate Resources				
Food	4.3	7.4*	4.9*	6.3*
Housing	11.8	12.5	12.3	13.3
Money to buy necessities	20.3	21.5	20.8	21.7
Medical care	12.7	14.5	14.0*	14.7
Transportation	21.1	23.0	20.9	22.4
Child care	34.2	34.8	34.4	34.6
Money for supplies	25.5	30.9*	27.1*	29.4
Support from friends	12.1	12.8	12.9	14.0*
Parent information	12.4	15.2*	12.5	16.3
Maternal Risk Index[f]				
0 or 1 (low risk)	21.0	17.8	19.0*	17.4
2 or 3 (moderate risk)	53.5	56.9	54.2	56.5
4 or 5 (high risk)	25.5	25.2	26.8	26.0
Random Assignment Date				
Before 10/96	35.7	35.4	36.0	36.5
10/96 to 6/97	30.3	32.3	30.2	30.8
After 6/97	34.0	32.2	33.8	32.7
Previously Enrolled in Head Start or Another Childhood Development Program[e]	12.3	14.1	12.8	13.4
Characteristics of Focus Child				
Age (Months)				
Unborn	25.0	27.5	24.2	26.5
Less than 5	34.8	34.2	36.1	34.7
5 or more	40.2	38.3	39.7	38.7
Male	50.7	50.2	51.7	50.4
First Born	62.6	60.6	62.3	62.8*
Birthweight Less than 2,500 Grams[e]	8.9	7.8	9.9	8.4
Born more than 3 Weeks Early[e]	14.8	11.5*	15.8	12.0

TABLE D.2.A *(continued)*

Variable	Respondents		Respondents and Nonrespondents	
	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
Stayed in Hospital After Birth[e]	17.0	15.8	18.3*	16.0
People Concerned About the Child's Overall Health and Development[e]	12.3	14.6	13.0	13.3*
Received an Evaluation Because of Concerns About the Child's Overall Health and Development or Because of Suspected Developmental Delay[e]	5.3	6.4	6.0	6.9
Risk Categories				
Has established risks[e]	11.0	10.5	11.6	10.6
Has biological or medical risks[e]	17.6	16.5	18.3	16.8
Has environmental risks[e]	31.8	38.1*	32.5	36.4*
Covered by Health Insurance[e]	91.3	91.4	90.1*	89.6*
Sample Size	**1,076**	**1,011**	**1,513**	**1,488**

SOURCE: HSFIS application and enrollment forms and 26-month PSI data.

[a]Significance levels are from tests comparing program and control group respondents.

[b]Significance levels are from tests comparing respondents and the full sample of respondents and nonrespondents in the program group.

[c]Significance levels are from tests comparing respondents and the full sample of respondents and nonrespondents in the control group.

[d]The primary caregiver is considered to be an adult regardless of her age.

[e]These variables pertain to families with focus children who were born at baseline.

[f]This index was constructed by summing the number of the following risk factors that the mother faced: (1) being a teenage mother; (2) having no high school credential; (3) receiving public assistance; (4) not being employed or in school or training, and (5) being a single mother.

*Significantly different from zero at the .10 level, two-tailed test.

TABLE D.2B

COMPARISON OF THE BASELINE CHARACTERISTICS OF RESPONDENTS AND THE FULL SAMPLE OF RESPONDENTS AND NONRESPONDENTS TO THE 36-MONTH PI, BY RESEARCH STATUS

	Respondents		Respondents and Nonrespondents	
Variable	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
Site Characteristics				
Program Approach				
Center-based	22.9	21.0	20.2*	20.6
Home-based	45.3	44.7	46.7	45.6
Mixed	31.7	34.3	33.0	33.9
Overall Implementation Pattern				
Early implementers	35.0	35.7	34.5*	34.8*
Later implementers	37.8	36.1	35.0	35.1
Incomplete implementers	27.2	28.2	30.5	30.0
Family and Parent Characteristics				
Age of Mother at Birth of Focus Child				
Younger than 20	37.9	38.7	39.0*	39.5
20 to 25	33.0	32.6	33.2	32.0
25 or older	29.1	28.7	27.9	28.5
Mother Was Younger than 19 at First Birth	42.3	40.6	42.9*	41.2
Highest Grade Completed				
Less than 12	45.3	45.5	47.7*	47.8*
12 or earned a GED	29.2	29.1	27.3	29.8
More than 12	25.5	25.4	24.9	22.4
Race and Ethnicity				
White non-Hispanic	39.6	39.9	37.3*	37.1*
Black non-Hispanic	32.5	33.9	34.2	35.0
Hispanic	23.8	21.6	23.8	23.4
Other (Asian or Pacific Islander, American Indian, Eskimo, Aleut)	4.1	4.6	4.7	4.5
Primary Occupation				
Employed	25.2	23.8	22.9*	23.8
In school or a training program	21.8	20.8	22.0	21.4
Other	52.9	55.4	55.0	54.7

TABLE D.2.B *(continued)*

Variable	Respondents		Respondents and Nonrespondents	
	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
English Language Ability				
Primary language is English	80.2	80.1	79.9	78.1*
Primary language is not English but the applicant speaks English well	8.9	10.2	9.6	10.3
Primary language is not English and the applicant does not speak English well	10.9	9.7	10.5	11.6
Living Arrangements				
Living with a spouse	26.0	27.0	24.9	25.4
Living with other adults	38.4	38.9	38.3	39.1
Living with no other adults	35.6	34.2	36.8	35.5
Adult Male Present in the Household	39.8	40.8	38.1*	39.1*
Number of Adults in the Household[d]				
1	36.8	35.1	37.8	36.6
2	50.3	51.5	49.8	50.8
3 or more	12.9	13.4	12.4	12.6
Number of Children Less than 5 Years Old in the Household Other than the Focus Child				
0	64.7	63.3	64.3	65.1
1	26.8	28.4	27.0	26.8
2 or more	8.5	8.3	8.7	8.1
Number of Children Between 6 and 17 in the Household				
0	63.1	65.6	64.3	66.4
1	24.4	21.3	23.1	21.3
2 or more	12.6	13.0	12.6	12.3
Number of Moves in the Past Year				
0	50.8	51.3	49.5	49.8
1	28.1	27.8	28.9	28.1
2 or more	21.1	20.8	21.6	22.1
Owns Home	12.2	12.3	11.0*	11.1*
Household Income as a Percent of the Poverty Level (Percent)				
Less than 33	29.2	28.0	30.2*	30.0
33 to 67	31.3	30.4	32.5	29.2
67 to 99	25.1	27.4	24.0	26.5
100 or more	14.3	14.1	13.3	14.3

TABLE D.2.B *(continued)*

Variable	Respondents		Respondents and Nonrespondents	
	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
Welfare Receipt				
AFDC/TANF[e]	32.7	33.4	35.6*	34.7
Food Stamps	45.9	46.4	48.0*	47.8
Medicaid	75.8	74.7	76.6	74.7
SSI	6.8	7.2	7.0	7.0
WIC	87.5	86.0	87.5	85.9
Public housing	10.0	8.6	9.5	8.9
Has Inadequate Resources				
Food	4.6	6.9*	4.9	6.3
Housing	11.9	12.1	12.3	13.3*
Money to buy necessities	19.7	20.4	20.8*	21.7*
Medical care	13.4	14.0	14.0	14.7
Transportation	20.7	22.1	20.9	22.4
Child care	33.3	34.2	34.4	34.6
Money for supplies	25.1	30.2*	27.1*	29.4
Support from friends	12.2	11.8	12.9	14.0*
Parent information	12.9	15.4*	12.5	16.3
Maternal Risk Index[f]				
0 or 1 (low risk)	21.2	19.2	19.0*	17.4*
2 or 3 (moderate risk)	54.3	55.9	54.2	56.5
4 or 5 (high risk)	24.5	25.0	26.8	26.0
Random Assignment Date				
Before 10/96	35.3	35.6	36.0*	36.5
10/96 to 6/97	28.5	31.3	30.2	30.8
After 6/97	36.2	33.1	33.8	32.7
Previously Enrolled in Head Start or Another Childhood Development Program[e]	13.1	14.0	12.8	13.4
Characteristics of Focus Child				
Age (Months)				
Unborn	23.9	25.6	24.2	26.5
Less than 5	35.2	35.1	36.1	34.7
5 or more	40.8	39.3	39.7	38.7
Male	51.0	50.1	51.7	50.4
First Born	61.7	60.9	62.3	62.8*
Birthweight Less than 2,500 Grams[e]	9.3	7.3	9.9	8.4*
Born more than 3 Weeks Early[e]	14.8	11.5*	15.8	12.0

TABLE D.2.B *(continued)*

Variable	Respondents		Respondents and Nonrespondents	
	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
Stayed in Hospital After Birth[e]	17.4	16.2	18.3	16.0
People Concerned About the Child's Overall Health and Development[e]	12.7	14.4	13.0	13.3
Received an Evaluation Because of Concerns About the Child's Overall Health and Development or Because of Suspected Developmental Delay[e]	5.5	6.4	6.0	6.9
Risk Categories				
Has established risks[e]	11.6	10.2	11.6	10.6
Has biological or medical risks[e]	17.4	16.9	18.3	16.8
Has environmental risks[e]	31.9	36.6*	32.5	36.4
Covered by Health Insurance[e]	91.4	92.3	90.1*	89.6*
Sample Size	**1,107**	**1,003**	**1,513**	**1,488**

SOURCE: HSFIS application and enrollment forms and 36-month PI data.

[a]Significance levels are from tests comparing program and control group respondents.

[b]Significance levels are from tests comparing respondents and the full sample of respondents and nonrespondents in the program group.

[c]Significance levels are from tests comparing respondents and the full sample of respondents and nonrespondents in the control group.

[d]The primary caregiver is considered to be an adult regardless of her age.

[e]These variables pertain to families with focus children who were born at baseline.

[f]This index was constructed by summing the number of the following risk factors that the mother faced: (1) being a teenage mother; (2) having no high school credential; (3) receiving public assistance; (4) not being employed or in school or training, and (5) being a single mother.

*Significantly different from zero at the .10 level, two-tailed test.

TABLE D.2C

COMPARISON OF THE BASELINE CHARACTERISTICS OF RESPONDENTS AND THE FULL SAMPLE OF RESPONDENTS AND NONRESPONDENTS TO THE 36-MONTH BAYLEY ASSESSMENT, BY RESEARCH STATUS

	Respondents		Respondents and Nonrespondents	
Variable	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
Site Characteristics				
Program Approach				
Center-based	24.7	22.1	20.2*	20.6
Home-based	45.1	44.9	46.7	45.6
Mixed	30.3	33.0	33.0	33.9
Overall Implementation Pattern				
Early implementers	34.7	38.3	34.5*	34.8*
Later implementers	38.2	35.6	35.0	35.1
Incomplete implementers	27.1	26.2	30.5	30.0
Family and Parent Characteristics				
Age of Mother at Birth of Focus Child				
Younger than 20	38.8	41.0	39.0	39.5
20 to 25	31.4	31.0	33.2	32.0
25 or older	29.8	28.0	27.9	28.5
Mother Was Younger than 19 at First Birth	42.2	43.3	42.9	41.2*
Highest Grade Completed				
Less than 12	46.7	46.6	47.7	47.8
12 or earned a GED	28.1	29.0	27.3	29.8
More than 12	25.1	24.4	24.9	22.4
Race and Ethnicity				
White non-Hispanic	37.8	40.4	37.3*	37.1*
Black non-Hispanic	33.3	31.8	34.2	35.0
Hispanic	25.5	23.3	23.8	23.4
Other (Asian or Pacific Islander, American Indian, Eskimo, Aleut)	3.5	4.5	4.7	4.5
Primary Occupation				
Employed	26.7	23.8	22.9*	23.8
In school or a training program	23.0	21.1	22.0	21.4
Other	50.3	55.1	55.0	54.7

TABLE D.2C *(continued)*

Variable	Respondents		Respondents and Nonrespondents	
	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
English Language Ability				
Primary language is English	79.0	79.6	79.9	78.1
Primary language is not English but the applicant speaks English well	9.6	10.4	9.6	10.3
Primary language is not English and the applicant does not speak English well	11.5	10.0	10.5	11.6
Living Arrangements				
Living with a spouse	24.2	26.2	24.9	25.4
Living with other adults	40.3	39.3	38.3	39.1
Living with no other adults	35.5	34.5	36.8	35.5
Adult Male Present in the Household	39.1	39.4	38.1	39.1
Number of Adults in the Household[d]				
1	36.7	35.6	37.8	36.6
2	49.7	50.6	49.8	50.8
3 or more	13.5	13.8	12.4	12.6
Number of Children Less than 5 Years Old in the Household Other than the Focus Child				
0	65.4	64.3	64.3	65.1
1	26.5	27.1	27.0	26.8
2 or more	8.1	8.6	8.7	8.1
Number of Children Between 6 and 17 in the Household				
0	61.1	64.4	64.3*	66.4
1	25.3	22.0	23.1	21.3
2 or more	13.7	13.5	12.6	12.3
Number of Moves in the Past Year				
0	51.8	50.1	49.5*	49.8
1	28.4	28.4	28.9	28.1
2 or more	19.8	21.4	21.6	22.1
Owns Home	13.1	12.8	11.0*	11.1
Household Income as a Percent of the Poverty Level (Percent)				
Less than 33	29.7	28.0	30.2	30.0
33 to 67	30.6	30.9	32.5	29.2
67 to 99	26.0	28.2	24.0	26.5
100 or more	13.7	13.0	13.3	14.3

TABLE D.2C *(continued)*

Variable	Respondents		Respondents and Nonrespondents	
	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
Welfare Receipt				
AFDC/TANF[e]	33.2	33.6	35.6*	34.7
Food Stamps	45.4	46.0	48.0*	47.8
Medicaid	76.8	75.1	76.6	74.7
SSI	7.4	6.9	7.0	7.0
WIC	88.3	85.6	87.5	85.9
Public housing	10.3	8.6	9.5	8.9
Has Inadequate Resources				
Food	5.2	7.3*	4.9	6.3
Housing	11.9	12.6	12.3	13.3
Money to buy necessities	19.2	20.3	20.8*	21.7
Medical care	14.1	14.1	14.0	14.7
Transportation	21.3	21.6	20.9	22.4
Child care	32.4	33.8	34.4*	34.6
Money for supplies	23.5	32.0	27.1*	29.4*
Support from friends	12.1	11.8	12.9	14.0*
Parent information	12.6	16.3*	12.5	16.3
Maternal Risk Index[f]				
0 or 1 (low risk)	20.6	18.4	19.0*	17.4
2 or 3 (moderate risk)	54.5	55.4	54.2	56.5
4 or 5 (high risk)	24.9	26.1	26.8	26.0
Random Assignment Date				
Before 10/96	34.9	35.8*	36.0*	36.5
10/96 to 6/97	28.1	32.1	30.2	30.8
After 6/97	37.0	32.1	33.8	32.7
Previously Enrolled in Head Start or Another Childhood Development Program[e]	12.8	14.1	12.8	13.4
Characteristics of Focus Child				
Age (Months)				
Unborn	25.1	27.6	24.2	26.5
Less than 5	35.9	35.2	36.1	34.7
5 or more	38.9	37.2	39.7	38.7
Male	49.5	48.8	51.7*	50.4
First Born	61.9	61.2	62.3	62.8
Birthweight Less than 2,500 Grams[e]	8.9	6.6	9.9	8.4*
Born more than 3 Weeks Early[e]	13.7	10.5*	15.8*	12.0

TABLE D.2C *(continued)*

Variable	Respondents		Respondents and Nonrespondents	
	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
Stayed in Hospital After Birth[e]	17.2	15.2	18.3	16.0
People Concerned About the Child's Overall Health and Development[e]	12.3	13.3	13.0	13.3
Received an Evaluation Because of Concerns About the Child's Overall Health and Development or Because of Suspected Developmental Delay[e]	4.7	5.1	6.0*	6.9*
Risk Categories				
Has established risks[e]	10.8	10.4	11.6	10.6
Has biological or medical risks[e]	17.5	16.3	18.3	16.8
Has environmental risks[e]	31.6	36.6*	32.5	36.4
Covered by Health Insurance[e]	91.3	92.3	90.1	89.6*
Sample Size	**879**	**779**	**1,513**	**1,488**

SOURCE: HSFIS application and enrollment forms and 36-month Bayley assessment data.

[a]Significance levels are from tests comparing program and control group respondents.

[b]Significance levels are from tests comparing respondents and the full sample of respondents and nonrespondents in the program group.

[c]Significance levels are from tests comparing respondents and the full sample of respondents and nonrespondents in the control group.

[d]The primary caregiver is considered to be an adult regardless of her age.

[e]These variables pertain to families with focus children who were born at baseline.

[f]This index was constructed by summing the number of the following risk factors that the mother faced: (1) being a teenage mother; (2) having no high school credential; (3) receiving public assistance; (4) not being employed or in school or training, and (5) being a single mother.

*Significantly different from zero at the .10 level, two-tailed test.

TABLE D.2D

COMPARISON OF THE BASELINE CHARACTERISTICS OF RESPONDENTS AND THE FULL SAMPLE OF RESPONDENTS AND NONRESPONDENTS TO THE 36-MONTH VIDEO ASSESSMENT, BY RESEARCH STATUS

	Respondents		Respondents and Nonrespondents	
Variable	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
Site Characteristics				
Program Approach				
Center-based	26.0	23.1	20.2*	20.6*
Home-based	45.3	44.4	46.7	45.6
Mixed	28.7	32.5	33.0	33.9
Overall Implementation Pattern				
Early implementers	35.0	37.1	34.5*	34.8*
Later implementers	39.8	37.6	35.0	35.1
Incomplete implementers	25.2	25.3	30.5	30.0
Family and Parent Characteristics				
Age of Mother at Birth of Focus Child				
Younger than 20	37.9	40.3	39.0	39.5
20 to 25	32.8	30.9	33.2	32.0
25 or older	29.3	28.8	27.9	28.5
Mother Was Younger than 19 at First Birth	42.1	42.5	42.9	41.2
Highest Grade Completed				
Less than 12	47.0	46.3	47.7	47.8*
12 or earned a GED	29.3	28.1	27.3	29.8
More than 12	23.8	25.6	24.9	22.4
Race and Ethnicity				
White non-Hispanic	38.9	40.0	37.3*	37.1*
Black non-Hispanic	31.6	31.8	34.2	35.0
Hispanic	26.1	23.7	23.8	23.4
Other (Asian or Pacific Islander, American Indian, Eskimo, Aleut)	3.4	4.5	4.7	4.5
Primary Occupation				
Employed	26.5	25.0	22.9*	23.8
In school or a training program	22.9	20.5	22.0	21.4
Other	50.6	54.6	55.0	54.7

TABLE D.2D *(continued)*

Variable	Respondents		Respondents and Nonrespondents	
	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
English Language Ability				
Primary language is English	79.1	79.0	79.9	78.1*
Primary language is not English but the applicant speaks English well	9.5	11.4	9.6	10.3
Primary language is not English and the applicant does not speak English well	11.4	9.6	10.5	11.6
Living Arrangements				
Living with a spouse	25.3	27.3	24.9*	25.4*
Living with other adults	40.7	40.1	38.3	39.1
Living with no other adults	34.0	32.7	36.8	35.5
Adult Male Present in the Household	40.2	41.2	38.1*	39.1*
Number of Adults in the Household[d]				
1	35.2	33.5	37.8*	36.6*
2	51.3	51.7	49.8	50.8
3 or more	13.5	14.7	12.4	12.6
Number of Children Less than 5 Years Old in the Household Other than the Focus Child				
0	64.5	63.9	64.3	65.1
1	27.2	27.7	27.0	26.8
2 or more	8.2	8.5	8.7	8.1
Number of Children Between 6 and 17 in the Household				
0	62.0	64.3	64.3*	66.4
1	24.3	22.3	23.1	21.3
2 or more	13.7	13.4	12.6	12.3
Number of Moves in the Past Year				
0	51.4	50.2	49.5*	49.8
1	29.5	28.5	28.9	28.1
2 or more	19.0	21.3	21.6	22.1
Owns Home	12.9	12.4	11.0*	11.1
Household Income as a Percent of the Poverty Level (Percent)				
Less than 33	28.3	27.0	30.2*	30.0
33 to 67	30.6	30.7	32.5	29.2
67 to 99	26.9	28.1	24.0	26.5
100 or more	14.2	14.2	13.3	14.3

TABLE D.2D *(continued)*

Variable	Respondents		Respondents and Nonrespondents	
	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
Welfare Receipt				
AFDC/TANF[e]	33.2	31.3	35.6*	34.7*
Food Stamps	45.7	44.5	48.0*	47.8*
Medicaid	76.1	74.6	76.6	74.7
SSI	8.1	6.6	7.0*	7.0
WIC	88.6	85.5*	87.5	85.9
Public housing	10.6	8.4	9.5*	8.9
Has Inadequate Resources				
Food	4.6	7.1*	4.9	6.3
Housing	11.4	12.5	12.3	13.3
Money to buy necessities	19.5	19.7	20.8	21.7*
Medical care	13.8	15.1	14.0	14.7
Transportation	20.1	22.0	20.9	22.4
Child care	33.1	33.1	34.4	34.6
Money for supplies	24.5	30.9*	27.1*	29.4
Support from friends	11.9	11.2	12.9	14.0*
Parent information	13.1	15.9	12.5	16.3
Maternal Risk Index[f]				
0 or 1 (low risk)	21.2	19.3	19.0*	17.4
2 or 3 (moderate risk)	53.7	56.0	54.2	56.5
4 or 5 (high risk)	25.1	24.7	26.8	26.0
Random Assignment Date				
Before 10/96	34.9	35.2	36.0*	36.5
10/96 to 6/97	27.6	31.6	30.2	30.8
After 6/97	37.5	33.2	33.8	32.7
Previously Enrolled in Head Start or Another Childhood Development Program[e]	12.7	13.9	12.8	13.4
Characteristics of Focus Child				
Age (Months)				
Unborn	25.1	26.5	24.2	26.5
Less than 5	34.8	36.0	36.1	34.7
5 or more	40.2	37.5	39.7	38.7
Male	50.7	49.7	51.7	50.4
First Born	61.8	61.7	62.3	62.8
Birthweight Less than 2,500 Grams[e]	9.1	7.8	9.9	8.4
Born more than 3 Weeks Early[e]	13.5	11.6	15.8*	12.0

TABLE D.2D *(continued)*

Variable	Respondents		Respondents and Nonrespondents	
	Program Group	Control Group[a]	Program Group[b]	Control Group[c]
Stayed in Hospital After Birth[e]	16.7	16.6	18.3	16.0
People Concerned About the Child's Overall Health and Development[e]	12.0	14.6	13.0	13.3
Received an Evaluation Because of Concerns About the Child's Overall Health and Development or Because of Suspected Developmental Delay[e]	5.4	6.9	6.0	6.9
Risk Categories				
Has established risks[e]	11.2	9.9	11.6	10.6
Has biological or medical risks[e]	16.8	16.0	18.3	16.8
Has environmental risks[e]	30.6	36.0*	32.5	36.4
Covered by Health Insurance[e]	91.4	91.8	90.1*	89.6*
Sample Size	**874**	**784**	**1,513**	**1,488**

SOURCE: HSFIS application and enrollment forms and 36-month video assessment data.

[a]Significance levels are from tests comparing program and control group respondents.

[b]Significance levels are from tests comparing respondents and the full sample of respondents and nonrespondents in the program group.

[c]Significance levels are from tests comparing respondents and the full sample of respondents and nonrespondents in the control group.

[d]The primary caregiver is considered to be an adult regardless of her age.

[e]These variables pertain to families with focus children who were born at baseline.

[f]This index was constructed by summing the number of the following risk factors that the mother faced: (1) being a teenage mother; (2) having no high school credential; (3) receiving public assistance; (4) not being employed or in school or training, and (5) being a single mother.

*Significantly different from zero at the .10 level, two-tailed test.

education level of the primary caregiver. In addition, they were higher if the primary caregiver (1) was employed at the time of random assignment (for the program group), (2) was married or living with other adults, and (3) was receiving welfare. Response rates were also slightly higher for whites than for African Americans and Hispanics for some data sources, and for those randomly assigned later than earlier. The *p*-values to test the hypotheses that variable means and distributions are *jointly* similar are less than .01 for all data sources and for both research groups (Table D.2E). These results suggest that program group respondents are not fully representative of the full program group, and that control group respondents are not fully representative of the full control group.

However, we find fewer differences between the baseline characteristics of program and control group *respondents*. Very few of the differences in the distributions of the baseline variables for respondents in the two research groups are statistically significant. For example, the program and control group differences are statistically significant at the 10 percent level for only 6 of the 48 univariate tests for the 36-month Bayley assessment (which is close to the approximately 5 tests that would be expected by chance). Similarly, only 4 of the tests for the 36-month video assessment, 4 for the 36-month PI, and 5 for the 26-month PSI are statistically significant at the 10 percent level. Furthermore, *none* of the joint tests from the multivariate regression models is statistically significant at the 10 percent level (Table D.2E). Finally, very few univariate tests for key variables are rejected at the 10 percent level across the sites, and the significant test statistics are scattered across sites and variables (not shown).

In sum, we find some differences in the characteristics of respondents and nonrespondents, but these differences are not large and, in most instances, are similar for both the program and the control groups. Consequently, the characteristics of respondents in the two research groups are similar, which suggests that our impact estimates are likely to be unbiased.

TABLE D.2E

P-VALUES FROM JOINT TESTS COMPARING THE BASELINE CHARACTERISTICS OF INTERVIEW RESPONDENTS AND NONRESPONDENTS, BY DATA SOURCE
(Percentages)

Data Source	Respondents Versus the Full Sample of Respondents and Nonrespondents		Program Group Respondents Versus Control Group Respondents
	Program Group	Control Group	
Parent Service Interviews (PSIs)			
6-Month	.08*	<.01***	.82
15-Month	.03**	.03**	.50
26-Month	.03**	<.01***	.80
Parent Interviews (PIs)			
14-Month	<.01***	<.01***	.93
24-Month	<.01***	<.01***	.60
36-Month	<.01***	<.01***	.93
All three	<.01***	<.01***	.88
Bayley Assessments			
14-Month	<.01***	<.01***	.93
24-Month	<.01***	<.01***	.19
36-Month	<.01***	.07*	.79
All three	<.01***	<.01***	.76
Video Assessments			
14-Month	<.01***	<.01***	.93
24-Month	<.01***	<.01***	.37
36-Month	<.01***	.04**	.58
All three	<.01***	<.01***	.68

SOURCE: HSFIS application and enrollment forms.

*Statistically different from zero at the .10 level, two-tailed test.
**Statistically different from zero at the .05 level, two-tailed test.
***Statistically different from zero at the .01 level, two-tailed test.

2. Adjusting for the Effects of Nonresponse

As discussed in Chapter II of this report, the main approach we used to adjust for observed differences between program and control group respondents was to estimate program impacts using regression models. In these models, we regressed outcome variables on a program status indicator variable and a large number of explanatory variables. The explanatory variables were constructed using HSFIS data and pertain to the characteristics of families and children at baseline. An important criterion that we used to select the explanatory variables was that they should capture differences between the characteristics of respondents in the two research groups. Furthermore, to adjust for differences in response rates across sites, we assigned equal weight to each site in the analysis.

We believe that our regression approach produced unbiased estimated impacts because there were no large differences between respondents in the two research groups, and because the regression models controlled for some of these differences. However, the regression procedure does not correct for differences between respondents and nonrespondents in each research group; thus, the estimated impacts may not be generalizable to the full study population.

To address this problem, we constructed sample weights so that the weighted observable baseline characteristics of respondents were similar to the baseline characteristics of the full sample of respondents and nonrespondents. For each survey instrument, we constructed separate weights for program and control group members using the following three steps:

1. ***We estimated a logit model predicting interview response.*** The binary variable indicating whether or not a family was a respondent to the instrument was regressed on the full set of HSFIS variables used in the nonresponse analysis discussed above, as well as site indicator variables. Only HSFIS variables that were statistically

significant predictors of response status were retained as explanatory variables in the models.[2]

2. ***We calculated a propensity score for each family in the full sample.*** We constructed this score, the predicted probability that a family was a respondent, using the parameter estimates from the logit regression model and the family's HSFIS characteristics. Families with large propensity scores were likely to be respondents, whereas families with small propensity scores were likely to be nonrespondents.

3. ***We constructed nonresponse weights using the propensity scores.*** Families were ranked by the size of their propensity scores and were divided into six groups of equal size. The weight for a family was inversely proportional to the mean propensity score of the group the family was assigned to.[3]

This propensity score procedure yielded large weights for families with characteristics that were associated with low response rates (that is, for those with small propensity scores). Similarly, the procedure yielded small weights for families with characteristics that were associated with high response rates. Thus, the weighted characteristics of respondents were similar, on average, to the characteristics of the entire research sample.

As discussed in Chapter II, our main procedure was *not* to include these weights in the regression models when estimating impacts per eligible applicant and per participant. The use of these weights correctly adjusts for nonresponse bias when impacts are estimated with a simple differences-in-means estimation approach. However, using weights does not correctly adjust for nonresponse bias in a regression context, because the regression-adjusted impact estimates are not weighted correctly (DuMouchel and Duncan 1983).

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[2]We estimated the logit models using the full sample rather than by site, so that we could include many more HSFIS variables and obtain more precise parameter estimates.

[3]The nonresponse weight for a family could be defined to be inversely proportional to that family's actual propensity score. However, families were divided into six groups to "smooth" the weights. The theoretical properties of the smoothed weights can be shown to be superior to those of the unsmoothed weights.

To check the robustness of study findings, we did estimate the regression models using the sample weights (see Appendix D.4). In addition, we used weights when estimating impacts using a simple differences-in-means approach (see Appendix D.4). These differences-in-means impact estimates should be unbiased and generalizable to the study population (although they are less precise than the regression-adjusted impact estimates). We inflated the standard errors of the weighted impact estimates to account for design effects due to weighting.

It is important to note that the use of weights and regression models adjusts only for *observable* differences between survey respondents and nonrespondents in the two research groups. The procedure does not adjust for potential unobservable differences between the groups. Thus, our procedures only partially adjust for potential nonresponse bias.

D.3 ESTIMATING IMPACTS PER PARTICIPANT

The comparison of the average outcomes of all program and all control group members yields unbiased estimates of program impacts for eligible applicants, because random assignment was performed at the point that applicant families were determined to be eligible for Early Head Start services. In Chapter II, we described our methods for obtaining regression-adjusted impacts per eligible applicant. However, some eligible families in the program group decided not to participate in the program after random assignment. This appendix describes the procedures that we used to obtain unbiased impact estimates for those who actually received some services (that is, for program *participants*).[4]

We used a two-step procedure to estimate impacts per participant for both the global and the targeted analyses. First, for each site, we divided the regression-adjusted impacts per eligible applicant by the site's program group participation rate (Bloom 1984). Second, we averaged these site-specific impact estimates, giving equal weight to each site.

To illustrate how this procedure generates unbiased impact estimates for participants, we express the impact per eligible applicant on a given outcome in a site as a weighted average of the program impact for those eligible applicants who would participate in Early Head Start, given the chance, and the program impact for those who would not participate, with weights p_s and $(1-p_s)$, respectively. In mathematical terms:

$$(1)\ I_{Es} = p_s * I_{Ps} + (1 - p_s) * I_{Ns},$$

[4]Our definition of a program participant was discussed in Chapter II.

where I_{Es} is the impact per eligible applicant in site *s*, I_{Ps} is the impact per participant (that is, the difference between the average outcome of program and control group members who would participate in Early Head Start if given the chance), and I_{Ns} is the impact per nonparticipant (that is, the difference between the average outcome of program and control group members who would not participate if given the chance).

We do not know which control group families would have participated if they had instead been assigned to the program group, or which control group members would not have participated. However, this information is not necessary if we assume that all impacts were due to those who participated in Early Head Start, and that the *impacts on nonparticipants were zero* (that is, $I_{Ns} = 0$). Under this assumption (or "exclusion restriction"), the impact per participant in a site can be calculated by dividing the impact estimate per eligible applicant (that is, those based on *all* program and control group members) by the proportion of program group members who participated in Early Head Start. In mathematical terms:

$$(2)\ I_{Ps} = \frac{I_{Es}}{p_s}.$$

Our estimate of the impact per participant across all sites is the simple average of the site-specific impacts per participant (that is, the average of I_{Ps} over all sites). The standard errors of these impacts are larger than those for the impacts per eligible applicant, because the standard errors for the impacts per participant need to account for the estimation error in the site participation rates.

To make this procedure operational, we used PROC SYSLIN in the SAS statistical software package to estimate the following system of equations, using two-stage least-squares (instrumental variable) estimation techniques:

$$(3)\quad S_j * P = \delta_j S_j * T \ + \ u_j$$

$$(4) \quad y = \sum_j \alpha_j (S_j * P) \; + \; X\beta \; + \; \varepsilon,$$

where S_j is an indicator variable equal to 1 if the family is in site j, P is an indicator variable equal to 1 if the program group family participated in Early Head Start (and is 0 for control group families and program group nonparticipants), T is an indicator variable equal to 1 if the family is in the program group, y is an outcome variable, X are explanatory variables (that include site indicator variables), ε and the u_js are mean zero disturbance terms, and δ_j, α_j, and β are parameters to be estimated.

In the first-stage regressions, we obtained estimates of δ_j in equation (3) for each site j. These estimates were the program group participation rates in each site.[5] In the second-stage regression, we estimated equation (4) where the predicted values from the first-stage regressions were used in place of the S_j*P interaction terms. In this formulation, the estimate of α_j from the second-stage regression represents the impact estimate per participant in site j. The standard errors of these estimates were corrected for the estimation error from the first-stage regressions.[6]

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[5]We also estimated models that included other explanatory variables (that is, that included the X variables in equation [4]). These models did not change the results and so, for simplicity, were not adopted.

[6]This procedure uses the treatment status indicator variable (T) as an "instrument" for the program participation indicator variable (P) in each site. This is a valid instrument, because T is correlated with P but is uncorrelated with the disturbance term ε due to random assignment. The instrumental variable estimates of the impacts per participant are identical to the estimates using the Bloom procedure described above (Angrist et al. 1996).

D.4 ASSESSING THE ROBUSTNESS OF STUDY FINDINGS

As discussed in Chapter II, Early Head Start impacts on child, parent, and family outcomes were estimated (1) using regression models to control for baseline differences between the program and control groups; (2) giving equal weight to each site; (3) not using weights to adjust for nonresponse; and (4) using the maximum sample for each outcome variable (that is, using the full sample for whom the outcome variable could be constructed). This appendix addresses the following important question: Are the impact estimates sensitive to alternative estimation strategies, weighting schemes, or sample definitions?

To test the robustness of study findings, we also estimated global impacts under the following scenarios:

1. ***Using Simple Differences-in-Means Estimation Techniques.*** Our main estimation approach was to use regression models to estimate program impacts. However, we also estimated impacts by simply comparing the mean outcomes of the program and control groups, and used t-tests to gauge the statistical significance of the estimated impacts.

2. ***Using Weights to Adjust for Nonresponse.*** As discussed in Appendix D.2, we constructed weights to adjust for potential bias in the impact estimates due to interview nonresponse. The use of these weights correctly adjusts for nonresponse using the simple differences-in-means estimation methods. Although there is no theoretical reason to use these weights in a regression context, we did include them in some models to examine how the results would change.

3. ***Weighting Each Site by Its Sample Size.*** Our main approach was to weight each site equally in the analysis regardless of sample size, because the intervention varied substantially across programs and was administered at the site level. However, we also estimated models where sites with larger sample sizes (response rates) were given larger weights than sites with smaller sample sizes (response rates). For these models, we simply pooled all observations across all sites.

4. ***Using Alternative Sample Definitions.*** Our main approach was to estimate impacts using all sample members for whom outcome measures were available. However, we also estimated impacts using alternative sample definitions: those who (1) completed a particular instrument at all three data collection points (which is the sample that was used in the growth curve analysis); (2) completed the 26-month PSI *and* the particular 36-month birthday-related instrument (so that the impacts on service use and receipt could be directly linked to the impacts on the child, parent, and family outcomes); and (3) completed the 24-month PI and the particular 36-month birthday-related instrument (which is the sample that was used in the mediated analysis).

5. ***Dropping Sites with Low Response Rates.*** We estimated impacts after dropping sample members from three sites with the lowest response rates, because interview respondents in these sites may not be representative of the full samples or respondents and nonrespondents in these sites.

We estimated impacts on 28 key child, parenting, and family outcomes constructed using the 36-month birthday-related instruments and the 26-month PSIs.

Our results indicate that our main global impact findings are very robust to alternative estimation strategies, weighting schemes, and sample definitions (Tables D.4A and D.4B). The regression results are very similar whether or not we use nonresponse weights and whether we weight sites equally or by their sample sizes. Interestingly, the differences-in-means estimates are very similar to the regression ones, because as discussed, the baseline characteristics of interview respondents in the two research groups are similar. The same set of policy conclusions can be drawn using impact results from the alternative sample definitions. Finally, the results do not change substantially when we drop the three sites with the lowest response rates.

In sum, we believe that our impact findings represent real effects and are not due to our methodological assumptions.

TABLE D.4A

IMPACT ESTIMATES PER PARTICIPANT FOR THE FULL SAMPLE ON KEY 36-MONTH OUTCOME VARIABLES USING ALTERNATIVE ESTIMATION AND WEIGHTING STRATEGIES

	Regression-Adjusted Estimates			Differences-in-Means Estimates		
Variable	Sites Weighted Equally, No Weights for Nonresponse (Benchmark)	Sites Weighted Equally, Weights for Nonresponse	Sites Weighted by Sample Size, Weights for Nonresponse	Sites Weighted Equally, No Weights for Nonresponse	Sites Weighted Equally, Weights for Nonresponse	Sites Weighted by Sample Size, Weights for Nonresponse
Bayley Mental Development Index (MDI) Standard Score	1.55**	1.50**	1.54**	1.36**	1.49**	1.40**
Percentage with MDI <85	-4.69*	-4.33*	-3.55	-4.27*	-3.65	-4.18*
PSI: Parental Distress	-0.73	-0.77	-0.64	-0.68	-0.64	-0.70
Center for Epidemiologic Studies Depression Scale (CES-D) Total Score	-0.26	-0.20	-0.08	-0.24	-0.07	-0.11
Percentage of Parents Who Spanked the Child in the Previous Week	-7.09***	-6.92***	-7.12***	-6.94***	-6.67***	-6.42***
Index of Severity of Discipline Strategies	-0.18**	-0.16**	-0.17**	-0.16**	-0.16**	-0.14*
Percentage of Parents Who Read to Their Child Every Day	4.85**	4.59*	4.46*	4.22*	4.37*	4.37*
Percentage of Parents Suggesting Only Mild Responses to Hypothetical Situations	-0.18**	-0.16**	-0.17**	-0.16**	-0.16**	-0.14**
Home Observation for Measurement of the Environment (HOME): Total Score	0.53**	0.55**	0.58**	0.60**	0.59**	0.57**

TABLE D.4A *(continued)*

Variable	Regression-Adjusted Estimates			Differences-in-Means Estimates		
	Sites Weighted Equally, No Weights for Nonresponse (Benchmark)	Sites Weighted Equally, Weights for Nonresponse	Sites Weighted by Sample Size, Weights for Nonresponse	Sites Weighted Equally, No Weights for Nonresponse	Sites Weighted Equally, Weights for Nonresponse	Sites Weighted by Sample Size, Weights for Nonresponse
HOME: Support of Language and Learning	0.21**	0.22**	0.26***	0.25**	0.28***	0.26**
HOME: Warmth	0.08*	0.09**	0.08**	0.08*	0.08*	0.09**
Parent Supportiveness (Semistructured Play)	0.14***	0.13***	0.12**	0.12**	0.12**	0.12**
Parent Intrusiveness (Semistructured Play)	-0.04	-0.04	-0.04	-0.03	-0.05	-0.04
Parent Detachment (Semistructured Play)	-0.06*	-0.06*	-0.05	-0.05	-0.05	-0.05
Parent Engagement (Semistructured Play)	0.21***	0.21***	0.19***	0.19***	0.19***	0.19***
Sustained Attention with Objects (Semistructured Play)	0.16***	0.15***	0.16***	0.15***	0.16***	0.15***
Negativity Toward Parent (Semistructured Play)	-0.08**	-0.08**	-0.07**	-0.07**	-0.07**	-0.07**
Persistence (Puzzle Challenge Task)	0.07	0.05	0.07	0.05	0.06	0.04
Child Behavior Checklist: Aggressive Behavior	-0.69**	-0.65*	-0.52	-0.55	-0.44	-0.53
Peabody Picture Vocabulary Test (PPVT-III) Standard Score	2.13**	1.97**	1.65*	2.08**	1.52*	1.96**
Percentage with PPVT <85	-6.02**	-6.05**	-5.86**	-5.22*	-5.25*	-5.24*
Percentage of Caregivers Ever Employed During the 26 Months After Random Assignment	3.38*	3.24*	2.96*	3.93**	3.29*	3.70**

TABLE D.4A *(continued)*

Variable	Regression-Adjusted Estimates			Differences-in-Means Estimates		
	Sites Weighted Equally, No Weights for Nonresponse (Benchmark)	Sites Weighted Equally, Weights for Nonresponse	Sites Weighted by Sample Size, Weights for Nonresponse	Sites Weighted Equally, No Weights for Nonresponse	Sites Weighted Equally, Weights for Nonresponse	Sites Weighted by Sample Size, Weights for Nonresponse
Percentage of Caregivers Ever in an Education or Training Program During the 26 Months After Random Assignment	8.61***	8.85***	8.92***	9.37***	9.73***	10.01***
Average Parent-Reported Health Status of Child	-0.02	-0.02	-0.01	-0.01	0.00	-0.00
Continuous Biological Father Presence Child Age 14 to 36 Months	-0.68	-0.39	-1.58	-1.80	-3.01	-1.55
Continuous Male Presence Child Age 14 to 36 Months	-3.26	-2.81	-4.06**	-4.25**	-4.93**	-3.98*

SOURCE: PSI and PI data and Bayley and video assessments.

*Significantly different than zero at the .10 level, two-tailed test
**Significantly different than zero at the .05 level, two-tailed test
***Significantly different than zero at the .01 level, two-tailed test

TABLE D.4B

IMPACT ESTIMATES PER PARTICIPANT FOR THE FULL SAMPLE ON KEY 36-MONTH OUTCOME VARIABLES USING ALTERNATIVE SAMPLE DEFINITIONS

Variable	Completed the Relevant 36-Month or 26-Month Instrument (Benchmark)	Completed the Relevant Instrument at All Three Data Collection Points (Growth Curve Analysis Sample)	Completed the 26-Month PSI as well as the Relevant Instrument	Completed the 36-Month PI as well as the Relevant Instrument (Mediated Analysis Sample)	Completed the Relevant Interview and Dropped 3 Sites with the Lowest Response Rates
Bayley Mental Development Index (MDI) Standard Score	1.55**	1.67**	1.69**	1.99***	1.34*
Percentage with MDI <85	-4.69*	-8.45***	-5.96**	-6.02**	-3.52
PSI: Parental Distress	-0.73	-1.23**	-0.84	-1.15**	-0.77
Center for Epidemiologic Studies Depression Scale (CES-D) Total Score	-0.26	-0.20	-0.48	-0.36	-0.52
Percentage of Parents Who Spanked the Child in the Previous Week	-7.09***	-8.20***	-7.44***	-7.83***	-8.93***
Index of Severity of Discipline Strategies	-0.18**	-0.17**	-0.16**	-0.18**	-0.23***
Percentage of Parents Suggesting Only Mild Responses to Hypothetical Situations	4.19*	4.09*	3.69	4.35*	5.92**
Percentage of Parents Who Read to Their Child Every Day	4.85**	6.67**	5.08*	6.20**	4.98*
Home Observation for Measurement of the Environment (HOME): Total Score	0.53**	0.75***	0.67***	0.75***	0.41*

TABLE D.4.B *(continued)*

Variable	Completed the Relevant 36-Month or 26-Month Instrument (Benchmark)	Completed the Relevant Instrument at All Three Data Collection Points (Growth Curve Analysis Sample)	Completed the 26-Month PSI as well as the Relevant Instrument	Completed the 36-Month PI as well as the Relevant Instrument (Mediated Analysis Sample)	Completed the Relevant Interview and Dropped 3 Sites with the Lowest Response Rates
HOME: Support of Language and Learning	0.21**	0.28***	0.27***	0.31***	0.13
HOME: Warmth	0.08*	0.07	0.09**	0.07*	0.07
Parent Supportiveness (Semistructured Play)	0.14***	0.20***	0.12**	0.19***	0.11**
Parent Intrusiveness (Semistructured Play)	-0.04	0.00	-0.04	-0.06	0.00
Parent Detachment (Semistructured Play)	-0.06*	-0.08*	-0.04	-0.08**	-0.03
Parent Engagement (Semistructured Play)	0.21***	0.20***	0.21***	0.27***	0.16**
Sustained Attention with Objects (Semistructured Play)	0.16***	0.12*	0.15***	0.21***	0.10*
Negativity Toward Parent (Semistructured Play)	-0.08**	-0.06	-0.11***	-0.10***	-0.08**
Persistence (Puzzle Challenge Task)	0.07	-0.00	0.05	0.12*	-0.05
Child Behavior Checklist: Aggressive Behavior	-0.69**	-0.61*	-0.74**	-0.66*	-0.87**
Peabody Picture Vocabulary Test (PPVT-III) Standard Score	2.13**	2.78***	2.21**	2.77***	2.39**
Percentage with PPVT <85	-6.02**	-8.63***	-5.26*	-9.27***	-5.52*

TABLE D.4.B *(continued)*

Variable	Completed the Relevant 36-Month or 26-Month Instrument (Benchmark)	Completed the Relevant Instrument at All Three Data Collection Points (Growth Curve Analysis Sample)	Completed the 26-Month PSI as well as the Relevant Instrument	Completed the 36-Month PI as well as the Relevant Instrument (Mediated Analysis Sample)	Completed the Relevant Interview and Dropped 3 Sites with the Lowest Response Rates
Percentage of Caregivers Ever Employed During the 26 Months After Random Assignment	3.38*	2.77	3.38*	3.38*	2.63
Percentage of Caregivers Ever in an Education or Training Program During the 26 Months After Random Assignment	8.61***	9.22***	8.61***	8.61***	7.36***
Average Parent-Reported Health Status of Child	-0.02	-0.01	-0.01	-0.00	0.00
Continuous Biological Father Presence Child Age 14 to 36 Months	-0.68	-0.68	0.83	-0.68	-0.30
Continuous Male Presence Child Age 14 to 36 Months	-3.26	-3.26	-1.72	-3.26	-3.72

SOURCE: PSI and PI data and Bayley and video assessments.

NOTE: All estimates were calculated using regression models where each site was weighted equally and where weights for nonresponse were not used.

*Significantly different than zero at the .10 level, two-tailed test
**Significantly different than zero at the .05 level, two-tailed test
***Significantly different than zero at the .01 level, two-tailed test

D.5 RESULTS FROM THE GROWTH CURVE ANALYSIS

As discussed in Chapter II, in addition to our basic point-in-time analysis, we used longitudinal statistical methods (or, more specifically, growth curve or hierarchical linear modeling) to estimate the effects of Early Head Start participation on child and family outcomes that were measured when the focus children were, on average, 15, 25, and 37 months old. These methods were used to examine impacts (program and control group differences) on the growth trajectories of child and family outcomes during the follow-up period.

In our context, the growth curve approach can be considered a two-stage process. First, a regression line is fit through the three data points for *each* program and control group member, and second, impacts are obtained on these estimated intercepts and slopes. For each outcome measure, the growth curve approach produces an overall regression line for the program group (defined by the mean estimated intercept and mean estimated slope across all program group members) and, similarly, an overall regression line for the control group. The difference between these overall regression lines at any given time point yields a point-in-time impact estimate.[7]

The sample for the growth curve analysis included only those sample members who completed interviews and assessments at every time point. The sample for the basic point-in-time analysis, however, used all available data at each time point.[8]

Several criteria were used to select the child and family outcomes for the growth curve analysis. First, we only selected outcomes that were measured at *each* birthday-related interview

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[7]As discussed in Chapter II, the growth curve models were estimated in one stage rather than two, for efficiency reasons.

[8]Another difference between the two approaches is that, because of analytic complications, sites were weighted by their sample sizes using the growth curve approach (that is, observations across sites were pooled), whereas sites were weighted equally using the basic point-in-time

or assessment. Second, we selected outcomes that are continuous variables. We excluded binary and categorical variables, because it is difficult to interpret growth for these variables at the individual level. Finally, we excluded outcomes that were age-normed (for example, the Bayley MDI). Eleven outcome variables met the criteria for inclusion in the growth curve analyses.

Tables D.5A and D.5B display results from the growth curve analysis. Table D.5A displays the estimated intercepts and slopes (growth rates) for program and control group members, as well as impacts on these intercepts and slopes. The parameters of the growth curve models were scaled so that the estimated intercepts represent average outcomes when the focus children were 15 months old. Hence, the estimated slopes represent the extent to which the outcomes changed per month between the time the focus children were 15 and 37 months old.

Table D.5B displays differences between the fitted lines for the program and control groups (that is, impacts on the outcomes) evaluated at the 15-, 25-, and 37-month points. The table also displays the corresponding impact estimates obtained using the basic point-in-time approach. As expected (see Chapter II), the two sets of impacts are generally similar (and especially so for the 37-month outcomes). Thus, as discussed in Chapter V of Volume I, the two approaches yield the same policy conclusions about the effects of Early Head Start on key child and family outcomes.

In Figures D.5A through D.5K, we display the changes over time in the variables documented in the tables. In Chapter V of Volume I, we discuss these findings in the context of the other impact analyses.

(continued)

approach. However, as shown in the sensitivity analysis in Appendix D.4, the impact results using the basic point-in-time approach are very similar using the two weighting schemes.

TABLE D.5A

ESTIMATED INTERCEPTS AND SLOPES FOR CHILD AND FAMILY OUTCOMES FROM THE GROWTH CURVE MODELS, BY RESEARCH STATUS

	Estimated Intercept: Average Outcome at 15 Months			Estimated Slope: Growth Between 15 and 37 Months		
Variable	Program Group	Control Group	Impact Per Eligible Applicant	Program Group	Control Group	Impact Per Eligible Applicant
Child Engagement (Semistructured Play)	3.927	3.835	0.092	0.0399	0.0347	0.0026
Child Negativity Toward Parent (Semistructured Play)	2.089	2.115	-0.026	-0.0381	-0.0358	-0.0023
Child Sustained Attention with Objects (Semistructured Play)	5.025	4.946	0.080	-0.0016	-0.0044	0.0028
Parental Supportiveness (Semistructured Play)	4.065	3.976	0.089*	-0.0015	-0.0022	0.0007
Parent-Child Activities (HOME)	4.506	4.504	0.001	-0.0023	-0.0049	0.0027
Parent Detachment (Semistructured Play)	1.534	1.625	-0.091**	-0.0142	-0.0168	0.0026
Parent Intrusiveness (Semistructured Play)	2.365	2.430	-0.065	-0.0397	-0.0409	0.0012
Negative Regard	1.474	1.455	0.018	-0.0077	-0.0065	-0.0012
PSI: Parental Distress	26.432	27.263	-0.831*	-0.0907	-0.0865	-0.0041
PSI: Parent-Child Dysfunctional Interaction	17.165	17.466	-0.301	0.0095	0.0060	0.0035
Family Conflict Scale (FES)	1.745	1.704	0.040	-0.0036	-0.0007	-0.0029*
Sample Size[e]						
Parent Interview	**898**	**802**	**1,700**	**898**	**802**	**1,700**
Bayley	**559**	**485**	**1,044**	**559**	**485**	**1,044**
Video	**617**	**551**	**1,168**	**617**	**551**	**1,168**

SOURCE: Parent interview and child assessments.

NOTE: All estimates were calculated using growth curve models. Generalized least squares techniques were used to estimate the regression models where the explanatory variables included a treatment status indicator variable, a variable signifying the age of the child at the interview or assessment relative to 15 months, a term formed by interacting child's age and the treatment status indicator variable, and other explanatory variables from the HSFIS data.

TABLE D.5A *(continued)*

[a] The analysis sample for each outcome includes those with available outcome data at all three time points.

*Significantly different from zero at the .10 level, two-tailed test
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.5B

ESTIMATED IMPACTS PER ELIGIBLE APPLICANT ON KEY OUTCOMES AT 15, 25, AND 37 MONTHS USING THE POINT-IN-TIME AND GROWTH CURVE ESTIMATION METHODS

	Impact at 15 Months		Impact at 24 Months		Impact at 36 Months	
Variable	Point-In-Time Method	Growth Curve Method	Point-In-Time Method	Growth Curve Method	Point-In-Time Method	Growth Curve Method
Child Engagement (Semistructured Play)	.079	.092	.098*	.118***	.185***	.148**
Child Negativity Toward Parent (Semistructured Play)	-.110**	-.026	-.067	-.049	-.073**	-.076
Child Sustained Attention with Objects (Semistructured Play)	.095**	.080	.062	.108***	.138***	.142***
Parent Supportiveness (Semistructured Play)	.132***	.089*	.093*	.096**	.117***	.105*
Parent-Child Activities (HOME)	.010	.001	.079**	.028	.062	.060
Parent Detachment (Semistructured Play)	-.096**	-.091**	-.091**	-.064*	-.054*	-.033
Parent Intrusiveness (Semistructured Play)	-.061	-.065	-.044	-.053	-.040	-.038
Negativity Toward Parent (Semistructured Play)	-.029	.018	.008	.006	-.009	-.009
PSI: Parental Distress	-.481	-.831*	-1.049**	-.872**	-.670	-.922**
PSI: Parent-Child Dysfunctional Interaction	-.216	-.301	-.449*	-.266	.026	-.224
Family Conflict Scale (FES)	.006	.040	-.053**	.012	-.022	-.023
Sample Size[a]						
Parent Interview	**898**	**802**	**1,700**	**898**	**802**	**1,700**
Bayley	**559**	**485**	**1,044**	**559**	**485**	**1,044**
Video	**617**	**551**	**1,168**	**617**	**551**	**1,168**

SOURCE: Parent interview and child assessments.

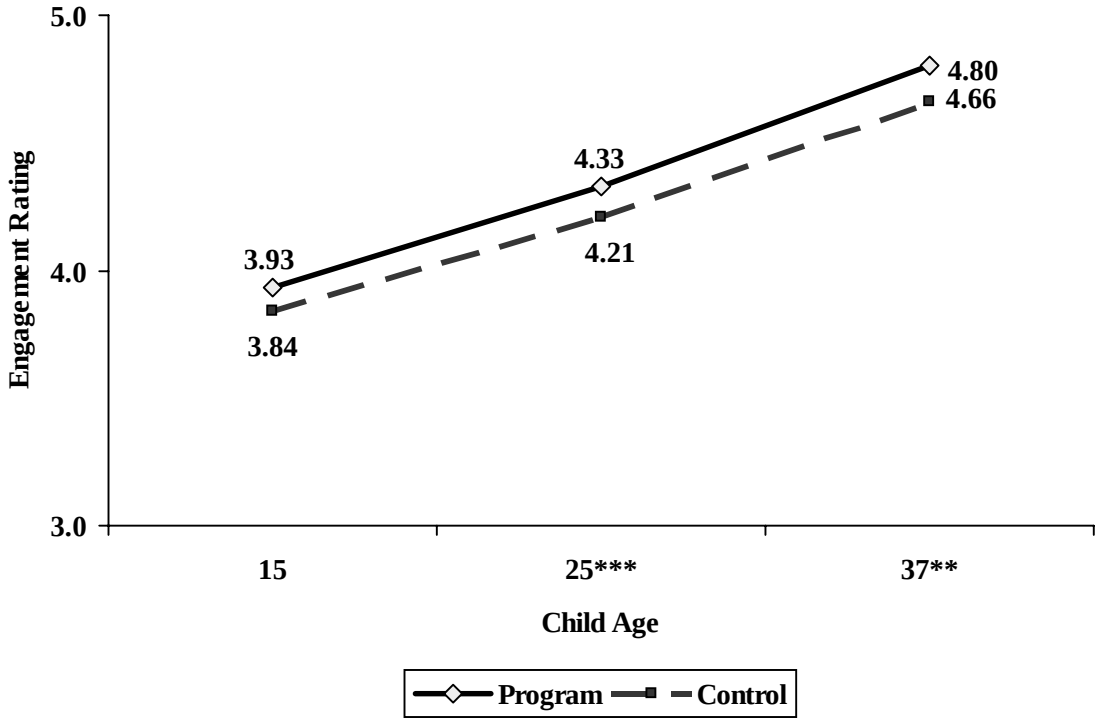
NOTE: All estimates were calculated using growth curve models. Generalized least squares techniques were used to estimate the regression models where the explanatory variables included a treatment status indicator variable, a variable signifying the age of the child at the interview or assessment relative to 15 months, a term formed by interacting child's age and the treatment status indicator variable, and other explanatory variables from the HSFIS data.

[a] The analysis sample for each outcome includes those with available outcome data at all three time points.

*Significantly different from zero at the .10 level, two-tailed test
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

FIGURE D.5A

GROWTH CURVES FOR CHILD ENGAGEMENT WITH PARENT IN SEMISTRUCTURED PLAY



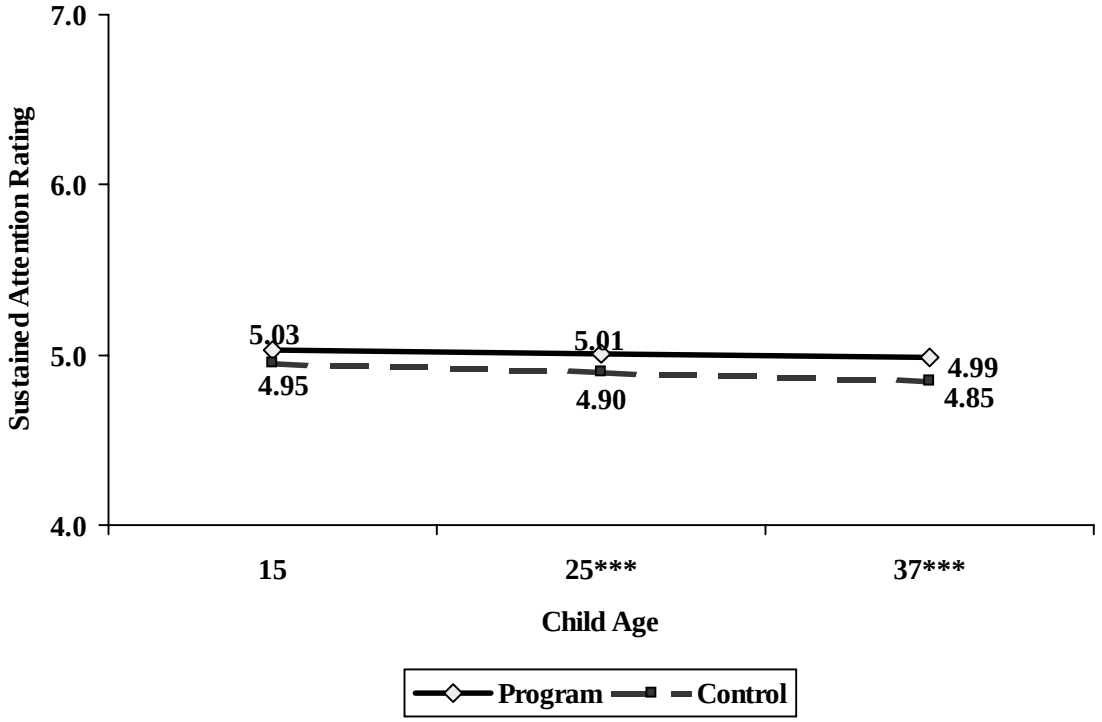
Source: Assessments of children's behavior during parent-child interactions in semistructured play conducted when children were approximately 15, 25, and 37 months old. The variable is coded on a scale of 1 to 7 (see Box V.2 and Appendix C).

Note: The growth curve analysis differs from the other impact analyses in several respects. The sample includes only those children and parents for whom we completed the assessments at all three ages. In addition, due to analytic complications, the growth curve analysis pooled the observations across sites rather than weighting by sites as was done for the point-in-time regression adjusted impact analyses. Appendix D.5 includes details on the sample sizes, estimated intercepts and slopes (growth rates) for each group, and the impacts on each. Hierarchical linear modeling produced the regression lines for the program and control groups. Asterisks indicate the significance of the difference between the regression lines at 15, 25, and 37 months:

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

FIGURE D.5B

GROWTH CURVES FOR CHILD SUSTAINED ATTENTION WITH OBJECTS IN SEMISTRUCTURED PLAY



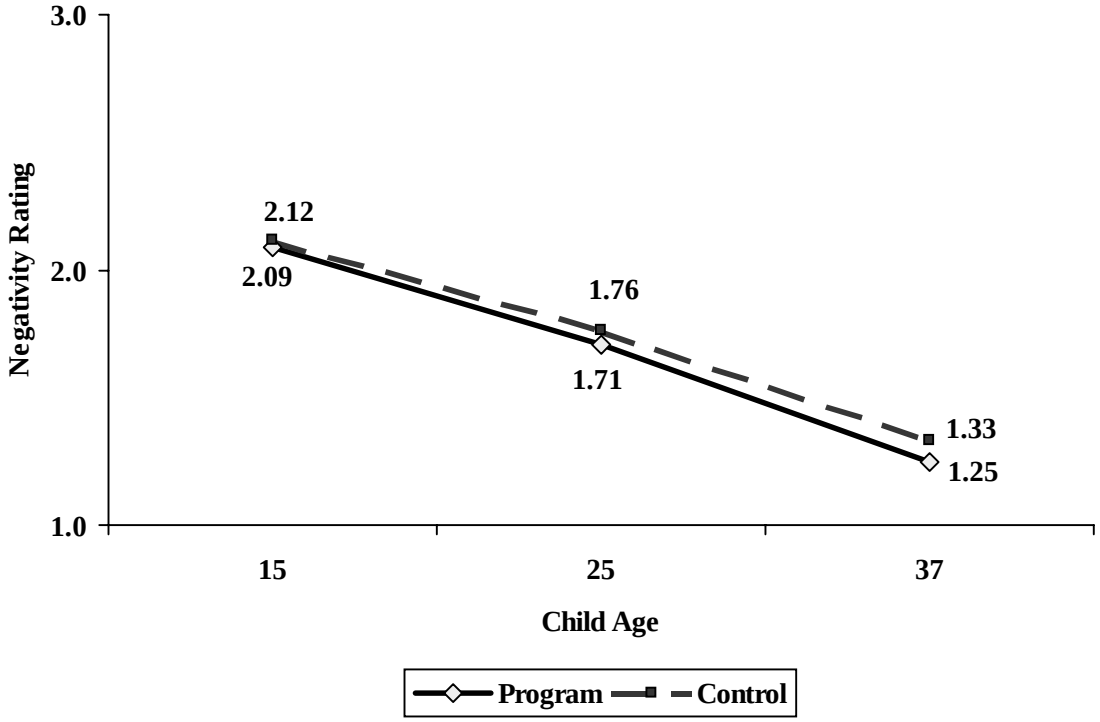
Source: Assessments of children's behavior during parent-child interactions in semistructured play conducted when children were approximately 15, 25, and 37 months old. The variable is coded on a scale of 1 to 7 (see Box V.3 and Appendix C).

Note: The growth curve analysis differs from the other impact analyses in several respects. The sample includes only those children and parents for whom we completed the assessments at all three ages. In addition, due to analytic complications, the growth curve analysis pooled the observations across sites rather than weighting by sites as was done for the point-in-time regression adjusted impact analyses. Appendix D.5 includes details on the sample sizes, estimated intercepts and slopes (growth rates) for each group, and the impacts on each. Hierarchical linear modeling produced the regression lines for the program and control groups. Asterisks indicate the significance of the difference between the regression lines at 15, 25, and 37 months:

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

FIGURE D.5C

GROWTH CURVES FOR CHILD NEGATIVITY TOWARD PARENT IN SEMISTRUCTURED PLAY

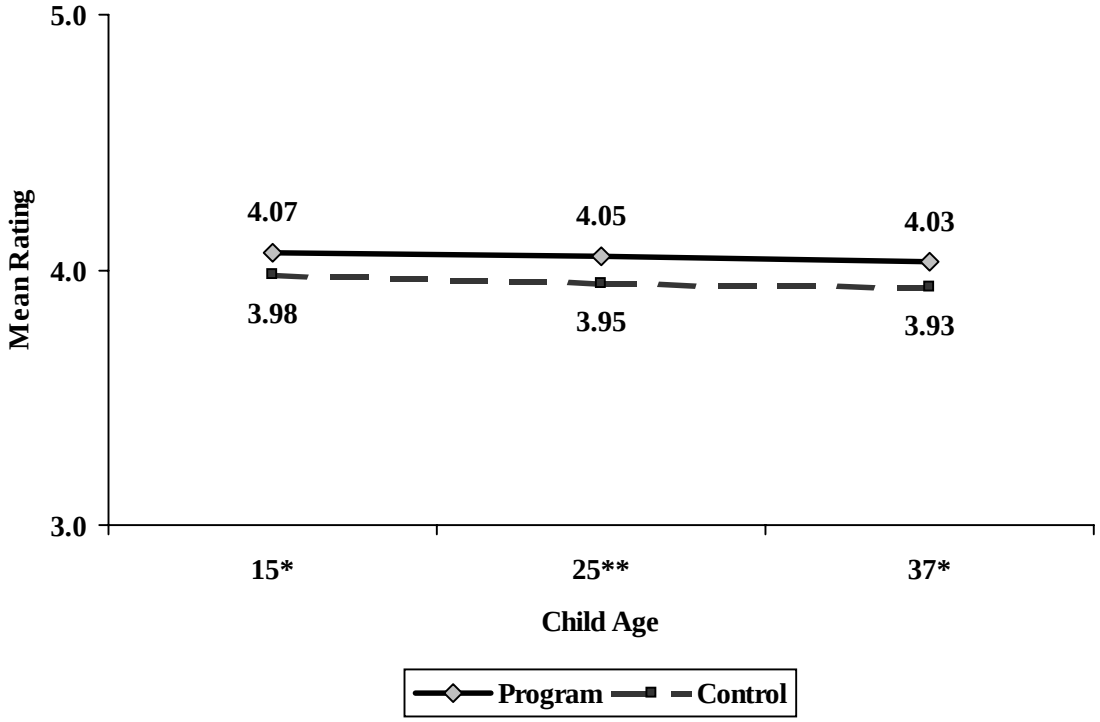


Source: Assessments of children's behavior during parent-child interactions in semistructured play conducted when children were approximately 15, 25, and 37 months old. The variable is coded on a scale of 1 to 7 (see Box V.2 and Appendix C).

Note: The growth curve analysis differs from the other impact analyses in several respects. The sample includes only those children and parents for whom we completed the assessments at all three ages. In addition, due to analytic complications, the growth curve analysis pooled the observations across sites rather than weighting by sites as was done for the point-in-time regression adjusted impact analyses. Appendix D.5 includes details on the sample sizes, estimated intercepts and slopes (growth rates) for each group, and the impacts on each. Hierarchical linear modeling produced the regression lines for the program and control groups. Asterisks indicate the significance of the difference between the regression lines at 15, 25, and 37 months.

FIGURE D.5D

PARENT SUPPORTIVENESS DURING SEMISTRUCTURED PLAY



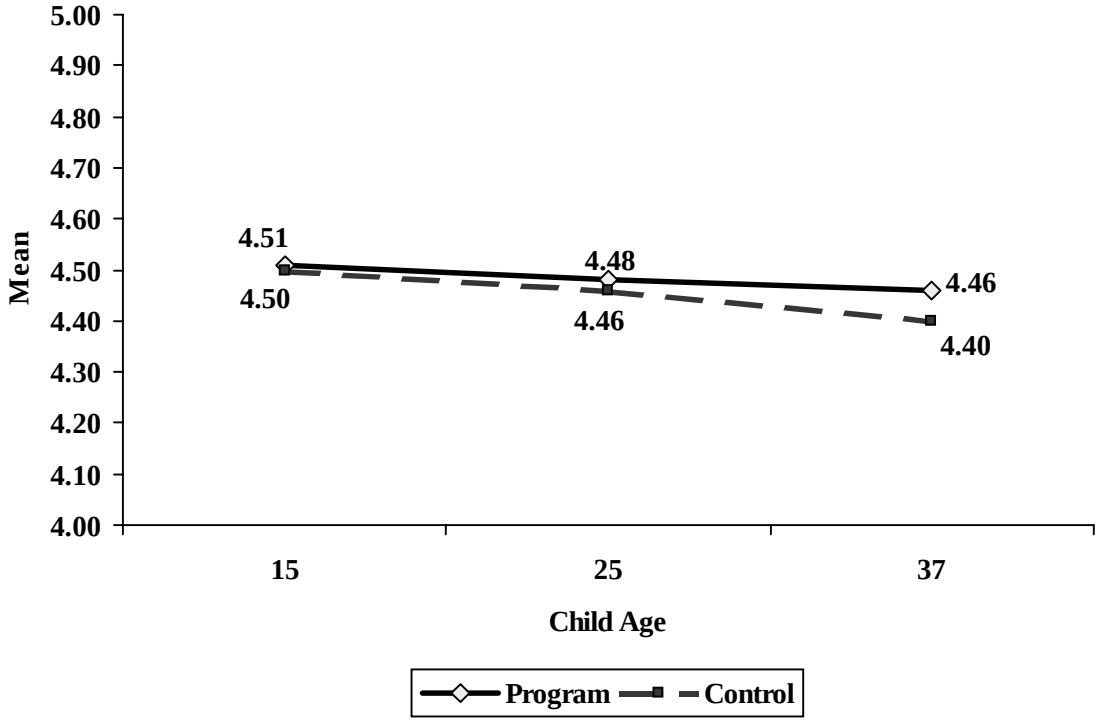
Source: Assessments of parents' behavior during parent-child interactions in semistructured play conducted when children were approximately 15, 25, and 37 months old. The variable is coded on a scale of 1 to 7 (see Box V.4 and Appendix C).

Note: The growth curve analysis differs from the other impact analyses in several respects. The sample includes only those children and parents for whom we completed the assessments at all three ages. In addition, due to analytic complications, the growth curve analysis pooled the observations across sites rather than weighting by sites as was done for the point-in-time regression adjusted impact analyses. Appendix D.5 includes details on the sample sizes, estimated intercepts and slopes (growth rates) for each group, and the impacts on each. Hierarchical linear modeling produced the regression lines for the program and control groups. Asterisks indicate the significance of the difference between the regression lines at 15, 25, and 37 months:

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

FIGURE D.5E

PARENT-CHILD PLAY ACTIVITIES

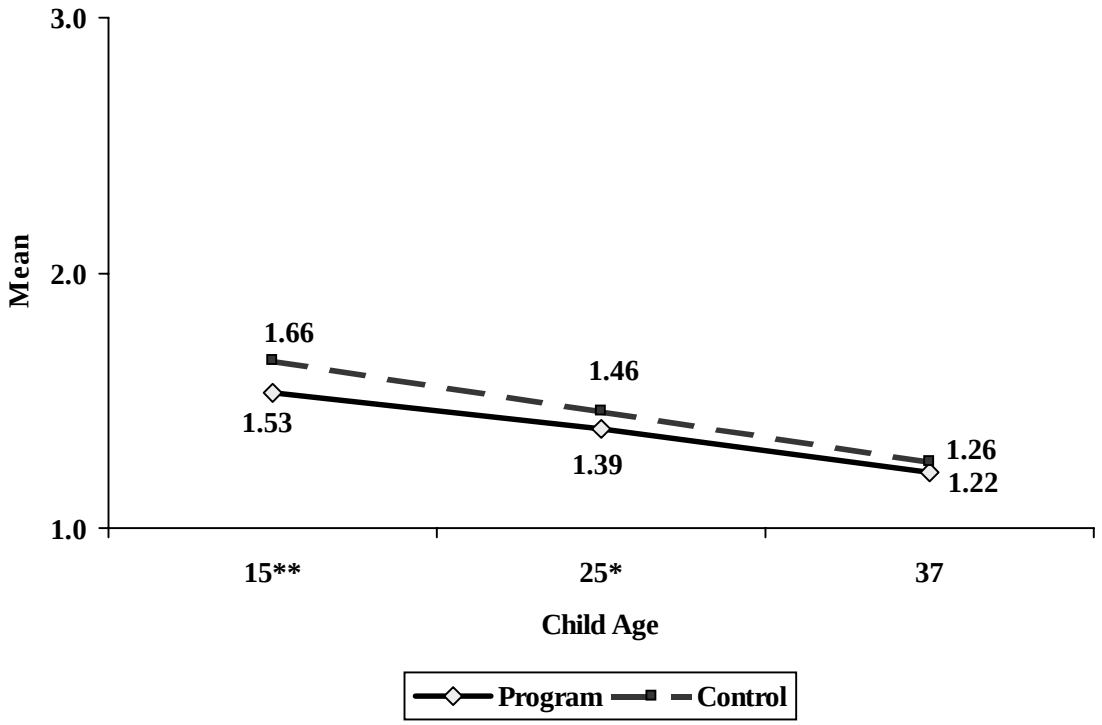


Source: Parent interviews conducted when children were approximately 15, 25, and 37 months old. Scores on the HOME parent-child activities scale can range from 1 to 6 (see Box V.5 and Appendix C).

Note: The growth curve analysis differs from the other impact analyses in several respects. The sample includes only those children and parents for whom we completed the assessments at all three ages. In addition, due to analytic complications, the growth curve analysis pooled the observations across sites rather than weighting by sites as was done for the point-in-time regression adjusted impact analyses. Appendix D.5 includes details on the sample sizes, estimated intercepts and slopes (growth rates) for each group, and the impacts on each. Hierarchical linear modeling produced the regression lines for the program and control groups. Asterisks indicate the significance of the difference between the regression lines at 15, 25, and 37 months.

FIGURE D.5F

PARENT DETACHMENT DURING SEMISTRUCTURED PLAY[a]



Source: Assessments of parent-child interactions in semistructured play conducted when children were approximately 15, 25, and 37 months old. The variable is coded on a scale of 1 to 7 (see Box V.6 and Appendix C).

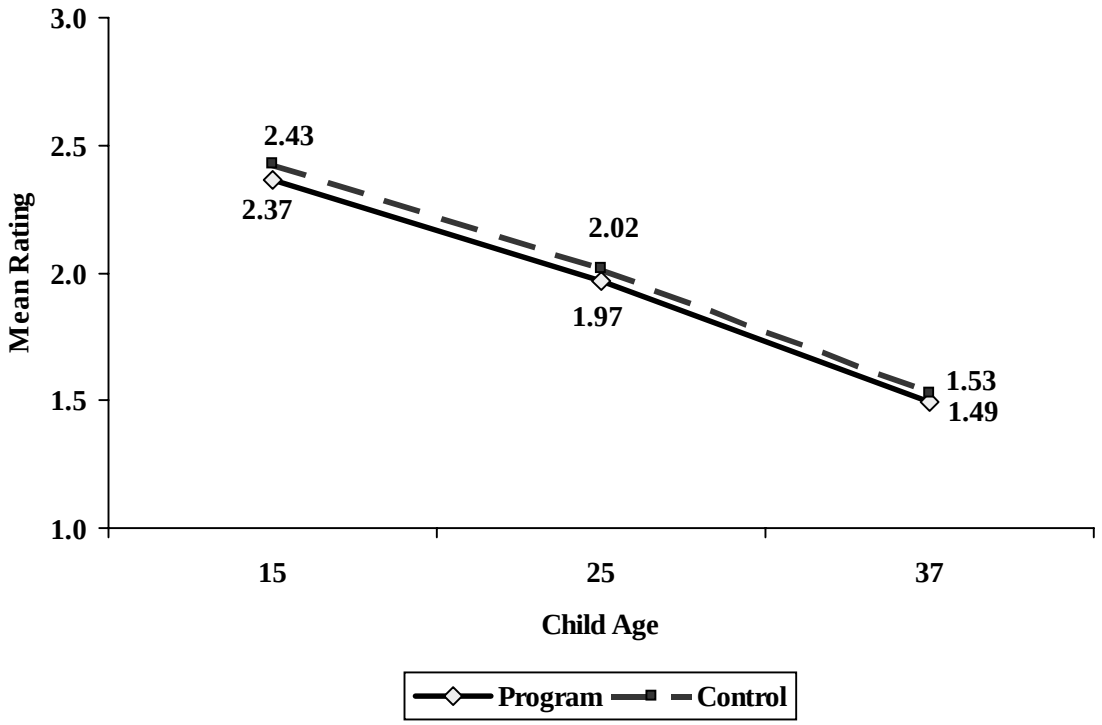
Note: The growth curve analysis differs from the other impact analyses in several respects. The sample includes only those children and parents for whom we completed the assessments at all three ages. In addition, due to analytic complications, the growth curve analysis pooled the observations across sites rather than weighting by sites as was done for the point-in-time regression adjusted impact analyses. Appendix D.5 includes details on the sample sizes, estimated intercepts and slopes (growth rates) for each group, and the impacts on each. Hierarchical linear modeling produced the regression lines for the program and control groups. Asterisks indicate the significance of the difference between the regression lines at 15, 25, and 37 months:

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

[a]Impact on the slope of the curves is statistically significant at $p<.05$, that is, the slope for the program group declines at a steeper rate than does the control group's.

FIGURE D.5G

PARENT INTRUSIVENESS DURING SEMISTRUCTURED PLAY



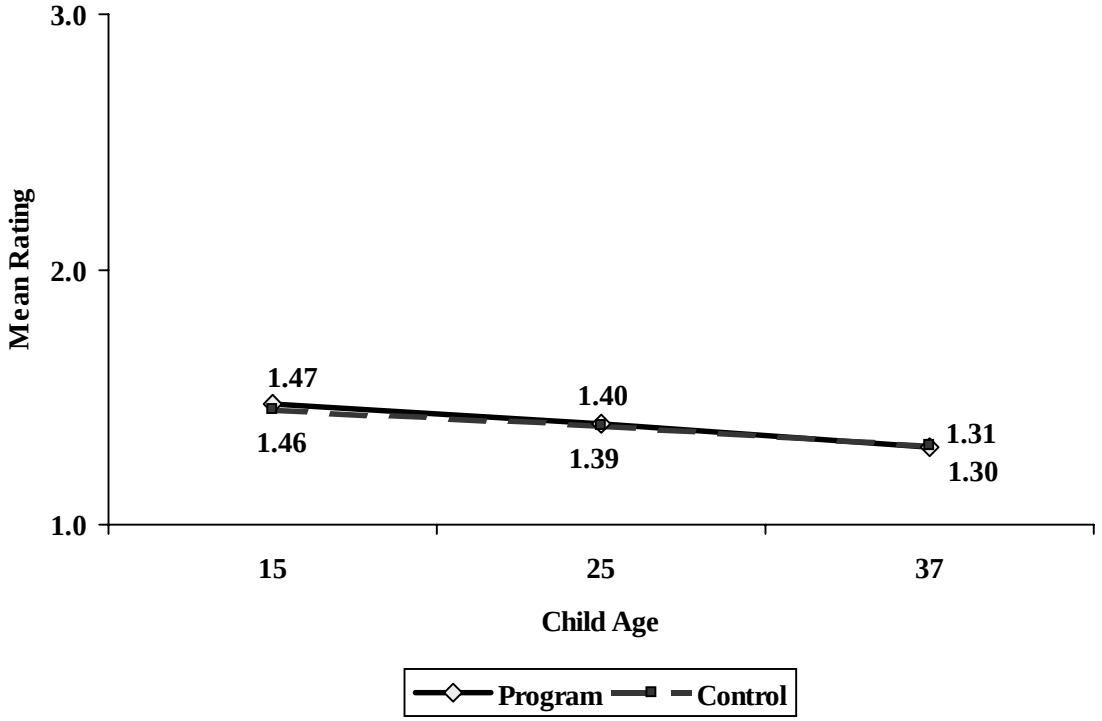
Source: Assessments of parents' behavior during parent-child interactions in semistructured play conducted when children were approximately 15, 25, and 37 months old. The variable is coded on a scale of 1 to 7 (see Box V.6 and Appendix C).

Note: The growth curve analysis differs from the other impact analyses in several respects. The sample includes only those children and parents for whom we completed the assessments at all three ages. In addition, due to analytic complications, the growth curve analysis pooled the observations across sites rather than weighting by sites as was done for the point-in-time regression adjusted impact analyses. Appendix D.5 includes details on the sample sizes, estimated intercepts and slopes (growth rates) for each group, and the impacts on each. Hierarchical linear modeling produced the regression lines for the program and control groups. Asterisks indicate the significance of the difference between the regression lines at 15, 25, and 37 months:

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

FIGURE D.5H

PARENT NEGATIVE REGARD DURING SEMISTRUCTURED PLAY

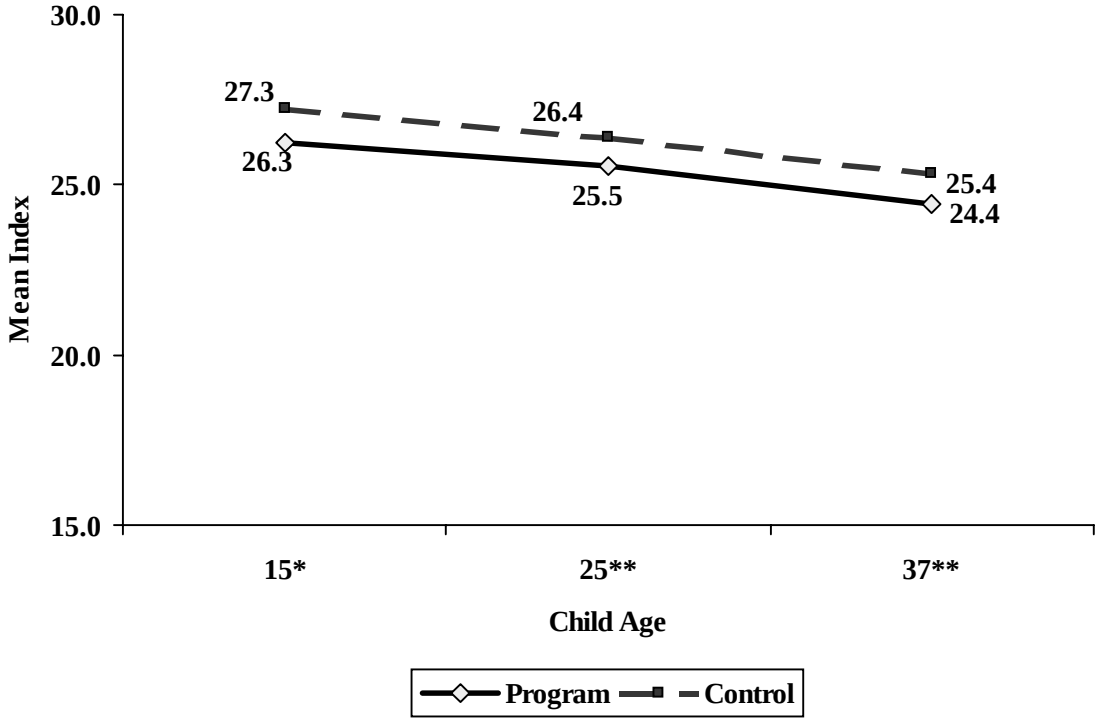


Source: Assessments of parents' behavior during parent-child interactions in semistructured play conducted when children were approximately 15, 25, and 37 months old. The variable is coded on a scale of 1 to 7 (see Box V.6 and Appendix C).

Note: The growth curve analysis differs from the other impact analyses in several respects. The sample includes only those children and parents for whom we completed the assessments at all three ages. In addition, due to analytic complications, the growth curve analysis pooled the observations across sites rather than weighting by sites as was done for the point-in-time regression adjusted impact analyses. Appendix D.5 includes details on the sample sizes, estimated intercepts and slopes (growth rates) for each group, and the impacts on each. Hierarchical linear modeling produced the regression lines for the program and control groups. Asterisks indicate the significance of the difference between the regression lines at 15, 25, and 37 months.

FIGURE D.5I

PARENT DISTRESS (PSI)[a]



Source: Parent interview conducted when children were approximately 15, 25, and 37 months old. The 12-item scale yields scores that can range from 12 to 60 (see Box V.8 and Appendix C).

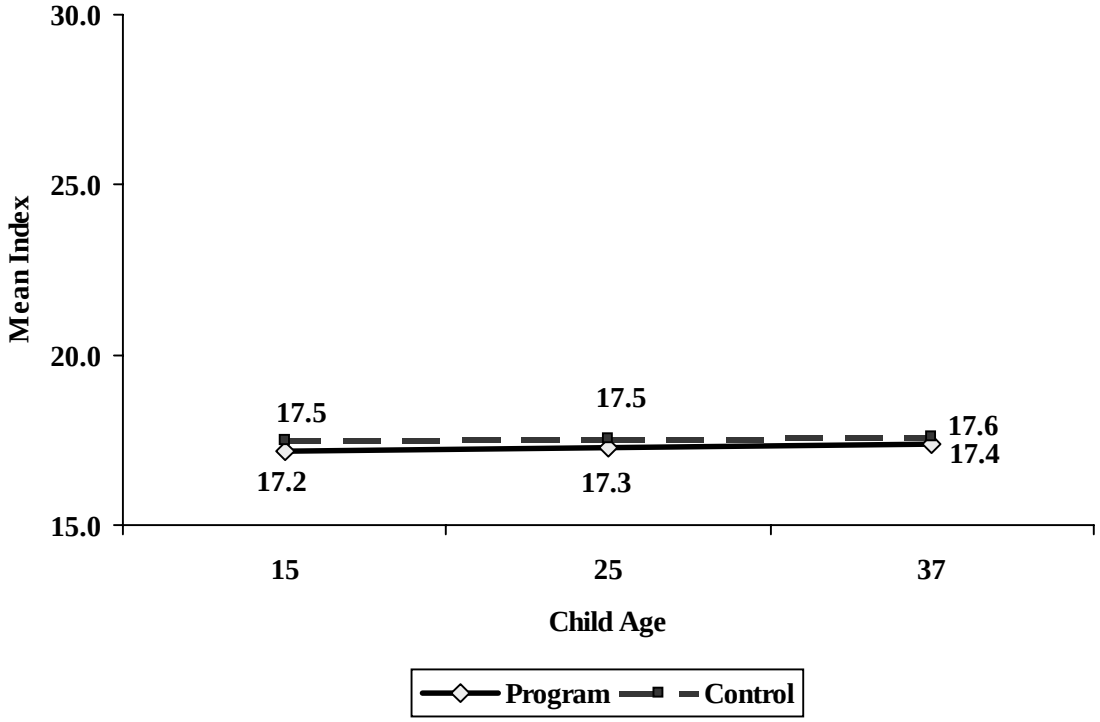
Note: The growth curve analysis differs from the other impact analyses in several respects. The sample includes only those children and parents for whom we completed the assessments at all three ages. In addition, due to analytic complications, the growth curve analysis pooled the observations across sites rather than weighting by sites as was done for the point-in-time regression adjusted impact analyses. Appendix D.5 includes details on the sample sizes, estimated intercepts and slopes (growth rates) for each group, and the impacts on each. Hierarchical linear modeling produced the regression lines for the program and control groups. Asterisks indicate the significance of the difference between the regression lines at 15, 25, and 37 months:

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

[a] Impact on the slope of the curves is statistically significant at p<.10, that is, the slope for the program group declines at a somewhat steeper rate than does the control group's.

FIGURE D.5J

PARENT-CHILD DYSFUNCTIONAL INTERACTION (PSI)

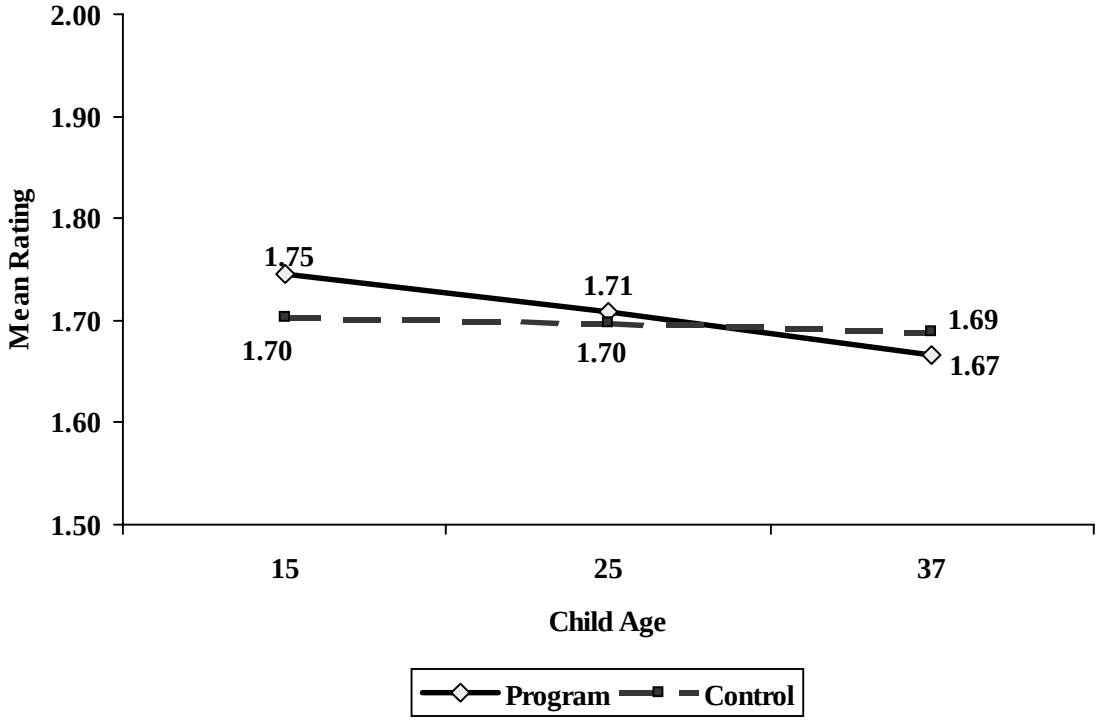


Source: Parent interview conducted when children were approximately 15, 25, and 37 months old. The 12-item scale yields scores that can range from 12 to 60 (see Box V.8 and Appendix C).

Note: The growth curve analysis differs from the other impact analyses in several respects. The sample includes only those children and parents for whom we completed the assessments at all three ages. In addition, due to analytic complications, the growth curve analysis pooled the observations across sites rather than weighting by sites as was done for the point-in-time regression adjusted impact analyses. Appendix D.5 includes details on the sample sizes, estimated intercepts and slopes (growth rates) for each group, and the impacts on each. Hierarchical linear modeling produced the regression lines for the program and control groups. Asterisks indicate the significance of the difference between the regression lines at 15, 25, and 37 months.

FIGURE D.5K

FAMILY CONFLICT (FAMILY ENVIRONMENT SCALE)[a]



Source: Parent interview conducted when children were approximately 15, 25, and 37 months old. The 5-item scale yields an average item score ranging from 1 to 4 (see Box V.8 and Appendix C).

Note: The growth curve analysis differs from the other impact analyses in several respects. The sample includes only those children and parents for whom we completed the assessments at all three ages. In addition, due to analytic complications, the growth curve analysis pooled the observations across sites rather than weighting by sites as was done for the point-in-time regression adjusted impact analyses. Appendix D.5 includes details on the sample sizes, estimated intercepts and slopes (growth rates) for each group, and the impacts on each. Hierarchical linear modeling produced the regression lines for the program and control groups. Asterisks indicate the significance of the difference between the regression lines at 15, 25, and 37 months.

[a] Impact on the slope of the curves is statistically significant at $p<.10$, that is, the slope for the program group declines at a somewhat steeper rate than does the control group's.

D.6 ESTIMATING IMPACTS PER ELIGIBLE APPLICANT

In the analyses reported in Volume I, we focus on impacts per applicant for the child and family outcomes, because these impact estimates are more policy relevant and differ very little from the impacts per eligible applicant. Because it is common in randomized clinical trials to base impact conclusions on all eligible applicants for the treatment, we wanted to determine whether impacts based on participants would differ from those based on our analysis of all eligible applicants. Tables D.6A through D.6N show the impacts per eligible applicant for key outcome variables, to illustrate how similar the impact findings are to those based on participants.

TABLE D.6A

IMPACTS ON COGNITIVE AND LANGUAGE DEVELOPMENT AT AGE 3

Outcome	Program Group	Control Group	Estimated Impact per Applicant[a]	Effect Size[b]
Bayley Mental Development Index (MDI)				
MDI Standard Score	91.3	89.9	1.4**	10.6
Percent with Bayley MDI Below 85	28.1	31.8	-3.7*	-8.0
Peabody Picture Vocabulary Test 3 (PPVT-III)				
PPVT-III Standard Score	82.8	81.0	1.8**	11.1
Percent with PPVT-III Below 85	51.9	57.1	-5.2**	-10.5
Sample Size				
Bayley	**879**	**779**	**1,658**	
PPVT	**738**	**665**	**1,403**	

SOURCE: Parent interview and child assessments conducted when children were approximately 36 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.6B

IMPACTS ON POSITIVE SOCIAL-EMOTIONAL DEVELOPMENT AT AGE 3

Outcome	Program Group	Control Group	Estimated Impact per Applicant[a]	Effect Size[b]
Child Engagement of Parent During Play[c]	4.8	4.6	0.2***	17.7
Child Sustained Attention to Objects During Play[c]	5.0	4.8	0.1***	14.0
Child Engagement of Parent During Puzzle Challenge Task[d]	5.0	4.9	0.1*	8.3
Child Persistence During Puzzle Challenge Task[d]	4.6	4.5	0.1	5.7
Bayley Behavior Rating Scale (BRS): Emotional Regulation in a Cognitive Task (Average Score)[e]	4.0	4.0	0.0	0.5
BRS: Orientation/Engagement in a Cognitive Task (Average Score)[e]	3.9	3.8	0.0	3.4
Sample Size				
Parent-Child Interactions	**875**	**784**	**1,659**	
Bayley BRS	**936**	**833**	**1,769**	

SOURCE: Child assessments, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

[c]Behaviors were observed during the videotaped parent-child semistructured play task and coded on a seven-point scale.

[d]Behaviors were observed during the videotaped parent-child puzzle challenge task and coded on a seven-point scale.

[e]Behaviors were observed during the Bayley assessment and rated on a five-point scale by the interviewer/assessor.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.6C

IMPACTS ON NEGATIVE SOCIAL-EMOTIONAL DEVELOPMENT AT AGE 3

Outcome	Program Group	Control Group	Estimated Impact per Applicant[a]	Effect Size[b]
Child Negativity Toward Parent During Play[c]	1.2	1.3	-0.1**	-12.2
Child Frustration with Challenge Task[d]	2.7	2.7	0.0	2.9
ASEBA: Aggressive Behavior Scale (Average Score)	10.7	11.3	-0.6**	-8.7
Sample Size				
Parent Interview	**1,107**	**1,003**	**2,110**	
Parent-Child Interactions	**875**	**784**	**1,659**	

SOURCE: Parent interviews and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

[c]Behaviors were observed during the videotaped parent-child semistructured play task and coded on a seven-point scale.

[d]Behaviors were observed during the videotaped parent-child puzzle challenge task and coded on a seven-point scale.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.6D

IMPACTS ON EMOTIONALLY SUPPORTIVE PARENTING AT AGE 3

Outcome	Program Group	Control Group	Estimated Impact per Applicant[a]	Effect Size[b]
Home Observation for Measurement of the Environment (HOME): Warmth[c]	2.6	2.5	0.1*	8.2
Parent-Child Structured Play: Supportiveness[d]	4.0	3.9	0.1***	12.7
Parent-Child Puzzle Task: Supportive Presence[e]	4.5	4.4	0.1	4.4
Sample Size				
Parent Interview	**1,107**	**1,003**	**2,110**	
Parent-Child Interactions	**874**	**784**	**1,658**	

SOURCE: Parent interviews and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

[c]Behaviors were observed during the HOME assessment and rated on a yes/no scale by the interviewer/assessor.

[d]Behaviors were observed during the videotaped parent-child semi-structured play task and coded on a seven-point scale. Supportiveness is a combination of Warm Sensitivity and Positive Regard.

[e]Behaviors were observed during the videotaped parent-child puzzle challenge task and coded on a seven-point scale.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.6E

IMPACTS ON THE HOME ENVIRONMENT AND STIMULATION OF LANGUAGE AND LEARNING AT AGE 3

Outcome	Program Group	Control Group	Estimated Impact per Applicant[a]	Effect Size[b]
Home Observation for Measurement of the Environment (HOME) – Total Score	27.4	27.0	0.5**	9.9
Structuring the Child's Day				
Percentage of Parents Who Set a Regular Bedtime for Child	59.6	58.2	1.3	2.7
Percentage of Parents and Children Who Have Regular Bedtime Routines	69.3	68.6	0.8	1.7
Parent-Child Activities and Learning Support				
HOME: Support of Language and Learning	10.6	10.4	0.2**	8.8
Parent-Child Activities	4.4	4.3	0.1*	7.1
Parent-Child Puzzle Task: Quality of Assistance[c]	3.6	3.5	0.1*	8.4
Percentage of Parents Who Read to Child Every Day	56.5	52.2	4.3**	8.7
Percentage of Parents Who Regularly Read to Child at Bedtime	32.2	29.2	3.0	6.6
Internal Home Environment				
HOME: Internal Physical Environment	7.8	7.8	0.0	0.5
Sample Size				
Parent Interview	**1,107**	**1,003**	**2,110**	
Parent-Child Interactions	**874**	**784**	**1,658**	

SOURCE: Parent interviews, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

[c]Behaviors were observed during the videotaped parent-child puzzle challenge task and coded on a seven-point scale.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.6F

IMPACTS ON NEGATIVE PARENTING BEHAVIOR
IN STRUCTURED PLAY AND INTERACTION AT AGE 3

Outcome	Program Group	Control Group	Estimated Impact per Applicant[a]	Effect Size[b]
Insensitivity				
Parent-Child Structured Play: Detachment[c]	1.2	1.3	-0.1*	-8.6
Parent-Child Structured Play: Intrusiveness[c]	1.6	1.6	-0.0	-5.2
Parent-Child Puzzle Task: Detachment[d]	1.6	1.6	-0.0	-0.5
Parent-Child Puzzle Task: Intrusiveness[d]	2.7	2.7	-0.1	-5.3
Hostility and Punishment				
Parent-Child Structured Play: Negative Regard[c]	1.3	1.3	-0.0	-1.5
Home Observation for Measurement of the Environment (HOME): Harshness[e]	0.3	0.3	0.0	1.5
Percentage of Parents Who Spanked the Child in the Previous Week	47.4	53.6	-6.3***	-12.6
Sample Size				
Parent Interview	**1,107**	**1,003**	**2,110**	
Parent-Child Interactions	**874**	**784**	**1,658**	

SOURCE: Parent interviews, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

[c]Behaviors were observed during the videotaped parent-child semi-structured play task and coded on a seven-point scale.

[d]Behaviors were observed during the videotaped parent-child puzzle challenge task and coded on a seven-point scale.

[e]Behaviors were observed during the HOME assessment and rated on a yes/no scale by the interviewer/assessor.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.6G

IMPACTS ON PARENTING KNOWLEDGE: SAFETY AND DISCIPLINE STRATEGIES AT AGE 3

Outcome	Program Group	Control Group	Estimated Impact per Applicant[a]	Effect Size[b]
Safety Practices				
Always Uses Car Seat for Child	70.3	70.7	-0.4	-0.8
Discipline Strategies				
Percentage of Parents Who Suggested Responses to Hypothetical Situations with Child:				
Prevent or distract	69.9	68.8	1.2	2.5
Remove child or object	80.8	81.2	-0.4	-1.2
Talk and explain	70.5	69.2	1.3	2.7
Time out	27.2	27.2	0.0	0.0
Threaten or command	10.5	13.4	-2.9**	-8.5
Shout	8.5	8.3	0.1	0.4
Physical punishment	46.9	51.2	-4.3**	-8.6
Percentage of Parents Suggesting Only Mild Responses to the Hypothetical Situations[c]	44.3	40.5	3.8*	7.8
Index of Severity of Discipline Strategies Suggested[d]	3.4	3.5	-0.2***	-10.0
Sample Size	**1,107**	**1,003**	**2,110**	

SOURCE: Parent interviews conducted when children were approximately 36 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

[c]Parents were classified as suggesting only mild discipline if their responses to the three discipline situations include only the following: prevent or distract, remove child or object, talk and explain, time out, restrain child, ignore child, warn or remind, or bribe child.

[c]The Index of Severity of Discipline Strategies is based on a hierarchy of discipline practices, from talk and explain, remove child or object, time out, or prevent/distract (1) through physical punishment (5). The most severe approach suggested is used to code this scale.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.6H

IMPACTS ON PARENT HEALTH, MENTAL HEALTH, AND FAMILY FUNCTIONING AT AGE 3

Outcome	Program Group	Control Group	Estimated Impact per Applicant[a]	Effect Size[b]
Parent's Physical Health				
Parent's Health Status	3.4	3.5	-0.0	-4.2
Parent's Mental Health				
Parental Distress	24.8	25.5	-0.7	-7.1
Parent-Child Dysfunctional Interaction	17.8	17.7	0.0	0.4
CES-Depression Scale (CES-D; short form)	7.4	7.7	-0.3	-3.6
CES-D: Severe Depressive Symptoms	14.3	14.9	-0.6	-1.6
Family Functioning				
Family Environment Scale–Family Conflict (Average Score)	1.7	1.7	-0.0	-4.3
Sample Size	**1,107**	**1,003**	**2,110**	

SOURCE: Parent interviews conducted when children were approximately 36 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.6I

IMPACTS ON SELF-SUFFICIENCY ACTIVITIES 28 MONTHS AFTER RANDOM ASSIGNMENT

Outcome	Program Group	Control Group	Estimated Impact per Applicant[a]	Effect Size[b]
Any Self-Sufficiency Activities				
Percentage of Parents Ever Employed or in an Education or Job Training Program in First 26 Months	93.3	90.2	3.1**	10.2
Average Hours per Week Employed at All Jobs and in Any Education or Training in First 26 Months	22.0	20.6	1.4**	8.7
Employment Activities				
Percentage of Parents Ever Employed in First 26 Months	86.1	83.1	3.0*	8.1
Average Hours per Week Employed at All Jobs in First 26 Months	16.9	16.8	0.1	0.9
Education Activities				
Percentage of Parents Who Ever Participated in an Education or Training Program in First 26 Months	59.3	51.5	7.8***	15.6
Average Hours per Week in an Education Program During First 26 Months	4.5	3.4	1.1***	16.7
Sample Size	**1,139**	**1,097**	**2,236**	

SOURCE: Parent services follow-up interviews conducted an average of 7, 16, and 28 months after random assignment.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.6J

IMPACTS ON EDUCATION ACTIVITIES AND CREDENTIALS
28 MONTHS AFTER RANDOM ASSIGNMENT

Outcome	Program Group	Control Group	Estimated Impact per Applicant[a]	Effect Size[b]
Types of Education Activities				
High School	13.5	9.4	4.1***	14.3
High School or Alternative	14.3	10.8	3.5***	11.6
Adult Basic Education	4.4	3.7	0.8	4.2
English as a Second Language	3.3	2.4	0.9	6.5
GED Preparation	10.1	8.8	1.2	4.4
Any Vocational Education	19.7	17.3	2.4	6.5
Two-Year College	10.9	10.2	0.7	2.4
Four-Year College	5.9	5.7	0.3	1.1
Degrees and Credentials Received				
Highest Grade Completed at Second Followup	11.6	11.6	-0.1	-3.0
GED Certificate	10.6	11.5	-1.0	-3.0
High School Diploma	49.2	48.4	0.8	1.6
Vocational, Business, or Secretarial Diploma	16.9	16.9	0.0	0.1
Associate's Degree	3.5	4.5	-1.0	-5.1
Bachelor's Degree	4.6	5.4	-1.4	-6.3
Sample Size	**1,139**	**1,097**	**2,236**	

SOURCE: Parent services follow-up interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

*Significantly different from zero at the .10 level, two-tailed test
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.6K

IMPACTS ON WELFARE PROGRAM PARTICIPATION 28 MONTHS AFTER RANDOM ASSIGNMENT

Outcome	Program Group	Control Group	Estimated Impact per Applicant[a]	Effect Size[b]
Welfare Program Participation				
Percentage of Parents Who Received Any Welfare Benefits During First 26 Months	68.4	66.8	1.6	3.4
Total Welfare Benefits Received During First 26 Months	$5,411	$5,607	-$196	-2.6
Percentage of Parents Who Received AFDC or TANF Benefits During First 26 Months	47.1	45.1	2.0	4.0
Total AFDC or TANF Benefits Received During First 26 Months	$2,171	$2,196	-$25	-0.6
Average Total Food Stamp Benefits Received During First 26 Months	$2,141	$2,099	$42	1.5
Sample Size	**1,139**	**1,097**	**2,236**	

SOURCE: Parent services follow-up interviews conducted an average of 7, 16, and 28 months after random assignment.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

AFDC = Aid to Families with Dependent Children; TANF = Temporary Assistance for Needy Families.

TABLE D.6L

IMPACTS ON FAMILY INCOME AND RESOURCES 28 MONTHS AFTER RANDOM ASSIGNMENT

Outcome	Program Group	Control Group	Estimated Impact Per Applicant[a]	Effect Size[d]
Percentage of Families with Income Above the Poverty Line at Third Followup	41.7	42.5	-0.7	-1.5
Total Family Resources Scale				
First Followup	149.6	148.5	1.0	4.9
Second Followup	152.8	151.5	1.3	6.8
Third Followup	154.5	153.5	1.0	5.0
Sample Size	**1,139**	**1,097**	**2,236**	

SOURCE: Parent services follow-up interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

*Significantly different from zero at the .10 level, two-tailed test
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.6M

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3 OR 28 MONTHS AFTER RANDOM ASSIGNMENT, BY PROGRAM APPROACH IN FALL 1997

	Center-Based Programs					Home-Based Programs					Mixed Approach Programs			
Outcome	Program Group	Control Group	Impact Estimate Per Applicant[a]	Effect Size[b]		Program Group	Control Group	Impact Estimate Per Applicant[a]	Effect Size[b]		Program Group	Control Group	Impact Estimate Per Applicant[a]	Effect Size[b]
Child Cognitive and Language Development														
Average Bayley Mental Development Index (MDI)	88.8	88.1	0.6	4.8		93.9	92.7	1.1	8.6		89.7	88.3	1.4	10.6
Percentage with MDI < 85***	32.7	39.4	-6.8	-14.5		21.2	22.3	-1.2	-2.5		34.2	36.5	-2.3	-5.0
PPVT-III Standard Score	81.5	80.6	0.9	5.7		84.2	82.9	1.2	7.6		82.6	79.2	3.5**	21.2
Percentage with PPVT-III<85***	57.3	58.4	-1.1	-2.3		45.8	48.4	-2.5	-5.1		53.8	64.9	-11.1**	-22.3
Child Social-Emotional Development														
Child Behavior Checklist—Aggressive	10.0	10.8	-0.8	-12.1		11.2	11.7	-0.5	-7.1		10.7	11.2	-0.5	-8.5
Parent-Child Structured Play: Child Sustained Attention with Objects (Average)*	4.9	4.9	-0.0	-1.1		5.0	4.9	0.1	9.8		5.0	4.7	0.3***	28.7
Parent-Child Structured Play: Child Negativity Toward Parent (Average)	1.2	1.4	-0.1**	-21.9		1.3	1.3	-0.0	-6.2		1.3	1.3	-0.1	-14.4
Parent-Child Structured Play: Child Engagement (Average)	4.8	4.7	0.1	9.4		4.8	4.6	0.2**	18.5		4.8	4.5	0.3***	27.8
Puzzle Challenge Task: Child Engagement (Average)	5.0	4.9	0.1	5.6		5.1	5.0	0.1	6.0		5.0	4.9	0.1	13.3
Puzzle Challenge Task: Persistence	4.4	4.4	0.1	5.4		4.7	4.6	0.1	11.8		4.5	4.5	0.0	3.3
Puzzle Challenge Task: Frustration	2.5	2.7	-0.2	-12.6		2.7	2.6	0.1	6.3		2.8	2.7	0.1	9.8
Parenting														
Home Observation for Measurement of the Environment (HOME) Total Score	26.8	26.1	0.8*	16.2		28.2	28.1	0.2	3.1		26.9	26.4	0.5	10.8
Parent-Child Structured Play: Parent Supportiveness	4.0	4.0	0.0	3.3		4.0	3.9	0.1**	14.5		4.0	3.8	0.2**	19.7
Puzzle Challenge Task: Parent Supportive Presence	4.4	4.5	-0.1	-4.8		4.6	4.5	0.1	7.4		3.7	3.4	0.3**	23.7
Puzzle Challenge Task: Quality of Assistance	3.5	3.5	0.0	1.7		3.6	3.5	0.0	2.0		2.7	2.9	-0.1	-10.5
Parent Reads to Child Daily***	34.5	49.1	5.4	10.7		54.0	55.0	-1.0	-1.9		62.6	49.5	13.1***	26.2
Parent-Child Structured Play: Parent Detachment**	1.2	1.2	0.1	14.9		1.2	1.3	-0.1	-8.9		1.2	1.3	-0.1**	-22.8
Puzzle Challenge Task: Parent Detachment	1.6	1.6	0.0	3.3		1.6	1.6	-0.0	-3.4		1.6	1.8	-0.2	-15.8
Spanked Child Last Week***	51.7	59.3	-7.6	-15.2		44.5	49.7	-5.2	-10.5		45.9	56.2	-10.3**	-20.6
Parenting Stress Index (PSI) Parental Distress	24.0	24.7	-0.7	-7.8		25.0	26.2	-1.3**	-13.3		24.6	25.6	-1.0	-10.8

Table D.6M (*Continued*)

Outcome	Center-Based Programs				Home-Based Programs				Mixed Approach Programs			
	Program Group	Control Group	Impact Estimate Per Applicant[a]	Effect Size[b]	Program Group	Control Group	Impact Estimate Per Applicant[a]	Effect Size[b]	Program Group	Control Group	Impact Estimate Per Applicant[a]	Effect Size[b]
Self-Sufficiency												
Ever in Education or Training**	63.2	60.7	2.5	5.0	64.5	51.8	12.7***	25.4	52.7	45.6	7.1**	14.3
Average Hours per Week in Education or Training	5.1	4.7	0.4	6.1	4.1	3.2	0.8*	13.1	4.4	3.0	1.4***	22.1
Ever Employed***	90.9	87.9	3.1	8.2	87.9	81.9	6.0**	15.9	82.3	81.0	1.3	3.5
Average Hours/Week Employed	21.3	20.7	0.6	3.9	16.9	15.9	1.1	7.2	14.7	15.0	-0.2	-1.7
Subsequent Birth by 24 Months after Random Assignment***	15.7	20.1	-4.4	-9.8	24.8	30.4	-5.6	-12.5	26.6	28.4	-1.8	-4.1
Sample Size												
Parent Interview	**254**	**216**	**470**		**350**	**343**	**693**		**502**	**448**	**950**	
Parent-Child Interactions	**228**	**181**	**409**		**252**	**255**	**507**		**396**	**348**	**744**	

SOURCE: Parent interview and child assessments conducted when children were approximately 36 months old. Self-sufficiency information from parent service interviews completed an average of 28 months after random assignment.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

*Significantly different from zero at the .10 level, two-tailed [or one-tailed] test.
**Significantly different from zero at the .05 level, two-tailed [or one-tailed] test.
***Significantly different from zero at the .01 level, two-tailed [or one-tailed] test.

TABLE D.6N

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3 OR 28 MONTHS AFTER RANDOM ASSIGNMENT, BY PATTERN OF IMPLEMENTATION

	Early Implementers					Late Implementers					Incomplete Implementers			
Outcome	Program Group	Control Group	Impact Estimate Per Applicant[a]	Effect Size[b]		Program Group	Control Group	Impact Estimate Per Applicant[a]	Effect Size[b]		Program Group	Control Group	Impact Estimate Per Applicant[a]	Effect Size[b]
Child Cognitive and Language Development														
Average Bayley Mental Development Index (MDI)	94.1	92.0	2.1*	16.1		88.0	86.1	1.9**	14.8		91.8	92.0	-0.3	-2.0
Percentage with MDI < 85***	21.3	26.6	-5.3	-11.4		37.0	42.7	-5.7	-12.3		25.4	25.8	-0.4	-0.8
PPVT-III Standard Score	86.0	84.7	1.2	7.6		77.8	75.0	2.7*	16.8		83.9	82.8	1.1	6.9
Percentage with PPVT-III < 5***	42.2	49.4	-7.2	-14.5		65.7	70.7	-4.9	-9.9		49.2	53.1	-3.9	-7.8
Child Social-Emotional Development														
Child Behavior Checklist—Aggressive	10.9	11.6	-0.7	-10.7		10.9	11.1	-0.1	-2.2		10.1	11.5	-1.4**	-21.7
Parent-Child Structured Play: Child Sustained Attention with Objects (Average)	5.1	5.0	0.1	13.1		4.8	4.7	0.1	11.5		5.0	4.8	0.2**	19.3
Parent-Child Structured Play: Child Negativity Toward Parent (Average)	1.2	1.3	-0.1**	-17.0		1.3	1.3	-0.1	-7.8		1.3	1.3	-0.1	-8.1
Parent-Child Structured Play: Child Engagement (Average)	4.9	4.8	0.1	10.2		4.7	4.5	0.2**	20.0		4.8	4.5	0.3***	30.8
Puzzle Challenge Task: Child Engagement (Average)	5.1	5.0	0.1	6.5		4.9	4.9	0.1	5.3		5.1	5.0	0.2	15.1
Puzzle Challenge Task: Persistence	4.7	4.7	-0.0	-2.2		4.4	4.4	0.1	6.7		4.6	4.4	0.2*	18.3
Puzzle Challenge Task: Frustration	2.9	2.9	-0.0	-2.1		2.6	2.5	0.2	13.2		2.6	2.6	0.0	2.3
Parenting														
Home Observation for Measurement of the Environment (HOME) Total Score	28.1	27.2	0.9**	19.0		26.2	26.0	0.2	3.8		28.1	27.7	0.4	7.5
Parent-Child Structured Play: Parent Supportiveness	4.1	4.1	0.0	4.3		3.8	3.6	0.2**	18.4		4.0	3.8	0.2*	18.7
Puzzle Challenge Task: Parent Supportive Presence	4.9	4.8	0.1	10.1		4.1	4.1	0.0	1.1		4.4	4.4	0.0	3.3
Puzzle Challenge Task: Quality of Assistance	3.9	3.9	0.1	4.0		3.4	3.2	0.2***	18.8		3.4	3.4	0.0	1.4
Parent Reads to Child Daily***	65.5	54.7	10.8***	21.6		48.3	43.0	5.3	10.5		57.5	58.7	-1.1	-2.2
Parent-Child Structured Play: Parent Detachment	1.2	1.2	0.0	2.0		1.2	1.3	-0.1**	-17.2		1.2	1.3	-0.1	-9.8
Puzzle Challenge Task: Parent Detachment	1.6	1.6	-0.0	-2.8		1.7	1.7	-0.0	-3.4		1.6	1.7	-0.0	-3.7
Spanked Child Last Week***	43.6	51.5	-7.8*	-15.7		48.1	55.9	-7.8**	-15.7		49.3	55.0	-5.7	-11.3
Parenting Stress Index (PSI) Parental Distress	24.2	24.9	-0.7	-7.3		26.0	26.6	-0.6	-6.1		23.8	25.1	-1.3	-13.7

Table D.6N (*Continued*)

Outcome	Early Implementers				Late Implementers				Incomplete Implementers			
	Program Group	Control Group	Impact Estimate Per Applicant[a]	Effect Size[b]	Program Group	Control Group	Impact Estimate Per Applicant[a]	Effect Size[b]	Program Group	Control Group	Impact Estimate Per Applicant[a]	Effect Size[b]
Self-Sufficiency												
Ever in Education or Training**	59.4	52.5	6.9*	13.9	54.3	49.8	4.5	9.1	63.8	53.4	10.4***	20.8
Average Hours per Week in Education or Training	3.3	3.0	0.2	3.8	4.2	3.2	1.1**	16.5	6.1	4.4	1.7***	27.3
Ever Employed***	90.1	84.7	5.4**	14.3	82.2	82.5	-0.3	-0.7	86.5	81.4	5.1	13.6
Average Hours/Week Employed	18.3	16.8	1.5	10.2	16.2	17.0	-0.8	-5.5	16.4	16.2	0.1	0.8
Subsequent Birth by 24 Months after Random Assignment***	22.9	29.0	-6.1	-13.6	25.6	26.1	-0.5	-1.2	20.4	27.0	-6.5	-14.5
Sample Size												
Parent Interview	**254**	**216**	**470**		**350**	**343**	**693**		**502**	**448**	**950**	
Parent-Child Interactions	**228**	**181**	**409**		**252**	**255**	**507**		**396**	**348**	**744**	

SOURCE: Parent interview and child assessments conducted when children were approximately 36 months old. Self-sufficiency information from parent service interviews completed an average of 28 months after random assignment.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[b]The effect size was calculated by dividing the estimated impact per applicant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

*Significantly different from zero at the .10 level, two-tailed [or one-tailed] test.
**Significantly different from zero at the .05 level, two-tailed [or one-tailed] test.
***Significantly different from zero at the .01 level, two-tailed [or one-tailed] test.

D.7 RESULTS FROM THE SERVICE INTENSITY ANALYSIS

Families in the program group received different amounts of Early Head Start services. The amount and nature of services that a particular family received was determined in part by family members themselves (because Early Head Start is a voluntary program), as well as by the amount and nature of services they were offered. Thus, the level of services received by families differed both within programs and across programs.

An important policy issue is the extent to which impacts on key outcomes varied for families who received different levels of service intensity. In Chapter III of Volume I, we identified family and site characteristics that are associated with high levels of service receipt. We then used this information to examine whether estimated impacts on key outcomes were larger for subgroups of families who received intensive services than for subgroups of families who received less intensive services. This approach only indirectly assesses whether service intensity matters, because there may be other factors besides differences in service intensity that can account for differences in impacts across subgroups.

This appendix describes our analysis to more directly assess the extent to which service intensity matters. First, we present our methodological approach, and second, the analysis findings.

1. Methodological Approach

As discussed in Chapter II, the estimation of dosage effects is complicated by the potential presence of *unobservable* differences between families who received different amounts of services that are correlated with child and family outcomes. If uncorrected, this "sample selection" problem can lead to seriously biased estimates of dosage effects. This section discusses our approach for adjusting for this potential selection problem.

a. Propensity Scoring

We used "propensity scoring" (Rosenbaum and Rubin 1985) as our primary approach, to try to account for sample selection bias when estimating dosage effects. In our context, this procedure identified control group members who would have been likely to receive intensive services and those who would not have been likely to receive intensive services if they had instead been assigned to the program group. Impacts for the high-service intensity group were then estimated by comparing the outcomes of program and control group families in the high-service intensity group, and similarly for the low-service intensity group. We then compared these two sets of impact estimates.

We used two versions of the propensity scoring approach: (1) the "*matching method*" and (2) the "*cutoff method.*"

The Matching Method. This method was implemented as follows:

- ***Using the program group only, we estimated logit regression models predicting whether a family received intensive services.*** For analytic simplicity and sample size considerations, we conducted the analysis by classifying program group families into two groups: a high-service intensity group and a low-service intensity group (including those who received no services). We then estimated a logit model where the probability a program group family received intensive services was regressed on child and family characteristics measured at baseline and site indicator variables. The explanatory variables used in these logit models were posited to be associated with service intensity and with the child and family outcome measures, and were the same ones as those used in the regression models for the basic impact analysis (see Table II.6 in the main report).[9]
- ***Predicted probabilities (propensity scores) were calculated for each program and control group member.*** The propensity scores were constructed using the parameter estimates from the logit models and the sample members' explanatory variable values. The propensity scores are a function (weighted average) of the observable characteristics of the families.

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[9]We did not estimate separate logit models by site because of small sample sizes.

- ***Using the propensity scores, we matched a control group family to each program group family.*** A control group family was selected as a match for a program group family if, among all controls, it had the closest propensity score value to that of the program group family. *Matching* was performed with *replacement*, so that a control group family could be a match for multiple program group families.[10]

- ***Dosage effects were then estimated by comparing the outcomes of program group members to their matched controls for each service intensity group.*** Impacts for those who received intensive services were estimated by comparing the average outcomes of program group members who received intensive services to the average outcomes of their *matched* controls. Similarly, impacts for those in the low-service intensity group were estimated by comparing the average outcomes of program group families who did not receive intensive services with their matched controls.

This propensity scoring procedure uses a flexible functional form to match control group members to program group members, based on their observable characteristics (that is, it adjusts for selection on observable variables). The procedure assumes that if the distributions of observable characteristics are similar for program group families and their matched controls in each service intensity group, then the distributions of *unobservable* characteristics for program and control group families should also be similar in each service intensity group. Under this (untestable) assumption, the procedure yields unbiased estimates of dosage effects.[11]

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[10]As discussed below, we conducted statistical tests to assess the adequacy of the matching process. If these statistical tests failed, we re-estimated the logit regression models by including interaction terms as additional explanatory variables in the models (see Dehejia and Wahba 1999; Rubin 2001).

[11]There are also cross-sectional statistical methods (such as instrumental variable estimation techniques) that directly account for sample selection bias due to *unobservable* variables (Heckman and Robb 1985). These methods, however, rely on finding (instrumental) variables that are correlated with service intensity but are uncorrelated with unobservable factors associated with the child and family outcomes. Given our available data, we have not been able to identify credible instrumental variables, and thus, do not employ these methods. However, as discussed later in this section, we use *longitudinal* "fixed-effects" methods which do account for selection bias due to unobservable factors.

The Cutoff Method. We also estimated dosage effects using a variant of the matching method, which we refer to as the *cutoff method*. The cutoff method is based on the fact that, because of random assignment, the expected percentage of control group members who would have received intensive services if they had instead been assigned to the program group should be *equal* to the percentage of program group members who actually received intensive services (which, as described below, is about 33 percent using the self-reported measure from the PSI data). Similarly, we expect that 67 percent of control group families would have received less-intensive services. Thus, we can divide both the program and control groups into those with the largest propensity scores (the high-service intensity group) and those with lowest propensity scores (the low-service intensity group), and estimate impacts for each group.

Specifically, the cutoff method was implemented as follows:

- ***The high-service intensity group was created by selecting program and control group members with large propensity scores, and the low-service intensity group was created by selecting those with smaller propensity scores.*** The high-service intensity group included the 33 percent of program group members with the largest propensity scores among all program group members, and the 33 percent of control group members with the largest propensity scores among all controls. Similarly, the low-service intensity group included the remaining 67 percent of sample members with smaller propensity scores.
- ***Dosage effects were then estimated by comparing the average outcomes of program and control group members within each service intensity group.*** Impacts for those who received intensive services were obtained by comparing the average outcomes of program and control group members in the high-service intensity group. Similarly, impacts for those who received fewer services were obtained by comparing the average outcomes of program and control group families in the low–service intensity group.

Importantly, the matching and cutoff methods should produce similar results if the propensity scores are capturing important differences between high- and low-service intensity families that are correlated with the outcome measures. Thus, as discussed in the next section,

we examined the similarity of the impact results using the two methods to test the reliability of the propensity scoring approach.

Interpretation of the Impact Estimates. A subtle, but important, point concerns the interpretation of the impact estimates using the matching and cutoff methods. The estimated impacts for the high service-intensity group tell us about the effects of Early Head Start for those families who *chose to receive or had access to* a significant amount of services. Similarly, the estimated impacts for the low service-intensity group tell us about program effects for those families who chose to receive or had access to smaller amounts of services. The two types of families are very different. Thus, the impact findings *do not* tell us about how those families in the low service intensity group would have fared if they had received more services. Nor do the impact estimates tell us about the extent to which the outcomes of an average family would have improved if that family received additional services. Instead, the findings shed light on the effectiveness of Early Head Start for those who opt to receive significant amounts of services and for those who opt to receive fewer services. We believe that these are the policy-relevant questions, because Early Head Start is a voluntary program and not a mandatory one; thus, families cannot be forced to receive a minimum amount of services.

Goodness-of-Fit Tests. The propensity scoring approach uses the predicted probabilities from the logit models to classify sample members into high- or low-service intensity groups. A fundamental question, however, is: Are families classified correctly? Clearly, we can only obtain credible impact estimates for the two service intensity groups if families are partitioned correctly into the two groups (and in particular, for control group families whose service intensity measures are not observed).

We use three categories of statistical goodness-of-fit tests to assess the success of the propensity scoring procedure: (1) those based on the parameter estimates from the logit models;

(2) those based on the quality of the matches and group designations; and (3) those based on the outcome variables—the best tests.

The first category includes goodness-of-fit measures for the parameter estimates from the logit models. For each model, we examine the pseudo-R^2 value (which is based on the likelihood ratio statistic and can range from 0 to 1) and the magnitude and statistical significance of the estimated parameters. If a model has a large pseudo-R^2 value and many significant and large estimated parameters, then the explanatory variables in the model can effectively distinguish between high- and low-dosage families. In this case, the propensity scoring procedure may produce unbiased estimates, because many sample members are likely to be classified correctly. The problem with these goodness-of-fit measures, however, is that a low pseudo-R^2 value or few significant explanatory variables does not necessarily imply that the propensity scoring approach is unsuccessful, because there may, in fact, be few differences between those who received intensive services and those who did not. Furthermore, even if the goodness-of-fit measures are favorable, the propensity scoring procedure may not be successful if the explanatory variables are not highly correlated with the outcome variables (which is usually the case; see Chapter II).

The second category of goodness-of-fit measures are based on the quality of the matches and group designations. We conducted the following tests:

1. ***For the matching method, we compared, for each service intensity group, the distribution of the explanatory variables and propensity scores of program group members and their matched controls within each of five propensity scoring groups.*** We sorted the program group on the basis of their propensity scores from largest to smallest, and used this ordering to divide the program group into five propensity scoring groups of equal size. This analysis was done separately for high- and low-dosage program group families. We then compared the distribution of the baseline characteristics and propensity scores of program families and their matched controls within each propensity scoring group. If the matching process was determined to be unsatisfactory on the basis of these statistical tests, we re-estimated the logit regression models by including interaction terms as additional explanatory variables in the models (see Dehejia and Wahba 1999; Rubin 2001). The process was continued until a satisfactory model specification was found.

2. ***For the matching method, we computed the proportion of matched controls who were assigned to both the high-service and low-service intensity groups.*** As discussed, the matching process was conducted with replacement so that a control group family could be a match for more than one program group family. The overlap between matched controls in the low- and high-dosage groups should be less for models that predict well than for models with less predictive power. Thus, we compared the overlap from our matching process to the overlap that would be expected if controls were *randomly* matched with replacement to each program group family. Similarly, we calculated the percentage of all control group members who were in the matched control group samples.

3. ***For the cutoff method, we examined the proportion of program group families who were "assigned" to the high-dosage group who actually received intensive services, and similarly for program group families who were assigned to the low-dosage group.*** These proportions (that is, correct classification rates) were compared to the correct classification rates that would be expected if program group families were *randomly* assigned to the two dosage groups.

The final category of goodness-of-fit tests are based on the mean values of, and the impacts on, the outcome variables. Because these tests are based directly on the outcomes of interest, they are the best tests to assess the success of the propensity scoring procedure. Specifically, we conducted the following tests:

1. ***For the matching method, we tested, for each outcome measure, whether the weighted average of the mean outcome for the controls in the high- and low-dosage groups equals the mean outcome for the full control group.*** The aim of the matching method is to *partition the full* control group into two dosage groups. Thus, if this procedure was successful, the weighted average of the mean outcome for controls in the two dosage groups should equal the mean outcome for the *full* control group, where the weights are .33 and .67, respectively. Similarly, we assessed whether the weighted average of the *impact* estimates for the two dosage groups are similar to the impact estimates for the full sample, as should be the case for any subgroup analysis that divides the sample into mutually exclusive groups.

2. ***For the cutoff method, we compared the mean outcomes of "predicted" high-dosage (low-dosage) program group members to those of actual high-dosage (low-dosage) program group members.*** We expect that, if the mean outcomes for those in the "predicted" and "actual" dosage groups are similar for the program group, then it is likely that the mean outcomes for control group families in the two dosage groups are also accurate, and hence, that unbiased impact estimates can be obtained.

3. ***We compared impact results using the cutoff method and matching methods.*** As discussed, the cutoff and matching methods should yield similar impact results because they are both based on the same propensity scores and both partition the sample into two dosage groups.[12]

b. Fixed-Effects Method

In order to test the robustness of our findings using the propensity scoring approach, we also estimated dosage effects by (1) calculating, for each program group member, the difference between their 14- and 36-month outcomes (that is, the growth in their outcomes), and (2) comparing the mean difference in these growth rates for those who received intensive services and those who did not. This "fixed-effects" or "difference-in-difference" approach adjusts for selection bias by assuming that permanent unobservable differences between families in the two service intensity groups are captured by their 14-month measures. This analysis was conducted using only those outcomes that were measured at multiple time points.

Mathematically, dosage effects using the fixed-effects approach were obtained using variants of the following model:

$$(5)\quad (y_{36} - y_{14}) = \alpha_0 + \alpha_1 H + X\beta + \varepsilon,$$

where y_{36} is the outcome at 36 months, y_{14} is the outcome at 14 months, H is an indicator variable equal to 1 for high service-intensity program group members and to 0 for low service-intensity program group members, Xs are explanatory variables, ε is the disturbance term, and the αs and βs are parameters to be estimated. In some specifications, we did not include the explanatory

[12]An additional test that could be conducted for both the cutoff and matching methods is to test whether impacts on those who received *no* services were zero. In order to conduct this test, however, we would have needed to conduct the analysis using *three* service groups (received no services, received few services, and received intensive services) rather than two. However,

variables (that is, the *X*s), and in other specifications we included the 14-month outcome measure as an explanatory variable rather than as part of the dependent variable. The parameter, α_1, represents the difference in the growth of the outcome between high-service intensity and low-service intensity program group members (that is, the dosage effect).

Although intuitively appealing and widely used, this approach has several serious problems in our context. First, ideally, we would want to use *baseline* measures of the outcomes rather than 14-month measures, because program group families had already received some services at the 14-month point. Furthermore, the high service-intensity group had received more services on average than the low service-intensity group. Thus, the 14-month measures for the two groups are likely to have already been affected by Early Head Start in different ways, which could lead to biased estimates of dosage effects. Second, the fixed-effects approach assumes that in the *absence* of Early Head Start, the growth trajectories of outcomes for the low and high service-intensity groups would have been similar. This assumption, however, may not be realistic for some outcome measures. Finally, this analysis is restricted to those who have available data at 14 and 36 months.

c. Measures of Service Intensity

As discussed in Chapter II of Volume I, we estimated dosage effects using two overall measures of service intensity. First, we constructed a measure using data from the PSI and exit interviews. Families were categorized as receiving intensive services if they remained in the program for at least two years and received more than a threshold level of services. The threshold level for those in center-based sites was the receipt at least 900 total hours of Early

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(continued)

because fewer than 10 percent of the program group received no Early Head Start services, we

Head Start center care during the 26-month follow-up period. The threshold level for those in home-based sites was the receipt of home visits at least weekly in at least two of the three follow-up periods. Families categorized as receiving intensive services in mixed-approach sites were those who exceeded the threshold level for either center-based or home-based services. About one-third of program group families received intensive services using this definition. The service intensity rate varied from 8 to 56 percent across sites, but 9 of the 17 sites had a rate greater than 33 percent. This measure is missing for about 8 percent of program group families.

Second, we used a measure of program engagement provided by the sites for each family in the program group. Program staff rated each family as (1) consistently highly involved throughout their enrollment, (2) involved at varying levels during their enrollment, (3) consistently involved at a low level throughout their enrollment, (4) not involved in the program at all, or (5) they could not remember how involved the family was. Those 40 percent of families who were rated as consistently highly involved were considered to have received intensive services in our analysis. The program engagement rate ranged from 20 to 77 percent across sites, although 10 sites had a rate greater than 40 percent. The program engagement measure is missing for 7 percent of program group families.

There is some overlap between the two intensity measures, although there are many families who are classified as having receiving intensive services according to one measure but not the other. For example, about 58 percent of those classified as high dosage using the PSI measure were also classified as high dosage using the program engagement measure. Similarly, about half of those classified as high dosage using the program engagement measure were also classified as high dosage using the PSI measure.

(continued)

did not conduct this analysis.

The lack of perfect overlap between the two intensity measures reflects the different aspects of program involvement that they measure. The first measure is based on duration of enrollment and hours of center care or frequency of home visits and reflects the quantity of services received, while the second measure captures staff assessments of families' level of involvement in program services in terms of both attendance and emotional engagement in program activities.

To keep the presentation manageable, we present impact estimates for 28 key outcome variables spanning a range of types of outcomes.

2. Analysis Results

In this section, we first report results from the logit models, then present the impact findings.

a. Logit Model Results and Goodness-of-Fit Tests

Table D.7A displays, for each measure of service intensity, results from a logit model where the probability that a program group family received intensive services was regressed on family, child, and site characteristics. For ease of presentation, these models are a *simplified* version of the models actually used in the propensity scoring analysis, which included additional explanatory variables (see the previous section) and site indicator variables (rather than variables signifying key site characteristics). The table displays the regression-adjusted probability that a family received intensive services (that is, marginal probabilities) for each family, child, and site characteristic included in the models. The table also displays the significance of these marginal probabilities.

The parameter estimates on the explanatory variables are *jointly* statistically significant at the 1 percent significance level. This result holds for both the PSI intensity measure and the program engagement measure.

TABLE D.7A

REGRESSION-ADJUSTED PROBABILITY THAT A PROGRAM GROUP FAMILY RECEIVED INTENSIVE EHS SERVICES, BY SERVICE INTENSITY MEASURE AND SUBGROUP
(Percentages)

Variable[1]	Probability Family Received Intensive Services	
	Self-Reported PSI Measure	Program Engagement Measure
Total	32.7	40.3
Site Characteristics		
Program Approach		
Center-based	26.9	43.6
Home-based	39.0**	34.3***
Mixed (L)	28.5	46.1
Overall Implementation Level		
Early	40.6***	45.2
Late	32.8**	35.4
Incomplete (L)	21.9	40.9
Urban or Rural		
Urban	32.2	41.2
Rural (L)	33.2	39.4
Unemployment Rate		
Higher than 5 percent	22.9***	48.2**
5 percent of less (L)	35.7	38.1
Family and Parent Characteristics		
Mother's Age at Birth of Focus Child		
Less than 20	35.8	36.4
20 to 25	30.1	41.2
Older than 25 (L)	31.7	44.0
Race and Ethnicity		
White non-Hispanic (L)	34.2	40.6
Black non-Hispanic	30.4	36.3
Hispanic	35.1	46.0
Other	21.5**	34.4
Primary Language		
English	32.9	41.0
Other (L)	31.9	38.2
Mother's Education		
Less than grade 12 (L)	27.0	36.6
Grade 12 or earned a GED	39.8***	41.2
Greater than grade 12	35.2*	45.8*
Primary Occupation		
Employed (L)	33.3	48.6
In school or training	35.8	41.0
Neither	31.2	36.5***

TABLE D.7.A *(continued)*

Variable[1]	Probability Family Received Intensive Services	
	Self-Reported PSI Measure	Program Engagement Measure
Living Arrangements		
With spouse	33.5	44.8
With other adults	34.7	36.9
Alone (L)	29.8	40.5
Received AFDC/TANF		
Yes	29.6	37.8
No (L)	33.9	41.3
Received Food Stamps		
Yes	32.5	38.0
No (L)	32.8	42.2
Random Assignment Date		
Before 10/96 (L)	38.2	45.3
10/96 to 6/97	30.3**	35.3**
After 6/97	28.8**	39.8
Child Characteristics		
Age of Focus Child		
Unborn	30.0	35.7
Less than 5 months	33.3	40.1
5 months or older (L)	33.9	43.3
First Born		
Yes	29.7**	40.1
No (L)	37.6	40.7
Gender		
Male	32.9	41.0
Female (L)	32.4	39.7
Mother or Anyone Else Had Concerns About Child's Overall Health and Development		
Yes	34.4	42.2
No (L)	32.5	40.2
Child Received an Evaluation Because of Concerns About the Child's Overall Health and Development or Because of Suspected Developmental Delay		
Yes	37.1	40.8
No	32.5	40.3
Has Established or Biological/Medical Risks		
Yes	30.0	38.5
No	33.1	40.7
Sample Size	**1,076 Program Group Families**	**1,076 Program Group Families**

SOURCE: HSFIS and PSI Data

TABLE D.7.A *(continued)*

NOTES:

1. All estimates are regression-adjusted using logistic regression procedures where the probability a family in the program group received intensive services was regressed on the explanatory variables listed in the table.

2. For the PSI measure, families were categorized as receiving intensive services if they remained in the program for at least two years and received more than a threshold level of services. The threshold level for those in center-based sites was the receipt at least 900 total hours of Early Head Start center care during the 26-month follow-up period. The threshold level for those in home-based sites was the receipt of home visits at least weekly in at least 2 of the 3 follow-up periods. Families categorized as receiving intensive services in mixed-approach sites were those who exceeded the threshold level for either center-based or home-based services.

   The program engagement measure pertains to the family's level of engagement in Early Head Start as reported by site staff.

[1]An "L" signifies that the variable was left out of the regression models

*Difference between the regression-adjusted percentage for the subgroup relative to the percentage for the left-out subgroup is statistically significant at the .10 level, two-tailed test

**Difference between the regression-adjusted percentage for the subgroup relative to the percentage for the left-out subgroup is statistically significant at the .05 level, two-tailed test

***Difference between the regression-adjusted percentage for the subgroup relative to the percentage for the left-out subgroup is statistically significant at the .01 level, two-tailed test

We find some differences in service intensity levels across sites. Families in home-based programs were more likely to receive intensive services than those in center-based or mixed programs using the PSI intensity measure, but the opposite result holds using the program engagement measure. There is some evidence that service intensity levels were higher for families in sites that were early implementers than for families in other sites.

We find that better-off families were somewhat more likely to receive intensive services than were more disadvantaged families. For example, families were more likely to receive intensity services if the mother (1) had a high school degree, (2) was employed (for the program engagement measure), (3) was not receiving welfare, and (4) was living with her spouse or other adults. Importantly, however, the subgroup differences are not large, and few of the other family and child measures are statistically significant. The pseudo-R^2 values from the logit models used in the propensity scoring analysis are about .12 for both service intensity measures. These relatively low values suggest that the explanatory variables included in the models do not have substantial predictive power. As a further illustration of this point, only about 58 percent of those predicted to be in the high dosage group using the cutoff method actually received high-intensity services (using the PSI measure). This correct classification rate is substantially larger than the 33 percent that would be expected if random classifications were performed, but still suggests that the predicted high-dosage group contains a substantial number of misclassified families (and similarly for the low-dosage group).[13]

For the matching method, we find that the distributions of the baseline characteristics of program group families and their matched controls are similar for each service intensity group (see Table D.7B which shows results for the PSI measure). Very few of the differences in key

[13]The correct classification rate for those who were classified as low dosage is about 80 percent. The correct classification rates are similar using the program engagement measure.

TABLE D.7B

DISTRIBUTION OF THE CHARACTERISTICS OF PROGRAM GROUP FAMILIES AND THEIR MATCHED CONTROLS, BY SERVICE INTENSITY LEVEL (USING THE PSI MEASURE)

	High-Dosage Group		Low-Dosage Group		
Variable	Program Group	Matched Control Group	Program Group	Matched Control Group	All Controls
Site Characteristics					
Program Approach					
Center-based	16.7	17.3	22.8	24.3	20.2
Home-based	49.7	51.5	43.3	41.2	44.8
Mixed	33.6	31.2	34.0	34.6	35.0
Overall Implementation Level					
Early	44.8	39.8	30.7	32.6	36.3
Late	35.8	41.0	41.3	36.4	37.0
Incomplete	19.4	19.1	28.0	31.0	26.7
Urban	51.2	47.2	57.6	63.6**	58.2
Unemployment Rate Higher than 5 Percent	17.3	19.4	25.3	25.9	21.9
Family and Parent Characteristics					
Mother's Age at Birth of Focus Child					
Less than 20	37.0	36.5	39.5	42.4	38.9
20 to 25	33.8	34.6	31.8	30.4	33.4
Older than 25	29.3	28.8	28.7	27.2	27.8
Race and Ethnicity					
White non-Hispanic	47.8	47.9	35.0	29.4*	38.2
Black non-Hispanic	28.2	30.7	36.2	41.8	34.1
Hispanic	21.5	18.2	24.5	23.0	22.8
Other	2.5	3.2	4.4	5.8	4.9
Primary Language is English	83.0	80.9	77.7	77.7	78.2
Mother's Education					
Less than grade 12	38.0	39.3	49.9	53.9	46.2
Grade 12 or earned a GED	34.5	31.0	25.0	23.4	29.2
Greater than grade 12	27.5	29.7	25.1	22.7	24.6
Primary Occupation					
Employed	25.2	24.2	22.5	21.1	23.2
In school or training	21.7	23.9	23.1	26.6	21.0
Neither	53.2	51.9	54.4	52.3	55.8

TABLE D.7B (*continued*)

Variable	High-Dosage Group: Program Group	High-Dosage Group: Matched Control Group	Low-Dosage Group: Program Group	Low-Dosage Group: Matched Control Group	All Controls
Living Arrangements					
With spouse	30.9	27.8	24.6	23.2	26.9
With other adults	38.9	43.5	38.9	40.0	40.4
Alone	30.2	28.7	36.5	36.8	32.7
Received AFDC/TANF	30.0	27.1	35.4	35.4	33.2
Received Food Stamps	43.9	44.4	46.2	53.1**	46.8
Random Assignment Date					
Before 10/96	42.9	38.9	32.8	31.0	35.4
10/96 to 6/97	29.6	34.6	31.3	32.6	32.3
After 6/97	27.5	26.5	35.9	36.4	32.3
Child Characteristics					
Age of Focus Child					
Unborn	25.9	30.9	24.6	24.7	27.5
Less than 5 months	33.0	29.6	35.3	38.6	34.2
5 months or older	41.0	39.5	40.1	36.7	38.3
First Born	58.1	53.9	63.7	66.3	60.6
Male	50.9	46.9	49.9	48.8	50.3
Mother or Anyone Else Had Concerns About Child's Overall Health and Development	12.4	12.0	12.2	14.8	14.6
Child Received an Evaluation Because of Concerns About the Child's Overall Health and Development or Because of Suspected Developmental Delay	5.7	8.2	5.4	5.5	6.4
Has Established or Biological/Medical Risks	19.6	21.2	22.0	21.4	19.8
Sample Size	**324**	**324**	**668**	**668**	**1,011**

SOURCE: PSI and HSFIS data.

NOTE: Controls were matched to program group families with replacement using the propensity scoring approach (matching method) described in the text.

*Difference between program and matched control group is significantly different from zero at the .10 level, two-tailed test

** Difference between program and matched control group is significantly different from zero at the .05 level, two-tailed test.

*** Difference between program and matched control group is significantly different from zero at the .01 level, two-tailed test.

family and child characteristics between program and control group families in each dosage group are statistically significant, and program group members are clearly more similar to their matched controls than to the *full* control group. Thus, the procedure succeeded in producing equivalent groups on the basis of *observable* characteristics. However, only about 55 percent of control group families were matched to program group families, which is much lower than one might expect. Furthermore, the overlap in the matched high- and low-dosage control group samples is about 12 percent of the full control group, which is not substantially smaller than the 15 percent that would be expected if random matching were performed.

In sum, the goodness-of-fit tests based on the logit regression results yield mixed results about the success of the propensity scoring procedure, but on the whole, are disappointing. On the positive side, the parameter estimates on the explanatory variables are jointly significant. Furthermore, the matching method yielded program and matched control group families with similar observable characteristics within each service intensity group. However, the pseudo-R^2 values from the logit models are low (about .12); many program group families were misclassified to the high- and low-dosage groups using the cutoff method, and only slightly more than half of control group families were matched to program group families using the matching method. In addition, many of the parameters in the logit models are not statistically significant.

The results from the goodness-of-fit tests based on the outcome measures are also mixed. Table D.7C displays test results for the matching method where mean outcomes for the full control group are compared to the weighted averages of the mean outcomes for the matched controls in the low- and high-dosage groups. We find that, as expected, the mean outcomes of matched controls in the high-dosage group usually were more favorable than for those in the low-dosage group, because, as discussed, those in the high-dosage group were somewhat less disadvantaged. The differences between the full control group mean outcomes and the weighted averages of the mean outcomes for the two dosage groups usually are small in nominal terms,

TABLE D.7C

MEAN OUTCOMES OF MATCHED CONTROL GROUP FAMILIES AND THE FULL CONTROL GROUP, BY SERVICE INTENSITY LEVEL (USING THE PSI MEASURE)

Variable	High-Service Intensity Controls (1)	Low-Service Intensity Controls (2)	Weighted Average of (1) and (2) (3)	Full Control Group (4)	Error {(3)-(4)} as a Percent of the Impact on the Outcome
Bayley Mental Development Index (MDI)	92.02	89.36	90.46	90.16	28
Percentage with Bayley MDI Below 85	29.65	34.07	32.24	31.55	-24
PSI: Parental Distress	25.80	25.09	25.39	25.55	-50
Center for Epidemiologic Studies Depression Scale (CES-D) Total Score	8.13	7.47	7.74	7.91	-46
Percentage of Parents Who Spanked the Child in the Previous Week	52.11	51.37	51.68	53.44	-30
Index of Severity of Discipline Strategies	3.29	3.55	3.44	3.47	-27
Percentage of Parents Suggesting Only Mild Responses to Hypothetical Situations	48.70	39.65	43.40	41.97	33
Percentage of Parents Who Read to Their Child Every Day	53.23	49.91	51.29	51.80	14
Home Observation for Measurement of the Environment (HOME): Total Score	26.64	26.36	26.48	26.93	90
HOME: Support of Language and Learning	10.05	10.16	10.12	10.35	100
HOME: Warmth	2.36	2.44	2.41	2.48	100
Parent Supportiveness (Semistructured Play)	3.89	3.78	3.82	3.87	63
Parent Intrusiveness (Semistructured Play)	1.76	1.58	1.66	1.59	NA
Parent Detachment (Semistructured Play)	1.32	1.31	1.32	1.25	-350

TABLE D.7C (*continued*)

Variable	High-Service Intensity Controls (1)	Low-Service Intensity Controls (2)	Weighted Average of (1) and (2) (3)	Full Control Group (4)	Error {(3)-(4)} as a Percent of the Impact on the Outcome
Parent Engagement (Semistructured Play)	4.54	4.60	4.57	4.63	50
Sustained Attention with Objects (Semistructured Play)	4.73	4.74	4.74	4.83	90
Negativity Toward Parent (Semistructured Play)	1.48	1.30	1.38	1.31	-117
Persistence (Puzzle Challenge Task)	4.58	4.46	4.51	4.55	-400
Child Behavior Checklist: Aggressive Behavior	11.17	11.26	11.22	11.30	-25
Peabody Picture Vocabulary Test (PPVT-III) Standard Score	83.89	82.16	82.88	82.49	27
Percentage with PPVT <85	51.40	56.15	54.18	53.27	-26
Percentage of Caregivers Ever Employed During the 26 Months After Random Assignment	81.73	82.34	82.09	83.04	35
Percentage of Caregivers Ever in an Education or Training Program During the 26 Months After Random Assignment	54.06	51.00	52.27	50.25	25
Average Parent-Reported Health Status of Child	4.07	4.09	4.08	4.02	-600
Continuous Biological Father Presence Child Age 14 to 36 Months	75.00	67.06	70.35	70.25	-3
Continuous Male Presence Child Age 14 to 36 Months	90.61	81.34	85.18	84.89	-7
Sample Size	**324**	**668**		**1,011**	

TABLE D.7C (*continued*)

SOURCE: PSI and PI Data and Bayley and Video Assessments at 36 Months.

NOTE: Controls were matched to program group families with replacement using the propensity scoring approach (matching method) described in the text.

NA = Not applicable because the impact was zero for the outcome variable.

but are often large relative to the estimated full sample *impacts* on the outcomes. This suggests that the estimates of dosage effects may be biased. We find similar results when the mean outcomes of program group families predicted to be in a particular dosage group using the cutoff method are compared to the mean outcomes of program group families who were actually in that dosage group (see Table D.7D).

b. Impact Results

The impact results using the matching method strongly suggest that service intensity matters (Tables D.7E and D.7F). Across a wide range of outcome variables, the estimated impacts are more beneficial for those in the high dosage group than for those in the low dosage group. For example, the impact on the Bayley MDI was 2.35 points and statistically significant at the 5 percent level for those in the high dosage group, but was only 0.39 points and statistically insignificant for those in the low dosage group. Similarly, the impact was more than 3 points on the PPVT for the high dosage group, but was small and statistically insignificant for those in the low dosage group. A similar pattern exists across other key child and family outcomes, and exists for both the PSI intensity measure and the program engagement measure. The results using the fixed effects method support the findings using the matching method for some outcomes.

The findings using the cutoff method, however, do *not* support the conclusion that program impacts were larger for those families who received intensive services than for families who received less intensive or no services. There is no evidence that the estimated impacts using the cutoff method were systematically larger for those in the high dosage group than for those in the low dosage group for either the PSI or program engagement measure.

In sum, it is unclear whether impacts for the full sample are concentrated in those families who received substantial amounts of Early Head Start services. We do find evidence of dosage effects using one version of the propensity scoring approach (the matching method), but do not

TABLE D.7D

COMPARING THE MEAN OUTCOMES OF PROGRAM GROUP FAMILIES PREDICTED TO BE IN A SERVICE INTENSITY GROUP TO THE MEAN OUTCOMES OF THOSE ACTUALLY IN THAT GROUP (USING THE CUTOFF METHOD AND THE PSI MEASURE)

	High-Service Intensity Group		Low-Service Intensity Group		
Variable	Predicted	Actual	Predicted	Actual	Full Program Group
Bayley Mental Development Index (MDI)	94.14	93.08	89.92	90.27	91.25
Percentage with Bayley MDI Below 85	20.18	22.62	32.66	31.99	28.73
PSI: Parental Distress	25.12	24.69	25.29	25.51	25.23
Center for Epidemiologic Studies Depression Scale (CES-D) Total Score	7.76	7.26	7.42	7.67	7.53
Percentage of Parents Who Spanked the Child in the Previous Week	37.33	40.68	52.68	51.04	47.53
Index of Severity of Discipline Strategies	2.95	3.09	3.57	3.50	3.36
Percentage of Parents Suggesting Only Mild Responses to Hypothetical Situations	57.38	53.11	38.45	40.40	44.69
Percentage of Parents Who Read to Their Child Every Day	60.48	61.02	52.93	52.61	55.41
Home Observation for Measurement of the Environment (HOME): Total Score	28.00	27.97	27.14	27.13	27.42
HOME: Support of Language and Learning	10.83	10.78	10.46	10.48	10.58
HOME: Warmth	2.53	2.55	2.56	2.56	2.55
Parent Supportiveness (Semistructured Play)	4.11	4.05	3.87	3.89	3.95
Parent Intrusiveness (Semistructured Play)	1.44	1.53	1.67	1.63	1.60
Parent Detachment (Semistructured Play)	1.21	1.27	1.24	1.21	1.23

TABLE D.7D (*continued*)

Variable	High-Service Intensity Group		Low-Service Intensity Group		Full Program Group
	Predicted	Actual	Predicted	Actual	
Parent Engagement (Semistructured Play)	4.90	4.83	4.68	4.72	4.75
Sustained Attention with Objects (Semistructured Play)	5.08	5.07	4.84	4.84	4.92
Negativity Toward Parent (Semistructured Play)	1.19	1.28	1.29	1.25	1.26
Persistence (Puzzle Challenge Task)	4.77	4.78	4.43	4.41	4.54
Child Behavior Checklist: Aggressive Behavior	11.60	10.75	10.68	11.10	10.98
Peabody Picture Vocabulary Test (PPVT-III) Standard Score	86.00	86.06	82.77	82.61	83.90
Percentage with PPVT <85	44.44	44.59	52.62	52.85	49.76
Percentage of Caregivers Ever Employed During the 26 Months After Random Assignment	85.45	87.35	85.93	85.01	85.77
Percentage of Caregivers Ever in an Education or Training Program During the 26 Months After Random Assignment	57.99	58.31	58.66	58.51	58.44
Average Parent-Reported Health Status of Child	4.06	4.03	3.99	4.01	4.01
Continuous Biological Father Presence Child Age 14 to 36 Months	70.35	69.46	64.87	65.22	66.77
Continuous Male Presence Child Age 14 to 36 Months	80.43	84.52	80.48	78.13	80.46
Sample Size	**324**	**324**	**668**	**668**	**992**

SOURCE: PSI and PI Data and Bayley and Video Assessments at 36 Months.

NOTE: Analysis was conducted using program group families only. Families were predicted to be in the high- or low-service intensity group on the basis of the size of their propensity scores and using the cutoff method described in the text.

TABLE D.7E

IMPACT ESTIMATES FOR THE HIGH AND LOW DOSAGE GROUPS USING THE SELF-REPORTED PSI INTENSITY MEASURE, BY ESTIMATION METHOD

Variable	Impact for the Full Sample[a]	Matching Method			Cutoff Method			Fixed-Effects Method
		High Dosage Group	Low Dosage Group	Difference	High Dosage Group	Low Dosage Group	Difference	Average Difference Between the High and Low Dosage Groups[b]
Bayley Mental Development Index (MDI)	1.53**	0.95	0.72	0.23	0.72	1.76**	-1.04	0.22
Percentage with Bayley MDI Below 85	-4.19*	-6.76	-0.73	-6.03	-3.59	-4.83*	1.24	NA
PSI: Parental Distress	-0.40	-1.32*	-0.03	-1.29	-1.52*	-0.09	-1.43	-0.48
Center for Epidemiologic Studies Depression Scale (CES-D) Total Score	-0.38	-1.20**	0.02	-1.23*	-1.19*	-0.11	-1.07	NA
Percentage of Parents Who Spanked the Child in the Previous Week	-6.07**	-10.87***	-1.70	-9.17*	-6.59	-5.55*	-1.04	NA
Index of Severity of Discipline Strategies	-0.13*	-0.19	-0.06	-0.13	-0.02	-0.14*	0.12	NA
Percentage of Parents Suggesting Only Mild Responses to Hypothetical Situations	2.91	2.98	1.42	1.56	-1.57	3.69	-5.26	NA
Percentage of Parents Who Read to Their Child Every Day	4.16*	7.23*	4.06	3.17	3.48	5.31*	-1.83	NA
Home Observation for Measurement of the Environment (HOME): Total Score	0.39*	0.99***	0.82***	0.16	0.18	0.49*	-0.31	0.38
HOME: Support of Language and Learning	0.20**	0.53***	0.30***	0.23	0.17	0.19*	-0.02	0.11
HOME: Warmth	0.06	0.18**	0.11**	0.17	0.07	0.06	0.01	NA
Parent Supportiveness (Semistructured Play)	0.08*	0.11	0.14**	-0.03	0.11	0.07	0.03	-0.04
Parent Intrusiveness (Semistructured Play)	-0.01	-0.22***	0.07	-0.28***	-0.11	0.05	-0.16*	0.05
Parent Detachment (Semistructured Play)	-0.02	-0.06	-0.10**	0.04	0.05	-0.05	0.09	0.12**

TABLE D.7E (*continued*)

Variable	Impact for the Full Sample[a]	Matching Method			Cutoff Method			Fixed-Effects Method
		High Dosage Group	Low Dosage Group	Difference	High Dosage Group	Low Dosage Group	Difference	Average Difference Between the High and Low Dosage Groups[b]
Parent Engagement (Semistructured Play)	0.14**	0.31***	0.14**	0.17	0.20*	0.12*	0.08	-0.06
Sustained Attention with Objects (Semistructured Play)	0.10**	0.20**	0.11*	0.09	0.09	0.09	0.00	0.07
Negativity Toward Parent (Semistructured Play)	-0.07**	-0.24***	-0.06	-0.18**	-0.13**	-0.03	-0.10	0.09
Persistence (Puzzle Challenge Task)	0.01	0.27***	-0.07	0.34**	0.03	0.00	0.03	NA
Child Behavior Checklist: Aggressive Behavior	-0.38	-0.46	-0.36	-0.10	-0.06	-0.62	0.56	NA
Peabody Picture Vocabulary Test (PPVT-III) Standard Score	1.68**	2.91**	0.84	2.08	1.64	1.84*	-0.20	NA
Percentage with PPVT <85	-4.16	-9.43*	-3.21	-6.21	-4.37	-4.07	-0.30	NA
Percentage of Caregivers Ever Employed During the 26 Months After Random Assignment	2.77*	6.40**	2.33	4.07	1.03	3.63*	-2.60	NA
Percentage of Caregivers Ever in an Education or Training Program During the 26 Months After Random Assignment	7.48***	6.53*	8.86***	-2.33	7.97**	7.09***	0.89	NA
Average Parent-Reported Health Status of Child	-0.01	-0.05	-0.07	0.01	0.02	-0.03	0.04	NA
Continuous Biological Father Presence Child Age 14 to 36 Months	-1.68	-6.45	0.41	-6.86	-4.85	-0.20	-4.65	NA
Continuous Male Presence Child Age 14 to 36 Months	-3.74*	-5.88*	-2.71	-3.18	-0.64	-10.58**	-10.58**	NA

TABLE D.7E (*continued*)

SOURCE: PSI and PI data and Bayley and Video Assessments at 36 Months.

NOTE: See text for a discussion of the three estimation approaches. All impacts are estimated using regression models where sites are weighted by their sample sizes.

[a]Program group members who have missing values for the service intensity measure are excluded from the analysis, because these families were excluded from the analyses using the matching and cutoff methods.

[b]Sample includes those who had available data at 14 and 36 months.

NA = Not applicable

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.7F

IMPACT ESTIMATES FOR THE HIGH AND LOW DOSAGE GROUPS USING THE PROGRAM ENGAGEMENT MEASURE, BY ESTIMATION METHOD

Variable	Impact for the Full Sample[a]	Matching Method			Cutoff Method			Fixed-Effects Method
		High Dosage Group	Low Dosage Group	Difference	High Dosage Group	Low Dosage Group	Difference	Average Difference Between the High and Low Dosage Groups[b]
Bayley Mental Development Index (MDI)	1.74***	2.35**	0.39	1.95	1.40	1.85**	-0.45	1.84*
Bayley Language Factor	0.61***	0.72***	0.33*	0.39	-.87***	0.44**	0.43	NA
PSI: Parental Distress	-0.40	-0.74	-0.37	-0.38	-0.04	-0.61	0.58	-.07
Center for Epidemiologic Studies Depression Scale (CES-D) Total Score	-0.39	-0.85	-0.01	-0.84	0.15	-0.74*	0.89	NA
Percentage of Parents Who Spanked the Child in the Previous Week	-5.67**	-10.37***	-4.10	-6.27	-5.66	-6.61**	0.95	NA
Index of Severity of Discipline Strategies	-0.15**	-0.25**	-0.17*	-0.08	-0.09	-0.19**	0.10	NA
Percentage of Parents Suggesting Only Mild Responses to Hypothetical Situations	3.56*	6.08*	6.90**	-0.83	0.96	4.94*	-3.98	NA
Percentage of Parents Who Read to Their Child Every Day	5.66**	10.57***	1.47	9.09*	8.23**	4.10	4.13	NA
Home Observation for Measurement of the Environment (HOME): Total Score	0.52**	1.37***	0.19	1.17***	0.69**	0.47*	0.23	0.62*
HOME: Support of Language and Learning	0.23**	0.36**	0.16	0.20	0.25*	0.23*	0.03	.43***
HOME: Warmth	0.09**	0.16***	0.04	0.12	0.06	0.11**	-0.05	NA
Parent Supportiveness (Semistructured Play)	0.10**	0.13	0.00	0.12	0.11	0.10	0.01	0.17**
Parent Intrusiveness (Semistructured Play)	-0.02	-0.06	0.15***	-0.22***	-0.12*	0.06	-0.18**	-0.09
Parent Detachment (Semistructured Play)	-0.01	-0.02	-0.05	0.03	0.00	-0.02	0.02	-0.04
Parent Engagement (Semistructured Play)	0.15***	0.12	0.11	0.01	0.15*	0.17**	-0.02	0.16*

TABLE D.7F (*continued*)

Variable	Impact for the Full Sample[a]	Matching Method			Cutoff Method			Fixed-Effects Method
		High Dosage Group	Low Dosage Group	Difference	High Dosage Group	Low Dosage Group	Difference	Average Difference Between the High and Low Dosage Groups[b]
Sustained Attention with Objects (Semistructured Play)	0.13***	0.04	0.09	-0.05	0.12	0.14**	-0.03	0.09
Negativity Toward Parent (Semistructured Play)	-0.08**	-0.06	-0.03	-0.03	-0.07*	-0.07	-0.01	-0.04
Persistence (Puzzle Challenge Task)	0.01	0.07	0.00	0.07	-0.03	0.03	-0.06	NA
Child Behavior Checklist: Aggressive Behavior	-0.33	-0.25	-0.57	0.32	-0.28	-0.56	0.28	NA
Peabody Picture Vocabulary Test (PPVT-III) Standard Score	1.66**	3.15**	-0.56	3.71**	2.54*	1.35	1.19	NA
Percentage with PPVT <85	-4.08	-11.01**	4.23	-15.25***	-3.34	-5.17	1.83	NA
Percentage of Caregivers Ever Employed During the 26 Months After Random Assignment	2.45	4.06	3.39	0.67	4.44*	0.80	3.64	NA
Percentage of Caregivers Ever in an Education or Training Program During the 26 Months After Random Assignment	7.55***	3.07	4.05	-0.98	7.35**	6.79***	0.56	NA
Average Parent-Reported Health Status of Child	0.00	0.06	0.13**	-0.07	-0.09	0.04	-0.13	NA
Continuous Biological Father Presence Child Age 14 to 36 Months	-1.09	3.68	-5.67*	9.35*	0.24	-2.55	2.78	NA
Continuous Male Presence Child Age 14 to 36 Months	-3.74*	-2.58	-7.49*	4.91	-2.28	-4.93*	2.65	NA

TABLE D.7F (*continued*)

SOURCE: PSI and PI data and Bayley and Video Assessments at 36 Months.

NOTE: See text for a discussion of the three estimation approaches. All impacts are estimated using regression models where sites are weighted by their sample sizes.

[a]Program group members who have missing values for the service intensity measure are excluded from the analysis, because these families were excluded from the analyses using the matching and cutoff methods.

[b]Sample includes those who had available data at 14 and 36 months.

NA = Not applicable

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

find this evidence using another version of this approach (the cutoff method). Furthermore, the goodness-of-fit statistics for the propensity scoring approach provide mixed—but, on the whole, disappointing—results about the success of this method for generating unbiased estimates of dosage effects. In short, it is very difficult to model service intensity on the basis of the available baseline data. Thus, we believe that the findings of dosage effects using the matching method are open to question.

D.8 RESULTS FROM RERUN OF 24-MONTH CHILD AND FAMILY OUTCOMES

Data on child and family outcomes based on the 24-Month Parent Interview were not complete at the time the Early Head Start interim report was written. Approximately 100 records from a number of sites were added to the sample after publication of the interim report. To ensure consistency of results, we reanalyzed the impact of Early Head Start programs on child and family outcomes at 24 months using this slightly augmented sample. The results of those analyses are consistent with the findings presented in the interim report, as summarized here.

1. Early Head Start Impacts for the Entire Sample

There were no dramatic changes in the impact of Early Head Start programs on the entire sample. Results are detailed in Tables D.8A through D.8H. Some of the smaller changes are:

- Some effects sizes for child cognitive outcomes (the Bayley MDI and MacArthur vocabulary and sentence complexity) became slightly larger and more statistically significant (Table D.8A). Early Head Start children scored higher than control children on these measures.
- The effect size for parent supportiveness in parent-child semistructured play became slightly smaller, and the statistical significance dropped to the .10 level (Table D.8C).
- The effect sizes for several "discipline strategy" variables became somewhat larger, and many became significant at the .05 and .01 levels (Tables D.8E and D.8F). This reinforces the pattern shown in the interim report, which showed that Early Head Start parents were more likely to suggest mild discipline and less likely to suggest severe discipline strategies.

2. Early Head Start Program Impacts by Program Approach

Tables D.8I through D.8L show the results of the analyses by program approach. Once again, there were no major differences compared with the results reported in the interim report. Some of the smaller changes are:

- Some effect sizes for child cognitive outcomes (the Bayley MDI and MacArthur vocabulary and sentence complexity) became slightly larger and more statistically

significant. The impact of Early Head Start on these cognitive and language development measures was still found largely in center-based and mixed-approach programs (Table D.8I).

- Early Head Start programs had positive impacts on a number of child language and social-emotional development outcomes in home-based and mixed-approach programs, just as reported in the interim report (Table D.8I).
- In this reanalysis, Early Head Start programs still showed positive impacts on many parenting behaviors in home-based and mixed-approach programs (Table D.8J). The positive impacts on the HOME language environment and the reduction of parent detachment both were slightly more robust with the full sample (statistical significance rises to the .05 level) in the home-based programs.
- There were minor changes in the statistical significance of the impact of Early Head Start on parenting behavior in mixed-approach programs, but effect sizes remained the same (Table D.8J).
- The impact of Early Head Start on suggesting mild discipline strategies in center-based programs became larger and statistically significant at the .05 level. The impact on knowledge of infant development in home-based programs also became more robust (Table D.8K).
- There were generally no changes in the magnitude of Early Head Start impacts on family health and functioning. However, the reduction in parental distress and family conflict in home-based programs became significant at the .10 level (Table D.8L).

3. Early Head Start Program Impacts by Programs' Implementation Pattern

Tables D.8M through D.8P show the results of the analyses by the implementation pattern of programs. Once again, there were no major changes from the results reported in the interim report. Some of the smaller changes were:

- The only change in child cognitive and language development was that the impact on the MacArthur combining word score became more robust, increasing to the .05 level for early implemented programs (Table D.8M).
- The most notable change in child social-emotional development was the negative impact of the Bayley Emotional Regulation measure; it became statistically significant at the .05 level for incompletely implemented programs (Table D.8M).
- There were no notable changes in the magnitude of the impacts of Early Head Start on parenting behavior, although some impacts became slightly more and some slightly less robust (Table D.8N).

TABLE D.8A

IMPACTS ON COGNITIVE AND LANGUAGE DEVELOPMENT

Outcome	Program Group Participants[a]	Control Group[b]	Estimated Impact Per Participant[c]	Effect Size[d]
Cognitive Development				
Bayley Mental Development Index (MDI)	90.1	88.0	2.1***	15.6
Percent with Bayley MDI Below 100	75.2	79.7	-4.5**	-11.0
Percent with Bayley MDI Below 85	33.8	40.8	-6.9***	-14.2
Language Development				
MacArthur Communicative Development Inventory (CDI): Vocabulary Production Score	56.5	53.9	2.6**	11.7
MacArthur CDI: Percent Combining Words	81.0	77.9	3.1*	7.5
MacArthur CDI: Sentence Complexity Score	8.8	7.7	1.1**	13.4
Sample Size				
Parent Interview	**1,118**	**1,048**	**2,166**	
Bayley	**931**	**850**	**1,781**	

SOURCE: Parent interview and child assessments conducted when children were approximately 24 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities.

[b]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean was estimated as the difference between the program group mean for participants and the impact per participant.

[c]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[d]The effect size was calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

*Significantly different from zero at the .10 level, two-tailed test
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8B

IMPACTS ON SOCIAL-EMOTIONAL DEVELOPMENT FOR THE FULL SAMPLE

Outcome	Program Group Participants[a]	Control Group[b]	Estimated Impact Per Participant[c]	Effect Size[d]
Parent-Child Structured Play: Engagement of Parent[e]	4.3	4.2	0.1*	8.7
Parent-Child Structured Play: Negativity toward Parent[e]	1.7	1.8	-0.1	-7.1
Parent-Child Structured Play: Sustained Attention with Objects[e]	5.0	5.0	0.1	7.1
Bayley Behavior Rating Scale (BRS): Emotional Regulation in a Cognitive Task (average score)[f]	3.6	3.6	-0.0	-1.6
Bayley Behavior Rating Scale (BRS): Orientation/ Engagement in a Cognitive Task (average score)[f]	3.7	3.7	0.0	0.0
Child Behavior Checklist: Aggressive Behavior Problems (average score)	9.9	10.4	-0.5*	-9.0
Sample Size	**1,118**	**1,048**	**2,166**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semi-structured parent-child interactions conducted when children were approximately 24 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities.

[b]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean was estimated as the difference between the program group mean for participants and the impact per participant.

[c]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[d]The effect size was calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

[e]Behaviors are observed during the videotaped Parent-Child Structured Play task and coded on a seven-point scale.

[f]Behaviors are observed during the Bayley assessment and rated on a five-point scale by the Interviewer/Assessor.

*Significantly different from zero at the .10 level, two-tailed test
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8C

IMPACTS ON EMOTIONAL SUPPORT

Outcome	Program Group Participants[a]	Control Group[b]	Estimated Impact Per Participant[c]	Effect Size[d]
Home Observation for Measurement of the Environment (HOME): Emotional Responsivity[e]	6.2	6.1	0.1*	8.6
Parent-Child Structured Play: Supportiveness[f]	4.1	4.0	0.1*	8.9
Sample Size				
Parent Interview	**1,118**	**1,048**	**2,166**	
Parent-Child Interactions	**941**	**855**	**1,796**	

SOURCE: Parent interviews and assessments of semi-structured parent-child interactions conducted when children were approximately 24 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities.

[b]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean was estimated as the difference between the program group mean for participants and the impact per participant.

[c]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[d]The effect size was calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

[e]Behaviors are observed during the HOME assessment and rated on a yes/no scale by the Interviewer/Assessor.

[f]Behaviors are observed during the videotaped parent-child structured play task and coded on a seven-point scale.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8D

IMPACTS ON THE HOME ENVIRONMENT AND STIMULATION OF LANGUAGE AND LEARNING

Outcome	Program Group Participants[a]	Control Group[b]	Estimated Impact Per Participant[c]	Effect Size[d]
Home Observation for Measurement of the Environment (HOME) – Total Score	26.5	26.1	0.4***	11.1
Structuring the Environment				
HOME: Support of Cognitive, Language, and Literacy Environment	10.3	10.1	0.2***	12.7
Percentage of Parents Who Set a Regular Bedtime for Child	61.5	55.6	5.8**	11.6
Percentage of Parents and Children Who Have Regular Bedtime Routines	68.8	66.6	2.3	4.8
Parent-Child Activities				
Parent-Child Activities	4.6	4.5	0.1**	10.6
Percentage of Parents Who Read to Child Every Day	58.0	52.0	5.9**	11.9
Percentage of Parents Who Read to Child at Bedtime	29.0	22.5	6.5***	15.3
Parent's Verbal-Social Skills				
HOME: Maternal Verbal-Social Skills[e]	2.8	2.7	0.0	6.5
Sample Size				
Parent Interview	**1,118**	**1,048**	**2,166**	
Parent-Child Interactions	**941**	**855**	**1,796**	

SOURCE: Parent interviews, interviewer observations, and assessments of semi-structured parent-child interactions conducted when children were approximately 24 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities.

[b]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean was estimated as the difference between the program group mean for participants and the impact per participant.

[c]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[d]The effect size was calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

[e]Behaviors are observed during the HOME assessment and rated on a yes/no scale by the Interviewer/Assessor.

*Significantly different from zero at the .10 level, two-tailed test
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8E

IMPACTS ON NEGATIVE PARENTING BEHAVIOR
IN STRUCTURED PLAY AND INTERACTION

Outcome	Program Group Participants[a]	Control Group[b]	Estimated Impact Per Participant[c]	Effect Size[d]
Insensitivity				
Parent-Child Structured Play: Detachment[e]	1.4	1.5	-0.1**	-10.2
Parent-Child Structured Play: Intrusiveness[e]	1.9	1.9	0.0	-4.3
Hostility and Punishment				
Parent-Child Structured Play: Negative Regard[e]	1.5	1.5	0.0	1.8
Home Observation for Measurement of the Environment (HOME): Absence of Punitive Interactions[f]	4.4	4.4	-0.1	-4.0
Percentage of Parents who Spanked the Child in the Previous Week	47.2	52.8	-5.6**	-11.2
Sample Size				
Parent Interview	**1,118**	**1,048**	**2,168**	
Parent-Child Interactions	**941**	**855**	**1,796**	

SOURCE: Parent interviews, interviewer observations, and assessments of semi-structured parent-child interactions conducted when children were approximately 24 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities.

[b]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean was estimated as the difference between the program group mean for participants and the impact per participant.

[c]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[d]The effect size was calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

[e]Behaviors are observed during the videotaped parent-child structured play task and coded on a seven-point scale.

[f]Behaviors are observed during the HOME assessment and rated on a yes/no scale by the Interviewer/Assessor.

*Significantly different from zero at the .10 level, two-tailed test
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8F

IMPACTS ON PARENTING KNOWLEDGE:
CHILD DEVELOPMENT AND DISCIPLINE STRATEGIES

Outcome	Program Group Participants[a]	Control Group[b]	Estimated Impact Per Participant[c]	Effect Size[d]
Knowledge o Child Development				
Knowledge of Infant Development Inventory (KIDI)	3.4	3.3	0.1***	12.7
Discipline Strategies				
Percentage of Parents Who Suggested Responses to Hypothetical Situations with Child:				
Prevent or Distract	72.8	67.4	5.5**	11.7
Remove Child or Object	80.4	81.7	-1.4	-3.5
Talk and Explain	37.8	31.1	6.7***	14.3
Threaten or Command	32.1	34.3	-2.2	-4.6
Shout	5.8	5.1	0.7	3.4
Physical Punishment	27.1	30.5	-3.4*	-7.4
Percentage of Parents Suggesting Only Mild Responses to the Hypothetical Situations[e]	43.1	38.2	4.9**	10.0
Index of Severity of Discipline Strategies Suggested[f]	2.7	2.8	-0.2**	-9.0
Sample Size	**1,118**	**1,048**	**2,166**	

SOURCE: Parent interviews conducted when children were approximately 24 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities.

[b]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean was estimated as the difference between the program group mean for participants and the impact per participant.

[c]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[d]The effect size was calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

[e]Parents were classified as suggesting only mild discipline if their responses to the three discipline situations include only the following: prevent or distract, remove child or object, or talk and explain.

TABLE D.8F *(continued)*

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[f]The Index of Severity of Discipline Strategies is based on a hierarchy of discipline practices from talk and explain or prevent/distract (1) through physical punishment (5). The most severe approach suggested is used to code this scale.

*Significantly different from zero at the .10 level, two-tailed test
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8G

IMPACTS ON SAFETY PRACTICES
(Percentages)

Outcome	Program Group Participants[a]	Control Group[b]	Estimated Impact Per Participant[c]	Effect Size[d]
Family Has Syrup of Ipecac in the House in Case of a Poison Emergency	29.9	29.6	0.3	0.6
Parent/Guardian Has or Knows How to Find the Telephone Number For the Poison Control Center	38.2	36.0	2.2	4.5
Family Uses a Gate or Door at the Top of Stairs	79.0	80.9	-1.8	-3.8
Family Uses Guards or Gates For Windows	63.0	64.8	-1.8	-3.8
Family Has Covers on Electrical Outlets That Child Can Reach	60.6	60.7	-0.1	-0.2
Family's Homes Has Working Smoke Alarms	87.1	84.8	2.3	6.2
Family Uses a Car Seat For Child and it is in the Back Seat of the Car	80.8	82.0	-1.2	-3.1
Interviewer Observed That Child's Play Area is Safe	69.2	68.8	0.3	0.7
Sample Size	**1,118**	**1,048**	**2,166**	

SOURCE: Parent interviews and interviewer observations conducted when children were approximately 24 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities.

[b]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean was estimated as the difference between the program group mean for participants and the impact per participant.

[c]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[d]The effect size was calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

*Significantly different from zero at the .10 level, two-tailed test
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8H

IMPACTS ON PARENT HEALTH AND FAMILY FUNCTIONING

Outcome	Program Group Participants[a]	Control Group[b]	Estimated Impact Per Participant[c]	Effect Size[d]
Parent's Physical Health				
Parent's Health Status	3.5	3.5	0.0	2.7
Parent's Mental Health				
Parental Distress	24.8	26.0	-1.2**	-12.2
Parent-Child Dysfunctional Interaction	16.9	17.4	-0.5*	-8.7
CIDI-Depression–Average Probability	12.1	12.1	0.0	1.0
Family Functioning				
Family Environment Scale–Family Conflict (Average Score)	1.7	1.7	-0.1**	-10.3
Sample Size	**1,118**	**1,048**	**2,166**	

SOURCE: Parent interviews conducted when children were approximately 24 months old.

NOTE: All impact estimates were calculated using regression models, where each site was weighted equally.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities.

[b]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean was estimated as the difference between the program group mean for participants and the impact per participant.

[c]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for all program and control group members.

[d]The effect size was calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact expressed as a percentage of the standard deviation).

*Significantly different from zero at the .10 level, two-tailed test
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8I

IMPACTS ON CHILD OUTCOMES AT AGE 2, BY PROGRAM APPROACH IN 1997

	Center-Based					Home-Based Programs					Mixed-Approach Programs			
Outcome	Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]		Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]		Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]
Child Cognitive Development														
Average Bayley Mental Development Index (MDI)	90.1	87.1	3.1**	22.9		91.6	90.4	1.1	8.4		88.2	86.9	1.4	10.1
Percentage with MDI < 85***[d]	31.4	43.6	-12.2*	-25.0		31.4	32.7	-1.3	-2.7		37.9	44.8	-6.9	-14.1
Percentage with MDI < 100	75.4	84.1	-8.2*	-20.1		73.1	72.2	1.0	2.4		77.3	79.8	-2.6	-6.3
Child Language Development														
Average MacArthur CDI—Vocabulary Production	55.0	55.0	-0.0	-0.2		56.5	53.3	3.1*	13.9		57.5	53.4	4.1**	18.3
Percentage with Vocabulary Production < 25***	11.0	12.7	-1.7	-5.2		11.4	11.2	0.3	0.8		5.4	8.4	-3.1	-9.6
Percent MacArthur CDI—Combining Words***	84.1	83.6	0.5	1.2		76.9	75.6	1.2	3.0		83.8	75.3	8.5***	20.2
Average MacArthur CDI—Sentence Complexity*	8.7	8.5	0.2	2.8		8.5	7.7	0.7	9.0		9.2	6.9	2.3***	28.5
Percentage with Sentence Complexity < 2***	29.1	25.7	3.4	7.4		28.7	30.4	-1.8	-3.9		22.7	31.4	-8.7**	-19.0
Child Social-Emotional Development														
Bayley BRS—Emotional Regulation	3.7	3.7	0.1	7.3		3.6	3.6	-0.1	-5.7		3.6	3.7	0.0	-4.9
Bayley BRS—Orientation/Engagement	3.7	3.7	-0.1	-7.7		3.6	3.6	0.0	1.2		3.7	3.7	0.0	-2.9
Child Behavior Checklist—Aggression	9.3	9.9	-0.6	-11.0		10.4	10.5	-0.2	-2.7		9.7	10.6	-0.9*	-16.0
Parent-Child Structured Play: Child Sustained Attention with Objects	5.0	5.1	-0.1	-8.1		5.1	5.0	0.0	4.2		5.1	4.9	0.2*	17.6
Parent-Child Structured Play: Child Negativity Toward Parent	1.8	1.7	0.1	-7.1		1.7	1.7	-0.0	-4.3		1.8	2.0	-0.2*	-18.8
Parent-Child Structured Play: Child Engagement	4.4	4.4	-0.1	-3.9		4.3	4.3	0.0	3.7		4.3	4.0	0.3**	21.5
Sample Size														
Parent Interview	**240**	**203**	**443**			**500**	**466**	**966**			**352**	**352**	**704**	
Bayley	**217**	**181**	**398**			**432**	**387**	**819**			**282**	**282**	**564**	
Parent-Child Interactions	**236**	**195**	**431**			**429**	**374**	**803**			**276**	**286**	**562**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semi-structured parent-child interactions conducted when children were approximately 24 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

TABLE D.8I *(continued)*

[a]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant. A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based services, and/or participated in Early Head Start parent-child group activities.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8J

IMPACTS ON PARENTING BEHAVIOR AT AGE 2, BY PROGRAM APPROACH IN 1997

	Center-Based Programs				Home-Based Programs				Mixed-Approach Programs			
Outcome	Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]	Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]	Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]
Quality of the Home Environment and Parenting: Emotional Support												
Home Observation for Measurement of the Environment (HOME) Emotional Responsivity	5.9	5.9	-0.0	-2.4	6.5	6.4	0.1*	9.5	6.0	5.9	0.2	10.6
Parent-Child Structured Play: Parent Supportiveness	4.0	4.0	-0.0	-4.0	4.1	4.0	0.1*	9.3	4.1	3.9	0.2**	19.3
Quality of the Home Environment and Parenting: Stimulation of Language and Learning												
HOME Total Score	26.1	26.2	-0.1	-3.1	26.9	26.4	0.5**	13.2	26.3	25.7	0.6**	17.4
HOME Support of Cognitive, Language, and Literacy Environment*[d]	10.2	10.2	-0.0	-1.6	10.3	10.1	0.2**	10.7	10.4	10.0	0.6***	21.3
Percentage of Parents who set a Regular Bedtime for Child***	65.9	57.6	8.3*	16.8	59.1	54.0	5.2	10.4	59.7	55.0	4.7	9.5
Percentage of Parents and Children Who have Regular Bedtime Routines***	70.1	67.5	2.6	5.5	69.6	65.4	4.2	9.0	66.4	65.9	0.5	1.0
Percentage of Parents Who Read to Child Daily***	56.7	49.2	7.5	15.0	55.8	54.3	1.5	3.1	60.7	48.3	12.4***	24.9
Percentage of Parents Who Read to Child as Part of Bedtime Routine***	29.3	21.1	8.2*	19.5	26.6	19.4	7.2**	17.1	30.0	25.5	4.5	10.7
Reading Frequency**	4.6	4.5	0.1	8.8	4.6	4.6	0.0	-1.1	4.7	4.3	0.4***	28.3
Parent-Child Activities to Stimulate Cognitive and Language Development	4.5	4.5	0.0	5.1	4.6	4.5	0.0	5.0	4.6	4.4	0.2***	23.3
HOME Maternal Verbal/Social Skills	2.7	2.8	-0.1	-8.7	2.9	2.9	0.0	5.1	2.7	2.6	0.1	14.5
Quality of the Home Environment and Parenting: Negative Parenting Behavior												
Parent-Child Structured Play: Parent Detachment	1.4	1.4	0.1	6.8	1.4	1.5	-0.2**	-16.8	1.4	1.5	-0.2*	-16.2
Parent-Child Structured Play: Parent Intrusiveness	2.0	1.9	0.1	12.6	1.8	1.9	-0.1	-9.0	1.9	2.0	-0.2*	-16.1
Parent-Child Structured Play: Negative Regard	1.5	1.4	0.1	9.4	1.4	1.5	-0.1	-5.6	1.4	1.4	0.0	1.8
HOME Absence of Punitive Interactions	4.5	4.5	-0.0	1.7	4.3	4.3	-0.0	-0.7	4.4	4.5	-0.1	-4.9
Spanked Child in Last Week***	52.1	57.0	-5.0	-9.9	48.6	52.5	-3.8	-7.7	43.9	52.2	-8.3**	-16.7
Sample Size												
Parent Interview	**240**	**203**	**443**		**500**	**466**	**966**		**352**	**352**	**704**	
Parent-Child Interactions	**236**	**195**	**431**		**429**	**374**	**803**		**276**	**286**	**562**	

SOURCE: Parent interviews and assessments of parent-child interactions during semi-structured tasks conducted when children were approximately 24 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

TABLE D.8.J *(continued)*

[a]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant. A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based services, and/or participated in Early Head Start parent-child group activities.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8K

IMPACTS ON PARENTING KNOWLEDGE AT AGE 2, BY PROGRAM APPROACH IN 1997

	Center-Based Programs					Home-Based Programs					Mixed-Approach Programs			
Outcome	Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]		Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]		Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]
Knowledge o Child Development														
Knowledge of Infant Development Inventory (KIDI)	3.4	3.4	0.0	-0.8		3.4	3.3	0.1***	17.2		3.4	3.4	0.1**	15.4
Discipline Strategies														
Percentage of Parents Who Suggested Responses to Hypothetical Conflicts with Child:														
Prevent or Distract***[d]	72.1	60.2	11.9**	25.5		69.7	66.8	2.9	6.2		77.0	72.3	4.7	9.9
Remove Child or Object***	78.7	83.6	-4.9	-12.7		78.6	80.6	-2.0	-5.1		83.4	82.3	1.1	2.4
Talk and Explain***	30.1	31.4	-1.3	-2.9		34.3	27.9	6.4**	13.7		47.7	32.6	15.0***	32.2
Threaten or Command***	34.9	49.1	-14.2**	-30.2		29.0	28.2	0.8	1.6		33.1	30.3	2.8	5.9
Shout***	5.8	6.5	-0.7	-3.2		5.9	4.0	1.9	8.8		5.8	4.5	1.2	5.7
Physical Punishment***	37.2	33.7	3.4	7.5		22.9	26.0	-3.1	-6.8		25.2	32.3	-7.1*	-15.4
Percentage of Parents Suggesting Only Mild Responses to the Hypothetical Conflicts***	36.7	26.0	10.7**	21.8		48.0	44.8	3.2	6.6		41.9	39.5	2.4	5.0
Index of Discipline Severity	3.0	3.1	-0.1	-8.1		2.5	2.6	-0.1	-6.6		2.6	2.8	-0.2	-10.4
Safety Practices														
Has Syrup of Ipecac at Home***	19.0	22.5	-3.5	-7.5		30.6	30.7	-0.1	-0.2		35.5	32.5	3.0	6.6
Has Poison Control Number***	34.2	36.0	-1.8	-3.7		36.7	36.6	0.1	0.1		42.5	36.2	6.3	13.0
Has Gates or Doors in Front of Stairs***	84.9	90.0	-5.1	-12.9		72.8	75.4	-2.6	-6.6		82.1	80.2	2.0	5.0
Uses Guards or Gates for Windows***	81.0	86.3	-5.4	-11.3		52.6	55.4	-2.8	-5.8		62.5	63.0	-0.5	-1.1
Covers Electric Outlets***	51.1	78.4	-19.8***	-40.3		61.0	57.2	3.5	7.2		65.9	60.1	5.9	11.9
Home has Working Smoke Alarm***	89.4	83.4	6.3	17.4		83.5	83.4	0.1	0.3		89.9	86.5	3.4	9.3
Uses a Car Seat***	75.6	81.8	-5.3	-16.5		81.3	80.8	0.5	1.3		83.9	84.5	-0.6	-1.5
Observed Child Play Area is Safe***	53.6	57.7	-4.2	-8.9		74.6	74.3	0.4	0.8		73.3	71.7	1.6	3.4
Sample Size	**256**	**222**	**478**			**505**	**467**	**972**			**353**	**353**	**706**	

SOURCE: Parent interviews and assessments of parent-child interactions conducted when children were approximately 24 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant. A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based services, and/or participated in Early Head Start parent-child group activities.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

TABLE D.8K *(continued)*

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8L

IMPACTS ON PARENT HEALTH AND FAMILY FUNCTIONING AT AGE 2, BY PROGRAM APPROACH IN 1997

	Center-Based Programs					Home-Based Programs						Mixed-Approach Programs		
Outcome	Program Group Participants[a]	Control Group[b]	Impact Estimate Per Participant[c]	Effect Size[d]		Program Group Participants[a]	Control Group[b]	Impact Estimate Per Participant[c]	Effect Size[d]		Program Group Participnts[a]	Control Group[b]	Impact Estimate Per Participant[c]	Effect Size[d]
Parent's Physical Health														
Overall Health Status	3.5	3.6	-0.1	-12.3		3.4	3.4	0.0	1.6		3.6	3.5	0.1	5.3
Parent's Mental Health														
Parenting Stress Index: Parental Distress	24.7	24.8	-0.1	-1.1		25.0	26.2	-1.1*	-13.8		24.7	26.9	-2.2***	-23.1
Parenting Stress Index: Parent-Child Dysfunctional Interaction	16.5	17.4	-0.8	-13.5		17.0	17.6	-0.6	-9.0		17.0	17.5	-0.5	-7.5
Composite International Diagnostic Interview (CIDI) Short Screening Scales: Major Depression (probability)	9.6	9.1	0.5	1.6		14.5	11.9	2.6	8.7		11.4	12.5	-1.0	-3.5
Family Functioning														
FES Family Conflict	1.7	1.7	0.0	-2.3		1.7	1.7	-0.1*	-13.6		1.7	1.7	0.0	-7.8
Sample Size	**256**	**222**	**478**			**507**	**467**	**972**			**353**	**353**	**706**	

SOURCE: Parent interviews, child assessments, and videotaped interactions conducted when children were approximately 24 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities.

[b]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant. A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based services, and/or participated in Early Head Start parent-child group activities.

[c]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[d]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[e]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8M

IMPACTS ON CHILD OUTCOMES AT AGE 2, BY PATTERN OF IMPLEMENTATION

	Early Implementers					Later Implementers					Incomplete Implementers			
Outcome	Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]		Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]		Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]
Child Cognitive Development														
Average Bayley Mental Development Index (MDI)	91.9	89.7	2.2*	16.2		86.3	84.1	2.2*	15.9		92.3	91.4	1.0	7.2
Percentage with MDI < 85***[d]	29.5	36.0	-6.5	-13.2		44.7	51.5	-6.9	-14.0		26.5	31.7	-5.1	-10.6
Percentage with MDI < 100***	67.7	72.3	-4.6	-11.2		84.3	90.8	-6.5**	-15.8		73.7	70.4	3.3	8.0
Child Language Development														
Average MacArthur CDI—Vocabulary Production	59.8	55.6	4.2**	18.6		52.9	51.7	1.2	5.4		56.8	54.1	2.7	11.9
Percentage with Vocabulary Production < 25***	7.5	8.8	-1.3	-4.0		12.1	13.9	-1.7	-5.4		8.0	9.5	-1.5	-4.7
Percent MacArthur CDI—Combining Words***	86.1	79.8	6.2**	14.9		71.7	70.5	1.2	2.8		86.6	84.8	1.8	4.4
Average MacArthur CDI—Sentence Complexity	9.9	8.3	1.6**	20.0		7.4	6.4	1.0	17.8		9.0	8.4	0.6	7.5
Percentage with Sentence Complexity < 2***	22.8	25.8	-3.0	-6.6		36.0	37.4	-1.4	-3.1		19.5	23.5	-4.0	-8.8
Child Social-Emotional Development														
Bayley BRS—Emotional Regulation*	3.8	3.7	0.1*	15.5		3.6	3.6	0.0	-1.4		3.5	3.6	-0.2**	-21.7
Bayley BRS—Orientation/Engagement	3.9	3.9	0.0	0.9		3.5	3.4	0.0	3.5		3.6	3.7	-0.1	-9.3
Child Behavior Checklist—Aggression	9.4	10.6	-1.2***	-22.2		10.5	10.5	-0.1	-0.9		9.7	10.2	-0.4	-7.9
Parent-Child Structured Play: Child Sustained Attention with Objects	5.2	5.0	0.2**	20.3		5.0	4.9	0.1	12.3		4.9	5.0	-0.1	-9.0
Parent-Child Structured Play: Child Negativity Toward Parent	1.6	1.8	-0.1*	-14.7		1.7	1.8	-0.1	-6.0		1.9	1.9	0.1	6.4
Parent-Child Structured Play: Child Engagement**	4.6	4.4	0.2**	19.1		4.3	4.1	0.2*	14.4		4.1	4.2	-0.2	-13.1
Sample Size														
Parent Interview	**381**	**352**	**733**			**417**	**391**	**808**			**294**	**278**	**572**	
Bayley	**332**	**303**	**635**			**333**	**292**	**625**			**266**	**255**	**521**	
Parent-Child Interactions	**324**	**302**	**626**			**366**	**321**	**687**			**251**	**232**	**483**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semi-structured parent-child interactions conducted when children were approximately 24 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

TABLE D.8M *(continued)*

[a]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant. A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based services, and/or participated in Early Head Start parent-child group activities.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8N

IMPACTS ON PARENTING BEHAVIOR AT AGE 2, BY PATTERN OF IMPLEMENTATION

	Early Implementers				Later Implementers				Incomplete Implementers			
Outcome	Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]	Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]	Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]
Quality of the Home Environment and Parenting: Emotional Support												
Home Observation for Measurement of the Environment (HOME) Emotional Responsivity	6.1	5.9	0.2	10.8	6.2	6.1	0.0	2.0	6.4	6.3	0.1	4.4
Parent-Child Structured Play: Parent Supportiveness	4.5	4.3	0.2**	18.6	3.9	3.8	0.1	7.1	3.8	3.9	-0.1	-7.5
Quality of the Home Environment and Parenting: Stimulation of Language and Learning												
HOME Total Score	27.1	26.5	0.7***	17.4	25.6	25.5	0.1	3.4	26.9	26.6	0.2	6.5
HOME Support of Cognitive, Language, and Literacy Environment	10.8	10.4	0.4***	20.5	9.8	9.7	0.0	1.4	10.5	10.2	0.2*	13.3
Percentage of Parents who set a Regular Bedtime for Child***[d]	66.1	60.8	5.4	10.8	55.7	50.5	5.2	6.5	62.8	57.2	5.6	11.3
Percentage of Parents and Children Who have Regular Bedtime Routines***	73.9	69.3	4.6	9.9	61.4	63.9	-2.6	-5.5	71.9	65.7	6.2	13.2
Percentage of Parents Who Read to Child Daily***	63.0	49.7	13.4***	26.7	49.7	45.7	4.0	8.1	62.3	59.0	3.2	6.5
Percentage of Parents Who Read to Child as Part of Bedtime Routine***	34.7	27.3	7.3*	17.4	19.0	15.5	3.5	8.3	35.1	21.2	13.9***	33.1
Reading Frequency*	4.8	4.5	0.3***	27.8	4.4	4.3	0.1	3.9	4.7	4.7	0.0	1.8
Parent-Child Activities to Stimulate Cognitive and Language Development	4.6	4.4	0.2***	20.2	4.5	44	0.1	9.1	4.6	4.6	0.0	0.2
HOME Maternal Verbal/Social Skills	2.8	2.7	0.1*	13.0	2.7	2.7	0.0	0.2	2.9	2.9	0.0	-1.3
Quality of the Home Environment and Parenting: Negative Parenting Behavior												
Parent-Child Structured Play: Parent Detachment	1.3	1.4	-0.1*	-12.7	1.4	1.6	-0.2**	-19.3	1.5	1.5	0.0	-4.2
Parent-Child Structured Play: Parent Intrusiveness	1.7	1.8	-0.1	-7.0	1.9	1.9	-0.1	-6.6	2.2	2.2	0.0	-1.9
Parent-Child Structured Play: Negative Regard	1.3	1.4	0.0	-3.3	1.5	1.4	0.0	1.3	1.6	1.6	0.0	5.1
HOME Absence of Punitive Interactions	4.5	4.5	0.0	0.6	4.3	4.4	-0.1	-4.9	4.2	4.3	-0.1	-7.1
Spanked Child in Last Week***	43.8	51.8	-8.0**	-16.1	49.5	55.4	-5.9	-11.8	47.6	54.9	-7.3	-14.6
Sample Size												
Parent Interview	**381**	**352**	**733**		**417**	**391**	**808**		**294**	**278**	**572**	
Parent-Child Interactions	**324**	**302**	**626**		**366**	**321**	**687**		**251**	**232**	**483**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of parent-child interactions during semi-structured tasks conducted when children were approximately 24 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

TABLE D.8N *(continued)*

[a]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant. A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based services, and/or participated in Early Head Start parent-child group activities.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8O

IMPACTS ON PARENTING KNOWLEDGE AT AGE 2, BY PATTERN OF IMPLEMENTATION

	Early Implementers					Later Implementers					Incomplete Implementers			
Outcome	Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]		Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]		Program Group	Control Group[a]	Impact Estimate Per Participant[b]	Effect Size[c]
Knowledge of Child Development														
Knowledge of Infant Development Inventory (KIDI)	3.5	3.4	0.0	6.6		3.3	3.2	0.1***	20.2		3.4	3.4	0.0	8.5
Discipline Strategies														
Percentage of Parents Who Suggested Responses to Hypothetical Conflicts with Child:														
Prevent or Distract***[d]	74.8	63.5	11.3***	24.2		73.9	69.5	4.4	9.4		69.2	68.5	0.7	1.4
Remove Child or Object***	84.8	85.4	-0.7	-1.7		81.4	84.6	-3.2	-8.3		73.9	74.5	-0.7	-1.7
Talk and Explain***	41.4	30.4	10.9***	23.4		39.7	32.4	7.4*	15.7		31.6	28.2	3.4	7.3
Threaten or Command***	31.3	38.6	-7.3*	-15.5		38.2	38.7	-0.5	-1.1		25.8	23.3	2.5	5.3
Shout***	5.6	3.9	1.7	7.8		4.7	5.2	-0.5	-2.2		6.7	6.7	0.1	0.1
Physical Punishment***	15.9	23.6	-7.7**	-16.7		32.9	35.5	-2.6	-5.7		33.1	33.7	-0.5	-1.2
Percentage of Parents Suggesting Only Mild Responses to the Hypothetical Conflicts***	49.6	40.7	8.9**	18.2		37.1	35.0	2.1	4.3		42.4	39.9	2.5	5.1
Index of Discipline Severity	2.3	2.6	-0.3**	-17.6		2.9	3.0	-0.1	-4.9		2.8	2.8	-0.1	3.8
Safety Practices														
Has Syrup of Ipecac at Home***	41.1	38.1	3.1	6.7		15.2	17.6	-2.5	-5.4		33.9	35.3	-1.4	-3.1
Has Poison Control Number***	47.7	43.9	3.9	8.0		24.5	23.4	1.1	2.3		43.0	39.5	3.5	7.3
Has Gates or Doors in Front of Stairs***	77.8	77.0	0.9	2.2		83.9	87.4	-3.4	-8.8		73.9	77.8	-3.9	-10.0
Uses Guards or Gates for Windows***	64.0	67.4	-3.4	-7.0		76.5	73.6	2.9	6.1		44.9	53.9	-9.0*	-18.7
Covers Electric Outlets***	62.0	60.3	1.7	3.5		57.3	57.0	0.3	0.7		62.5	62.5	0.0	0.0
Home has Working Smoke Alarm***	87.8	84.2	3.6	9.9		84.4	82.0	2.4	6.6		89.5	89.6	-0.1	-0.3
Uses a Car Seat***	82.7	82.7	0.1	0.1		83.8	83.0	0.7	1.9		74.7	79.7	-5.0	-13.2
Observed Child Play Area is Safe***	67.0	63.7	3.2	7.0		64.0	66.4	-2.3	-5.0		77.7	76.4	1.2	2.6
Sample Size	**381**	**352**	**733**			**417**	**391**	**808**			**294**	**278**	**572**	

SOURCE: Parent interviews conducted when children were approximately 24 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant. A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based services, and/or participated in Early Head Start parent-child group activities.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

TABLE D.8O *(continued)*

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE D.8P

IMPACTS ON PARENT HEALTH AND FAMILY FUNCTIONING AT AGE 2, BY PATTERN OF IMPLEMENTATION

	Early Implementers					Late Implementers					Incomplete Implementers			
Outcome	Program Group Participants[a]	Control Group[b]	Impact Estimate Per Participant[c]	Effect Size[d]		Program Group Participants[a]	Control Group[b]	Impact Estimate Per Participant[c]	Effect Size[d]		Program Group Participnts[a]	Control Group[b]	Impact Estimate Per Participant[c]	Effect Size[d]
Parent's Physical Health														
Overall Health Status	3.5	3.4	0.1	9.8		3.4	3.4	0.1	5.5		3.5	3.6	-0.1	-7.4
Parent's Mental Health														
Parenting Stress Index: Parental Distress	24.2	25.7	-1.5**	-15.4		25.7	27.4	-1.7**	-17.4		24.5	25.1	-0.6	-5.9
Parenting Stress Index: Parent-Child Dysfunctional Interaction	16.9	17.1	-0.2	-3.1		17.7	18.1	-0.4	-6.3		16.0	17.1	-1.1**	-17.4
Composite International Diagnostic Interview (CIDI) Short Screening Scales: Major Depression (lower bound)	12.2	16.9	-4.7*	-15.6		13.2	9.8	3.4	11.4		10.3	10.8	-0.5	-1.7
Family Functioning														
FES Family Conflict	1.7	1.7	-0.1	-12.8		1.7	1.8	0.0	-4.6		1.6	1.7	-0.1	-16.0
Sample Size	**381**	**352**	**733**			**417**	**391**	**808**			**294**	**278**	**572**	

SOURCE: Parent interviews, child assessments, and videotaped interactions conducted when children were approximately 24 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities.

[b]The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant. A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based services, and/or participated in Early Head Start parent-child group activities.

[c]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[d]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[e]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

D.9 ANALYSES OF PARENTING OUTCOMES AT 24 MONTHS AS MEDIATORS OF CHILD OUTCOMES AT 36 MONTHS

Early Head Start programs seek to influence children's well-being by providing center-based and/or home-based child development services directly to children and by providing services to support and inform parents. Programs thus intervene to enhance children's development both through direct services to the child and indirectly, through changes in parenting practices and behavior. Therefore, we would expect that changes in parenting behavior brought about by Early Head Start would, in concert with direct services from the program, help influence children's outcomes in the future.

We conducted analyses to explore the relationships between Early Head Start impacts on parenting outcomes at 24 months and program impacts on children a year later. In this appendix, we describe the models and summarize the results.

A. MODELS OF PARENTING INFLUENCES ON CHILD OUTCOMES

At 36 months, Early Head Start had favorable impacts on children's cognitive and language development and on some aspects of social-emotional behavior. In particular, 3-year-old children enrolled in Early Head Start had higher Bayley MDI scores, higher PPVT-III scores, higher levels of engagement with the parent and sustained attention with objects during semistructured play; and lower levels of negativity toward the parent during semistructured play and lower levels of aggressive behavior.

Theories of child development suggest that these favorable outcomes for children may be partly attributable to the program's impacts on parents at an early point. For example, previous research has shown that children's language development is related to the amount and variety of language they are exposed to by caregivers, so we would expect that earlier impacts on support for the cognitive, language, and literacy environment of the home and regular reading to the

child could contribute to children's language gains later on. Similarly, previous research indicates that children's aggressive behavior is related to experiences of punitive parenting practices, so we would expect that the program's success at reducing the incidence of physical punishment at 24 months could contribute to reductions in aggressive behavior later on.

At 24 months, Early Head Start had favorable impacts on several important aspects of parenting, including emotionally supportive parenting, support for language and cognitive development, parenting knowledge, insensitivity, and punitive behavior. To explore whether the pattern of Early Head Start program impacts on children at 36 months is consistent with developmental theory and program theories of change that suggest a relationship between earlier impacts on parenting behavior and future impacts on children, we conducted analyses of the association between impacts on child outcomes at 36 months and impacts on related parenting behavior at 24 months. In choosing parenting mediators for each child outcome, we have tried to identify one parenting mediator to represent a distinct aspect of parenting behavior such as emotionally supportive parenting, rather than using several variables from a single domain that may provide overlapping information.

For child cognitive and language impacts, we estimated their association with parenting practices that theory suggests would promote cognitive and language development. Thus, we included in these models supportiveness during semistructured play at 24 months, which is based on observations of parent-child play and indicates the extent to which parents responded to the child's cues, showed sensitivity and positive regard for the child, and attempted to extend the play by providing language stimulation and learning opportunities. We included the support for cognitive, language, and literacy environment subscale of the HOME at 24 months because it measures materials in the child's environment and parenting behavior with the child that provide cognitive and language stimulation (for example, the availability of a variety of toys to simulate

development and frequent reading to the child). We also included whether the parent reads to the child every day at 24 months. The three variables give us an observer's rating of the parent's responsiveness and cognitive stimulation of the child, a measure of the stimulating materials in the child's environment, and a measure of the parent's reading within the structure of the day.

For positive aspects of children's social-emotional behavior during semistructured play, we estimated their association with parenting practices that theory suggests would strengthen the child's engagement of the parent and curiosity and attentiveness to a task (sustained attention). Thus, the model for engagement of parent includes variables measuring warm and supportive behavior, cognitive stimulation, and insensitivity, which together are expected to influence the child's positive relationship with the parent. We included warm sensitivity during parent-child semistructured play at 24 months, or the extent to which the parent responded to the child's cues and showed sensitivity and positive regard for the child.[14] It also includes the emotional responsivity subscale of the HOME at 24 months, which measures the parent's responsiveness to the child based on observations by the home interviewer. We included the support for cognitive, language, and literacy environment subscale of the HOME at 24 months because it measures parent activities to stimulate learning in part through play and reading, which are expected to strengthen the parent-child relationship. We included detachment during semistructured play at 24 months, or the extent to which the parent is inattentive to the child, inconsistently attentive, or

[14]Warm sensitivity is a composite of two out of three variables that comprised the measure of Supportiveness. Warm sensitivity includes Positive Regard and Sensitivity, but omits Cognitive Stimulation; all three of the variables are averaged to create the Supportiveness measure.

interacts with the child in an indifferent manner, because detached parenting may dampen the child's interest in trying to engage the parent in play.

The model for children's sustained attention toward objects includes a similar set of parenting variables, but with somewhat more emphasis on cognitive stimulation along with emotional support. Thus, in addition to the HOME support for cognitive, language, and literacy environment subscale at 24 months, we also include supportiveness during semistructured play at 24 months. We include knowledge of infant development because parents who are more knowledgeable are expected to provide the emotional support and cognitive stimulation that can enhance the child's curiosity and attention to a task. We include parental distress because parents who are distressed in their parenting role may be less able to provide the emotional support and cognitive stimulation needed to enhance children's attention to play tasks.

For negative aspects of children's social-emotional development, we included emotionally supportive parenting behavior, punitive behavior, parental distress, and insensitivity (for child negativity) and structuring the day (for aggressive behavior). For negativity toward the parent in play, we included warm sensitivity during semistructured play at 24 months, or the parent's responsiveness and warmth toward the child during semistructured play, because we expect children to show less negativity toward a parent who is more warm and sensitive during play. We included physical punishment in the past week at 24 months because we expect use of physical punishment to increase child negativity toward the parent. We included parental distress because stress and depression in the parenting role is likely to be detrimental to the parent-child relationship and thus increase child negativity toward the parent. We included intrusiveness during semistructured play at 24 months, or the extent to which the parent controlled the pace and direction of play, grabbed toys from the child, or did not take turns or

consider the child's perspective in play. Such parenting behavior could provoke child negativity toward the parent.

Our model for child aggressive behavior includes warm sensitivity, physical punishment in the past week, and parental distress, all measured when the child was 24 months old, because lower levels of emotional support, and higher levels of punitiveness or stress and depression in the parenting role are expected to increase the child's level of aggressive behavior. In addition, we included whether the child had a regular bedtime at 24 months because parents who keep the child on a bedtime schedule may help ensure that the child feels rested and secure, which may tend to reduce aggressive behavior.

B. APPROACH TO ESTIMATION

The approach to the mediated analysis can be thought of as having three stages. In the first stage, the child outcome at 36 months is regressed on the 24-month parenting mediators and other explanatory variables that were not changed by the program, such as the parent's age, ethnicity, and other characteristics at enrollment (moderators). In the second stage, the regression coefficient on each mediator is multiplied by the Early Head Start impact on that mediator. These products are what we would expect the program impacts on the child outcome to be on the basis of the estimated relationship between the parenting mediators and the child outcome (in other words, what the program impact on the child is expected to be if all of the program's influence came through the earlier impacts on parenting). We label these products the "implied" impacts. Finally, the *implied* impacts are compared to the *actual* impact on the child outcome. These results indicate the extent to which impacts on the child outcome variable can be partitioned into impacts attributable to each parenting mediator.

Formally, we conducted the mediated analysis by first estimating the following regression model:

$$(1)\quad y = \alpha_0 + \alpha_1 T + \sum_i M_i \gamma_i + X\beta + \varepsilon,$$

where y is a child outcome at 36 months, T is an indicator variable equal to 1 for program group members, M_i is a mediating parenting variable at 24 months, X are explanatory variables (moderators), ε is a mean zero disturbance term, and the other Greek letters are parameters to be estimated. The estimated parameters from this model were then used to partition the *impact* on y (denoted by I_y) as follows:

$$(2)\quad I_y = \hat{\alpha}_1 + \sum_i I_{M_i} \hat{\gamma}_i,$$

where I_{Mi} is the impact on the mediator.

In this formulation, the parameter, γ_i, represents the marginal effect of a particular mediator on the outcome measure, holding constant the effects of the other mediators and moderators. For example, it represents the change in the longer-term outcome measure if the value of the mediator were increased by one unit, all else equal. Thus, the impact of Early Head Start on the longer-term outcome in equation (1) can be decomposed into two parts: one due to the mediators (the "implied" impacts) and the second due to residual factors (represented by the parameter α_1). Our analysis focuses on the part due to the mediators and the extent to which these implied impacts account for the impact on the longer-term outcome.

While the mediated analyses allow us to estimate relationships among variables that developmental theory predicts are related, these models are not structural models, and therefore

cannot measure causal relations between parent and child measures. Structural analyses of parent behavior and child development are very difficult to conduct because of the complex relationships among various measures of the parent's mental health and parenting behavior and simultaneity problems that lead to bias in the estimated relationships between parent and child outcomes. Therefore, the goal of these analyses is more modest than establishing a measured causal link between parenting impacts and child impacts. Instead, the goal is best viewed as establishing whether there are associations between the parenting and child impacts that are consistent with theories of change. We cannot measure the individual parameters reliably, but the patterns of association are likely to indicate that causal relations exists. In particular, these analyses are designed to provide some plausible support for or raise questions about programs' theories of change that suggest programs have an impact on children through earlier impacts on parenting behavior.

C. RESULTS OF THE MEDIATED ANALYSES FOR THE FULL SAMPLE

Table D.9A presents the results of estimating the models of children's cognitive and language development. The first column lists the 24-month parent variables entered into the model as mediators of the 36-month child impact listed in the column heading. The second column shows the estimated relationships between each of the parenting outcomes in the model and the child cognitive outcome; and the third column indicates whether this association is significantly different from zero. For the fourth column, we use the estimated relationships

TABLE D.9A

ESTIMATED MEDIATING EFFECTS OF 24-MONTH PARENTING IMPACTS ON EARLY HEAD START PROGRAM IMPACTS ON ASPECTS OF CHILDREN'S COGNITIVE AND LANGUAGE DEVELOPMENT AT 3 YEARS OF AGE

24-Month Mediator	Estimated Effect of Parenting Outcomes on Bayley MDI	Significance Level	Percentage of Impact on Bayley MDI Associated with Mediator
Supportiveness: Semistructured Play	2.32	***	9.8
HOME Support of Cognitive, Language, and Literacy Environment	1.23	***	14.0
Read Daily	1.16	*	3.2
Total			**27.1**

24-Month Mediator	Estimated Effect of Parenting Outcomes on PPVT-III	Significance Level	Percentage of Impact on PPVT-III Associated with Mediator
Supportiveness: Semistructured Play	2.37	***	6.9
HOME Support of Cognitive, Language, and Literacy Environment	1.45	***	11.4
Read Daily	1.46	n.s.	2.8
Total			**21.1**

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

between the parenting outcomes and child outcomes and the impacts on parenting and child outcomes to compute the percentage of the impact on the child outcome that is associated with the impact on the parenting outcome.

These analyses indicate that children's scores on the Bayley MDI at 36 months are related to higher levels of parent supportiveness in semistructured play, greater support for cognitive and language development, and daily reading at 24 months. In total, the estimates suggest support for the idea that some of the Early Head Start impact on children's cognitive development could have occurred because of the program's impacts on parents' sensitivity and cognitive stimulation in interactions with the child, and their support in the home for the child's cognitive and language development. Estimates also suggest a positive relationship between 36-month PPVT III scores and parent supportiveness in play and support for cognitive and language development, but not daily reading. In total, these estimates suggest that part of the Early Head Start impact on children's receptive language ability at 3 years of age could have emerged because of earlier impacts on the parent's sensitivity, cognitive stimulation, and support for the child's language development across a range of parenting situations (during play, through regular daily reading, and during everyday interactions in the home).

Table D.9B displays the results of estimating the models of parenting behavior and positive aspects of children's social-emotional behavior at 36 months. The estimates indicate that children's engagement of the parent during semistructured play is positively related to the parent's warm sensitivity during observed semistructured play a year earlier; parent's emotional responsivity observed a year earlier; and the level of language and cognitive stimulation available in the home environment a year earlier. The relationship between child engagement

TABLE D.9B

ESTIMATED MEDIATING EFFECTS OF 24-MONTH PARENTING IMPACTS ON EARLY HEAD START IMPACTS ON POSITIVE ASPECTS OF CHILDREN'S SOCIAL-EMOTIONAL DEVELOPMENT AT 3 YEARS OF AGE

24-Month Mediator	Estimated Effect of Parenting Outcomes on Engagement	Significance Level	Percentage of Impact on Engagement Associated with Mediator
Warm Sensitivity: Semistructured Play	0.21	***	8.9
HOME Emotional Responsivity	0.05	***	3.7
HOME Support of Cognitive, Language, and Literacy Environment	0.05	***	6.1
Detachment: Semistructured Play	-0.01	n.s	0.5
Total			**19.3**

24-Month Mediator	Estimated Effect of Parenting Outcomes on Sustained Attention	Significance Level	Percentage of Impact on Sustained Attention Associated with Mediator
Supportiveness: Semistructured Play	0.15	***	8.5
HOME Support of Cognitive, Language, and Literacy Environment	0.04	**	5.9
Knowledge of Infant Development	0.16	**	6.1
PSI: Parental Distress	-0.006	**	4.5
Total			**25.0**

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

and parent detachment during play a year earlier was not significantly different from zero. In total, the estimates suggest that Early Head Start positive impacts on the child's engagement of the parent in semistructured play at 36 months are consistent with earlier positive program impacts on the parent's sensitivity during play, responsiveness to the child, and cognitive stimulation and support for language development in the home.

The results of estimating the model of child sustained attention to objects during semistructured play at 36 months indicate that the child's attention and focus on play is positively related to parent's sensitivity and cognitive stimulation during semistructured play a year earlier; support for cognitive development and language stimulation in the home environment in the previous year; and the parent's knowledge of child development measured at 24 months. Sustained attention toward objects during play at 36 months is negatively related to parental distress measured in the previous year. In total, the estimates suggest that part of the positive impact on children's sustained attention to objects during semistructured play at 36 months could have come about because of earlier favorable program impacts on parent supportiveness in semistructured play; cognitive stimulation and language support in the home environment, and knowledge of child development; and through reductions in parental distress.

Table D.9C shows the results of estimating the models of parenting behavior and negative aspects of children's social-emotional behavior at 36 months. The estimates indicate that children's negativity toward the parent in semistructured play at 36 months is inversely related to parents' warm sensitivity during semistructured play observed in the previous year; and positively related to levels of parental distress and intrusive behavior during semistructured play measured in the previous year. The relationship between child negativity at 36 months and the parent's use of physical punishment a year earlier is not significantly different from zero. In total, the estimates suggest that part of the reduction in levels of child negativity toward the

TABLE D.9C

ESTIMATED MEDIATING EFFECTS OF 24-MONTH PARENTING IMPACTS ON EARLY HEAD START IMPACTS ON NEGATIVE ASPECTS OF CHILDREN'S SOCIAL-EMOTIONAL DEVELOPMENT AT 3 YEARS OF AGE

24-Month Mediator	Estimated Effect of Parenting Outcomes on Child Negativity	Significance Level	Percentage of Impact on Negativity Associated with Mediator
Warm Sensitivity	-0.05	***	6.0
Physical Punishment Last Week	0.02	n.s.	1.7
PSI: Parental Distress	0.004	**	7.0
Intrusiveness: Semistructured Play	0.06	***	3.6
Total			**18.2**

24-Month Mediator	Estimated Effect of Parenting Outcomes on Aggressive Behavior	Significance Level	Percentage of Impact on Aggressive Behavior Associated with Mediator
Warm Sensitivity: Semistructured Play	-0.46	***	7.5
Physical Punishment Last Week	1.52	***	17.3
PSI: Parental Distress	0.19	***	44.6
Regular Bedtime	-0.32	n.s.	2.7
Total			**72.0**

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

parent during semistructured play that came about through Early Head Start participation might be associated with Early Head Start-induced increases in parent warmth and sensitivity during play and reductions in parental distress and intrusiveness during play measured one year earlier.

The estimates of the model of children's aggression at 3 years of age and parenting behavior in the previous year indicate that children's aggression is inversely related to the parent's warm sensitivity during semistructured play and positively related to the use of physical punishment and levels of parental distress measured in the previous year. The relationship between aggression and the parent's setting a regular bedtime for the child is not significantly different from zero. In total, the estimates indicate that part of the Early Head Start impact reducing levels of aggression in 3-year-old children is partly attributable to the program's positive impact on parents' warm sensitivity toward the child during play and to the program's impact reducing the incidence of physical punishment in the previous year. The relationship between children's aggressive behavior and earlier levels of parental distress appears fairly large, but the relationship may be overstated because of measurement error. Part of the correlation may occur because distressed parents may view their children's behavior more negatively than an outside observer would.

To check the robustness of these findings, we also substituted an alternative measure of parent reading: reading at bedtime. The alternative variable, reading at bedtime, indicates that the parent followed a bedtime routine most days in the past week and volunteered that it included reading. We found that the proportion of the impact on the Bayley MDI and PPVT-III at 36 months that is associated with bedtime reading is very similar to the proportion associated with daily reading, and the overall proportion of the impact associated with all of the parenting mediators in each of the models changes by only about 3 percentage points.

In summary, the estimates of models relating children's behavior at 36 months to parenting behavior measured a year earlier in the full sample suggest some support for the theory that part of the Early Head Start program impact on children could have come about because of earlier favorable changes in parenting behavior. The estimates of the relationships between parenting behavior and children's outcomes and the Early Head Start program impacts on these outcomes are consistent with the theory, although the models we have estimated are not structural and therefore cannot establish a causal link between the parenting impacts and impacts on children.

D. MODELS BY PROGRAM APPROACH

Early Head Start programs that chose different approaches to service delivery typically also had different theories of change regarding how the program would intervene in children's lives. Center-based programs, which offered center-based child development services as well as parent education, expected changes to occur mainly through the direct services, with only a small impact of the program coming through changes in parenting. Home-based programs focused child development services directly on the child and on the parent, because these programs expected the parent to enhance the effects of the program on the child. Mixed programs, which blended center-based and home-based services in different patterns, would likely fall in the middle in terms of the expected program effects on the child that would be mediated by the parent.

To explore whether the impacts we have found for parenting measures at 24 months and child outcome measures at 36 months are consistent with the program-specific theories of change, we estimated mediated models by program approach that were similar to those estimated for the full sample. When a particular child outcome was not very different for program and control groups within a program type, we did not run a model predicting parenting effects on that impact. Although parenting variables likely do affect the child outcome in that case, it did not

make sense to estimate the model because Early Head Start had no impact on that outcome. We also did not estimate a model if the impacts on parenting outcomes were not very different from zero at 24 months, because once again, while parenting behavior likely has an influence on particular child outcomes, parenting could not have been an important mediator if the program impacts on parenting were very small or zero. In some cases, when a particular parenting outcome was not changed by Early Head Start at 24 months, we substituted a similar parenting outcome from the same domain for which the program did have an impact so that we could estimate whether there was a relationship between parenting impacts and later child impacts. These substitutions were possible because parenting variables were selected for the main model so that a single variable represented a domain of parenting, and often, alternative variables measuring similar aspects of parenting were available.

Table D.9D presents the results of estimating models of the 36-month child outcomes by program approach. For center-based programs, we estimated models of cognitive and language development and aggressive behavior. Models of the other three social-emotional outcomes could not be estimated because, within the center-based group, Early Head Start had no impact on nearly all key parenting mediators that might predict these outcomes. In each model that we did estimate for families in center-based programs, one or two of the parenting mediators was not changed by Early Head Start at 24 months, so the models did not include all of the variables used for the full sample. The results of the estimation suggest that parenting behavior at 24 months is related to the later child outcomes in the expected directions, but the implied pathway for program impacts through parenting behavior to children in the later period appears to be fairly small, in part because few of the parenting influences were affected by the program in the earlier period.

TABLE D.9D

ESTIMATED EFFECTS OF PARENTING IMPACTS ON CHILDREN'S DEVELOPMENT AT THREE YEARS

Parenting Mediators	Center-Based Programs		Mixed-Approach Programs		Home-Based Programs	
	Estimated Effect of Parenting Variables on Child Outcome	Percentage of Child Impact Associated with Mediator	Estimated Effect of Parenting Variables on Child Outcome	Percentage of Child Impact Associated with Mediator	Estimated Effect of Parenting Variables on Child Outcome	Percentage of Child Impact Associated with Mediator
Bayley MDI						
Supportiveness: Semistructured Play	n.a.	n.a.	2.24***	-149.3	1.92***	5.0
HOME Support of Cognitive, Language, and Literacy Environment	n.a.	n.a.	1.04**	-114.0	1.41***	16.0
Parent-Child Play	1.85*	2.9	n.a.	n.a.	n.a.	n.a.
Read Daily	0.14	0.3	1.75	-65.3	1.31	1.7
Percentage of Child Outcome Attributed to Parenting	--	*3.2*	--	*-328.6*	--	*22.6*
PPVT Score						
Supportiveness: Semistructured Play	n.a.	n.a.	3.00***	13.6	0.79	2.7
HOME Support of Cognitive, Language, and Literacy Environment	n.a.	n.a.	1.16*	8.4	1.30**	19.2
Parent-Child Play	1.31	-2.0	n.a.	n.a.	n.a.	n.a.
Read Daily	5.86***	14.5	0.01	0.0	0.55	0.9
Percentage of Child Outcome Attributed to Parenting	--	*12.5*	--	*22.0*	--	*22.8*
Sustained Attention with Objects: Semistructured Play	Not Estimated					
Supportiveness: Semistructured Play			0.09*	7.3	0.12***	5.3
HOME Support of Cognitive, Language, and Literacy Environment			0.03	4.4	0.04	6.9

Table D.9D (*Continued*)

Parenting Mediators	Center-Based Programs		Mixed-Approach Programs		Home-Based Programs	
	Estimated Effect of Parenting Variables on Child Outcome	Percentage of Child Impact Associated with Mediator	Estimated Effect of Parenting Variables on Child Outcome	Percentage of Child Impact Associated with Mediator	Estimated Effect of Parenting Variables on Child Outcome	Percentage of Child Impact Associated with Mediator
Knowledge of Infant Development Inventory			0.19	4.9	0.28***	15.1
PSI: Parental Distress			-0.01	5.8	-0.00	1.9
Percentage of Child Outcome Attributed to Parenting			--	*22.4*	--	*29.3*
Engagement of Parent: Semistructured Play	Not Estimated					
Warm Sensitivity: Semistructured Play			0.18***	15.2	0.22***	4.7
HOME Emotional Responsivity			-0.003	-0.3	0.11***	6.8
HOME Support of Cognitive, Language, and Literacy Environment			0.06*	9.0	0.05*	5.0
Parent-Child Play			n.a.	n.a.	n.a.	n.a.
Detachment: Semistructured Play			-0.14**	11.4	n.a.	n.a.
Percentage of Child Outcome Attributed to Parenting			--	*35.3*	--	*16.5*
Negativity toward Parent: Semistructured Play	Not Estimated				Not Estimated	
Warm Sensitivity: Semistructured Play			-0.01	0.8		
Physical Punishment in Past Week			-0.03	-2.4		
PSI: Parental Distress			0.01	6.8		
Intrusiveness: Semistructured Play			0.07**	4.9		
Percentage of Child Outcome Attributed to Parenting			--	*10.1*		
Aggressive Behavior						
Warm Sensitivity: Semistructured Play	n.a.	n.a.	-0.54*	12.1	-0.33	33.6

Table D.9D (*Continued*)

Parenting Mediators	Center-Based Programs		Mixed-Approach Programs		Home-Based Programs	
	Estimated Effect of Parenting Variables on Child Outcome	Percentage of Child Impact Associated with Mediator	Estimated Effect of Parenting Variables on Child Outcome	Percentage of Child Impact Associated with Mediator	Estimated Effect of Parenting Variables on Child Outcome	Percentage of Child Impact Associated with Mediator
	2.13***	10.2	1.34**	17.6	1.44***	81.2
PSI: Parental Distress	n.a.	n.a.	0.14***	35.9	0.20***	393.7
Regular Bedtime	-1.45**	7.5	0.14	-0.5	-0.30	20.7
Percentage of Child Outcome Attributed to Parenting	--	*17.8*	--	*65.1*	--	*529.2*

SOURCE: Parent interviews, child assessments, and assessments of parent-child interactions when children were approximately 24 and 36 months old.

For home-based programs, we estimated all of the models except for negativity toward the parent during semistructured play at three years. At 24 months, Early Head Start had a favorable impact on nearly all of the aspects of parenting used in these models, so only one variable was omitted from one model (engagement of parent). The estimated relationships between parenting behavior variables at 24 months and children's outcomes at 36 months were consistently in the expected directions. Overall, the estimates suggest that part of the Early Head Start impact on the cognitive, language, and socio-emotional development of children in home-based programs could have emerged because of earlier impacts on related parenting behavior.

The model for aggressive behavior among children in home-based programs has the striking result that more than 500 percent of children's aggressive behavior at 36 months is potentially associated with the earlier changes in parenting. Most of the association between parenting and children's aggression stems from a large estimated relationship between parenting behavior at 24 months and children's aggressive behavior at 36 months, which again could be partly attributable to measurement error leading to some degree of spurious correlation between these two measures.

For mixed-approach programs, we estimated all of the models, and since Early Head Start influenced all key parenting outcomes at 24 months, none had to be omitted from any model. For the most part, the estimated relationships between parenting behavior at 24 months and child outcomes a year later are usually in the expected directions. Supportiveness, cognitive stimulation, and language support are all positively related to cognitive and language development and positive aspects of social-emotional development and inversely related to negative aspects of social-emotional development. Intrusiveness, detachment, and parental distress are all inversely related to positive aspects of social-emotional development and positively related to negative aspects of social-emotional development. Within the mixed-

program group, there are a few exceptions to these rules, but in these cases the estimates are usually small (not different from zero) and the percentage of the child impact associated with the parenting mediator is small. Overall, the estimates are consistent with the theory that, for families in mixed-approach programs, part of the Early Head Start impact on children's outcomes may be mediated by earlier impacts on parenting behavior.

In the model relating the Bayley MDI scores to parenting behavior a year earlier for families in mixed-approach programs, the estimated relationships appear to be particularly strong, which makes the proportion of the Bayley MDI impact that is associated with earlier parenting impacts unreasonably high. Unfortunately, such a result is possible with the two-stage estimation procedure, which cannot force the results to fall between 0 and 100 percent. Instead, the procedure takes the estimated association between the parenting outcomes and child outcomes and checks the consistency of the earlier parenting impacts and that association with the ultimate child impacts a year later. An unreasonable result such as this can suggest either that the theory of which parenting behaviors affect the child outcome is incorrect, or (more likely) that this model is incorrect because it does not correctly capture all of the structural relationships among parenting behavior, genetics, other home influences, and children's outcomes.

Nevertheless, while the specific parameter estimates from the models are likely to be biased, the overall pattern of association between parenting impacts at 24 months and children's impacts at 36 months can provide an indication of whether the impacts are consistent with the programs' theory of change. Estimates for mixed and home-based programs do lend some support to Early Head Start program theories of change that suggest a role for parenting as a mediator of program impacts on children. For center-based programs, parenting appears not to have had much of a role in mediating program impacts on children, in large part because few impacts on parenting were found at the 24-month assessment.

APPENDIX E

SUPPLEMENTAL TABLES BY CHAPTER

CONTENTS

This Appendix presents tables that contain additional data cited in Chapters II through VII. The table numbers indicate which chapter they relate to, for example, tables for chapter IV are numbered E.IV.1, E.IV.2, and so forth. They are presented in the order in which they are referred to in the text of the main report.

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APPENDIX E.II.A

RANDOM ASSIGNMENT AND RELATED ISSUES IN THE EARLY HEAD START EVALUATION: COMMONLY ASKED QUESTIONS AND ANSWERS

Mathematics Policy Research, Inc.

February 21,1997

Since the beginning of random assignment and program enrollment in June 1996, Mathematica has responded to numerous questions. fu some instances, we and ACYF have clarified procedures, modified approaches, and developed new policies. This document brings together the most important questions that EHS programs and local research teams have been asking. This document includes some questions from a previous Q&A document about random assignment and several new questions that have come up in the past several months. We begin with a review of the key steps in random assignment. The Q&As are grouped under random assignment, maintaining the research sample, and completing the HSFIS application and enrollment forms. If you have any questions about these procedures or how to handle specific situations, contact Diane Paulsell at MPR at (609) 275-2297 (e-mail: dpaulsell@mathematicampr.com).

A. OVERVIEW OF RANDOM ASSIGNMENT PROCEDURES

All programs should be submitting families for random assignment according to the following procedures:

1. Determine each family's eligibility for Early Head Start (EHS), and for those who are eligible, complete the full HSFIS application and enrollment forms.

2. Within one month of application, transmit the following information to Mathematica Policy Research, Inc. (MPR) and to the local research partner:

   - A fax cover sheet listing the names of applicants, verification of three aspects of their eligibility for the research sample, and the subgroup to which they belong (if random assignment subgroups have been identified for the program)
   - Pages 1-4 of the HSFIS form for each applicant listed on the fax cover sheet
   - A copy of the signature page of the consent form for each applicant listed on the fax cover sheet; this information should be sent to Rosiland Page (phone: 609-897-7413; fax: 609-936-1462; e-mail: rpage@mathematica-mpr.com).

3. Receive lists of families selected for the program and for the comparison group from MPR (usually within 48 hours). (At the request of the Denver program, we send that site only the list of program families.)

4. Notify families selected for *the* program group, enroll them in the program, and begin providing services as soon as possible. (The local research partner will notify families assigned to the comparison group.)

5. Send full copies of the HSFIS application and enrollment forms for each applicant submitted for random assignment to NPR within two weeks. MPR will do the data entry until the automated HSFIS is ready for use.

6. Local research staff should periodically fax a listing to MPR that documents when each comparison group family was notified of its status.

B. RANDOM ASSIGNMENT

1. Which families are eligible to participate in the research?

To participate in the research, all families must meet the general EHS eligibility criteria established by ACYF and the more specific criteria established by individual EHS programs. In addition, all families who meet these criteria must also meet the following conditions:

- The family must include a child who is 12 months old or younger on the date of application or a pregnant woman. In addition, this child must have been born or have an expected due date that falls between September 1, 1995 and June 30, 1997.
- The family must not have participated in the Comprehensive Child Development Program (CCDP) for 3 months or more during the previous 5 years.
- The family must not have participated in Head Start, Early Head Start, a Parent Child Center (PCC), or another similar program for 3 months or more during the previous 12 months.
- The family must be enrolled (submitted for random assignment) no later than June 30, 1998.

2. Must programs submit all eligible families for random assignment?

Yes. Programs should not enroll any families who meet the eligibility criteria outlined above outside of the random assignment process unless an exemption has been granted by ACYF. Non-research program slots should only be used for the following types of families:

- Families who are eligible for EHS but do not meet the research eligibility requirements because their child is more than 12 months old; their child's birthrate falls outside of the eligibility window; or they previously participated in CCDP, Head Start, Early Head Start, PCC, or another similar program
- Families assigned to the program group who will not participate in the research because they are part of a multiple family household as described in question 7 below
- Families who are granted an exemption from random assignment by ACYF

3. On what grounds will ACYF grant an exemption from random assignment?

ACYF will grant an exemption from random assignment only in cases of extreme need. For example, ACYF may grant an exemption if program enrollment is necessary to protect a child from physical harm.

4. What steps should a program follow to request an exemption?

The program director must request an exemption *before* submitting the family for random assignment. An exemption cannot be requested after random assignment because a family was assigned to the comparison group. To request an exemption, the program director must first make a request to her or his local research team. The local research team will review the request, discuss it with the program, and, if appropriate, forward it to ACYF. The final decision about whether to grant an exemption from random assignment will be made by ACYF. Contact Helen Raikes (202-205-2247) to request an exemption.

5. What should a program do if it cannot obtain informed parental consent for minors to participate in the EHS Evaluation?

For minors to participate in the evaluation, it is very important to obtain informed parental consent. However, we understand that in certain cases it may be nearly impossible for a program to obtain such consent for a minor (for example, if the minor is living in a separate household, is estranged from parents, or is emancipated). Regardless, we request that programs make every effort to obtain the parent's or a guardian's consent in all cases, even if such consent is not required for the minor to receive services. But, if it is impossible or prohibitively expensive for a program to obtain such consent, we will randomize the minor without consent if the program takes the following steps:

- Write a memo to MPR that clearly and succinctly explains (1) the local program requirements for serving a minor without parental consent, and (2) the state guidelines for providing other types of public services to minors without consent (for example, the general guidelines that AFDC or WIC use to provide assistance to minors.) An *example* of such an explanation is as follows:

  In this state, minors can receive public services as independent cases and without parent or guardian consent if they are living apart from their parent or guardian; consequently, the local EHS program can also provide services to the individual without parent or guardian consent. In addition, circumstances are such that we cannot reasonably be expected to obtain parent or guardian consent in this and other such cases. Therefore, we ask that Mathematica randomize this minor for the EHS Evaluation without such consent.

- Reference this memo on the consent form for all such cases where parent or guardian consent cannot be obtained.

- In the case of legally emancipated minors, provide documentation of emancipation if at all possible. Documentation, if it exists, will likely vary by state. If it is not possible to obtain such documentation, the above memo should be referenced.

- In the case of a minor who is married, the husband should not sign the consent form and is not considered a legal guardian. A minor who is legally married is recognized as having achieved the age of majority for any legal purpose and is responsible for her own acts. Therefore, a mother who is younger than 18 and married should sign the consent form herself.

6. How will MPR randomly assign families in multiple family households?

We want to avoid situations in which a program family and a comparison group family live together because it may be difficult to prevent the comparison group family from receiving services (comparison family members may be present during home visits, for example). Therefore, when two or more families-related or not-are living together in the same home, they will be considered a multiple family household and if they both (all) apply to the EHS program, they will be treated as *one family* for purposes of random assignment. In other words, they will be assigned to the same group, and both will be considered program group families, or both will be considered comparison group families. If both families are selected for the program group, the EHS program may decide whether to serve both families or not. However, only one family will participate in the national evaluation assessment activities, and only that family will count toward the 75 program families required for the research sample. Similarly, if the two (or more) families are assigned to the comparison group, MPR will select just one of them to participate in the evaluation assessments.

7. What is the program's role in handling multiple family households (MFHs)?

Whenever possible, programs should notify MPR about a family's status as an MFH *prior to* random assignment. We will not re-assign families after random assignment, as this will diminish the validity of random assignment and will negatively affect the- evaluation. Program staff should take the steps listed below when submitting families from MFHs for random assignment:

- *If MFH families apply to EHS at the same time:* The program should verify that the families are part of an MFH and indicate this on each family's HSFIS application. Program staff should clearly indicate on the top of the HSFIS form and on the cover page of their submission to Mathematica that the families are part of an MFH. This can be done by writing "MFH" in the upper right hand comer of the first page of the HSFIS application form and by writing "MFH" next to each family's information on the submission cover page. If the families are assigned to the program group, MPR will randomly select one family to participate in the research assessments. The program should then serve this family; it has the option to decide whether and to what extent it will serve the other family(ies).

- *If an EHS applicant is living in the same household with a family already enrolled in the program group and the program wants to serve this family*: The program should verify that the applicant family lives with the programs group family and clearly indicate both on top of the HSFIS form and on the cover page of their submission that the family lives with a program group family. This can be done by writing 1V4FH-P in the upper right hand comer of the first page of the HSFIS application form and by writing NIFH-P next to the applicant's information on the submission cover page. The program-should also attach a copy of the first page of the program family's HSFIS application so that MPR can match the new applicant to the program family. The program may decide whether or not to serve this new family.

  However, the family will not become part of the research sample, will not count toward the 75 program families required for the research sample, and will not participate in the research assessments.

- *If an EHS applicant is living in the same household with a comparison group family*: Because programs are not providing services to comparison group families, we recognize that these cases may be more difficult for programs to identify. However, when programs are able to identify such cases, the applicants will not be eligible to receive program services and will not become part of the research sample. Therefore, programs should not recruit families who are living in the same households with a comparison-group family.

8. How does MPR handle the random assignment of twin children?

The family unit, not the child, is randomly assigned to either the program group or the comparison group. If the family is assigned to the program group, both twins may be served by the EHS program, but only one twin will be assessed for research purposes. NIPR will select the evaluation focus child at random. If one twin has a disability, that will have no bearing on the selection of the focus child-it will still be random.

9. How can programs ensure that they meet the 10 percent guideline for enrolling children with disabilities?

At least 10 percent of the children enrolled in Head Start must be children with disabilities. Early Head Start programs who are beginning enrollment and who are enrolling pregnant women should work with project officers to ensure that they follow a recruitment strategy likely to result in an enrollment in which at least 10 per cent of the children have disabilities, or in which risk factors for disabilities are present, as relevant within seven states for which specified categories of risk constitute eligibility. All programs will need to demonstrate that they have an intensive recruitment effort for children with identified disabilities and that they are working with appropriate agencies (such as United Cerebral Palsy, Association for Retarded Persons, and neonatal intensive care units) to recruit children with disabilities.

10. Should families whose incomes exceed the Head Start income eligibility requirement be submitted as a subgroup?

We will not form subgroups for families who are over income. Since no more than 10 percent of the EHS program enrollment can be families who are over the income eligibility requirement, we recommend recruiting less than 10 percent to prevent having more of these families selected into the program group than the comparison group.

C. MAINTAINING THE RESEARCH SAMPLE

1. After programs have filled all of their slots, it is likely that a few families will leave the program. If a family leaves the program, what procedures should be followed to fill the vacancy?

Programs should submit applicants for random assignment whenever a vacancy occurs, until the maximum research sample size has been reached. Applicants (whether newly recruited or from a waiting list) should be sent to 1VIPR only when the program has an opening. For every one opening, the program can send from one to "a few" applicants for random assignment (except for the Utah program, which must send an even number of applicants). Since we conduct random assignment one case at a time (except in Utah, where we use a batch process), if the first family is assigned to the program group, then this family can be enrolled in the program and the rest can be returned to the waiting list. If, however, the first family is assigned to the comparison group, then we will randomly assign the remaining families, one by one, until a family is assigned to the program group and the vacancy if filled.

2. What happens if a family drops out of the program or moves out of the service area after being randomly assigned to the program but before the program begins delivering services?

These families will be treated the same as families who drop out of the program at any other time. They will still be included in the program group of the research sample. The data collectors will make every reasonable effort to follow families who drop out at any time in the process and, whenever possible, conduct assessments on the same schedule as planned for other families in the research sample. In its analyses, MPR will adjust for the extent to which the families receive services, but it is very important that programs make every effort to retain, to the extent possible, all families who are selected for the EHS program group. ***It is very important to be sure that the family being recruited understands and is truly interested in receiving program services and participating in the research before completing the application/enrollment forms that are submitted to MPR.***

3. What happens if a comparison group family moves out of the service area?

If a comparison family moves away from the EHS service area, we do not consider it to have dropped out of the research sample. Wherever comparison group families live, they will receive whatever services are normally available in the community without EHS, and therefore

constitute a legitimate comparison. The national evaluation will make reasonable attempts to follow such families and to conduct the interviews and assessments. MPR will work with the local researchers to determine whether it is feasible to continue following such families and what costs are reasonable to incur for this purpose.

4. What happens if a family says it no longer wishes to participate in the research?

All families participating in the EHS national evaluation may refuse to participate in the research at any time. However, once a family goes through random assignment, it will not be dropped from the research sample, and NPR, through the local researchers, will continue to invite these families to participate in future rounds of interviews and assessments. As with all contacts with families, MPR's approach to communicating with families who have refused to participate will ensure that they are contacted in a respectful and sensitive manner.

When a program family refuses to participate in data collection activities, the local researcher will contact program personnel. Working together, the research and program staff will decide on the appropriate approach to take with the family, taking into account the family's current circumstances and needs. They should remind the family of its commitment to participate in both the program and the research. They should also be aware that the family's circumstances may change, and the family may decide to participate in the program and research at a future date. If the researcher finds that the family still refuses at the time of the next round of data collection, the researcher should again notify the program so that the program can counsel the family about its options. If, after considering various alternatives the family still refuses to participate in the research, the program should disenroll the family. The research team will continue to attempt to contact the family at the time of future data collections to obtain minimal data for the purpose of understanding why refusals occur.

5. What should a program do if it discovers that a family is ineligible for EHS after that family has been randomly assigned?

The program should write a memo to MPR documenting the specifics of the case and requesting directions for how to proceed. If the family was assigned to the program group, the program should explain the error to the family and explain that it cannot continue to receive services. If the family was assigned to the comparison group, the local researcher should inform the family that it will no longer be part of the research. It is very important that programs check eligibility carefully before submitting families for random assignment so that the number of such cases is kept to a minimum.

6. Will families in which the focus child dies or is miscarried continue participating in the research?

No. MPR will not continue collecting data from families after the focus child has died or is miscarried. While we feel that some valuable information about service use could be collected from these families, we have decided that problems with continuing data collection outweigh the advantages. It is up to the program to decide whether it will continue providing services to these

families. In addition, NPR will not change the focus child after he or she has been selected, even if the focus child dies and another sibling is eligible to participate in the research.

7. What happens if the focus child's primary caregiver changes?

Because the focus of our research is the child, when the focus child becomes the responsibility of a new primary caregiver, MPR will follow the child. For example, a child may begin living with a different parent or a grandmother midway through the evaluation. It is up to the program to decide how it wishes to handle service delivery to the child's new primary caregiver.

Cases of adoption constitute an exception to this rule. If the focus child is adopted by another family, we may not be able to follow the child, because the birth mother may not know the identity of the adoptive parents and adoption agencies may not provide this information. Therefore, MPR will stop collecting data from families in which the focus child is adopted by another family.

8. Can program group families who move to the service area of another EHS research site enroll in EHS in their new location?

Yes. If a program group family moves to the service area of another research site, the family can enroll in the new program without going through random assignment a second time. However, it is up to the new program to determine whether it will enroll the family. Because each local program has tailored its eligibility criteria to its local area and program design, the family may not be eligible for the new program. Also, the new program may already have a waiting list for families who want to enroll in EHS.

9. Can comparison group families receive services that are similar to EHS services?

Comparison group families are permitted to apply for any services available in their communities, except those services restricted to EHS program participants. At one site, several comparison group families have enrolled in a local CCDP program. At another site, a comparison group family enrolled in Child Development Associate (CDA) training provided by the EHS program to community members who are interested in becoming child care providers. MPR believes these situations provide a valid counterfactual, because they represent the types of services available to non-EHS families in local communities.

10. What happens if comparison group families receive program services?

Programs should make every effort to avoid providing services to comparison group families. If you discover that services have mistakenly been provided to a comparison group family, please document the type and extent of services received and notify NPR as soon as possible. For national evaluation purposes, comparison group families who receive program services will still be counted as comparison group members when the data are analyzed. We

need the documentation so we can understand how these families differ from comparison members who are not receiving services.

D. THE HEAD START FAMILY INFORMATION SYSTEM (HSFIS)

1. Who can programs call about questions relating to the HSFIS?

Questions about the HSFIS should be directed to Lihong Ma at NEE (301-738-1122). A back-up is Bill Wilson (202-205-8913). Ellen Kisker at NPR (609-275-2379) can also field questions, particularly pertaining to the application and enrollment forms.

2. Do the complete HSFIS application and enrollment forms have to be completed before random assignment?

Yes. However, only the first 4 pages need to be sent to MPR at that time. The rest of the HSFIS pages can be sent later.

3. Which version of the HSFIS forms should programs use?

Program should use the new version of the HSFIS application and enrollment forms that were provided to programs at the December 1996 Infant/Toddler Institute. However, programs should continue using the first 4 pages of the July version (the Preface), even though these pages were not included with the most resent version. These are the four pages that programs fax to MPR when submitting names for random assignment.

4. If the applicant is a pregnant woman, do programs have to fill out the HSFIS information on the program child after the child is born and then send that to MPR?

Yes. ACYF has specified the need for this information. Programs must send HSFIS application and enrollment information on program children to MPR after the child is born. At some point in the future it may be possible for MPR to obtain this information in an automated fashion from the HSFIS contractor. However, until we notify programs otherwise, programs should provide us with the hard copy HSFIS forms. Programs are not required to collect this information for babies born to comparison group families. This information will be collected by local research teams as described under question 5.

5. What is the program's role in collecting HSFIS data on the child of a comparison group family?

The program is responsible for completing the HSFIS application and enrollment forms for all applicants at intake, including those who get assigned to the comparison group. However, some women enroll in EHS during pregnancy, before the birth of the focus child. The program is not responsible for collecting HSFIS application and enrollment data for children born after

enrollment who are assigned to the comparison group. In addition, the program is not responsible for collecting HSFIS service module data for comparison group families.

6. What is the local research team's role in collecting HSFIS data on babies born to comparison group families after enrollment?

Local research teams will be responsible for collecting HSFIS application and enrollment data on babies born to comparison group mothers enrolled during pregnancy. MPR is developing a form for data collectors to use at the time of the 12-month Parent Services Follow Up Interview (PSI). Some questions from the HSFIS will be omitted because the information will be obtained during other interviews with the parent. Although we do not think that the subcontract budget implications of adding this form will be significant, we will monitor the actual costs for completing the PSI and make adjustments as necessary.

7. Does the "Project Head Start Consents, Authorizations, and Releases Form" need to be completed and medical records information obtained (to complete the HSFIS forms) and sent to MPR before random assignment?

It would be ideal to have the forms and information at the point of random assignment, but it is not imperative. We understand that obtaining medical releases and records information takes time and we do not wish to hold up the random assignment process because of it. Programs should send the Head Start release forms and completed HSFIS question based on the medical records to MPR a soon as possible after they are completed.

APPENDIX E.II.B

TABLE E.IIB

EXPLANATORY VARIABLES FOR REGRESSIONS

Variable	Percent of Families	Number of Sites in Which the Variable Varies
Family and Parent Characteristics		
Age of Mother		
Younger than 20[a]	39	17
20 to 25	33	17
25 or older	28	16
Race and Ethnicity		
White non-Hispanic[a]	37	17
Black non-Hispanic	35	16
Hispanic	24	17
Other (Asian or Pacific Islander, American Indian, Eskimo, Aleut)	5	16
English Language Ability		
Primary language is English[a]	79	16
Primary language is not English but the applicant speaks English well	10	16
Primary language is not English and the applicant does not speak English well	11	12
Highest Grade Completed		
Less than 9[a]	11	17
9 to 11	37	17
12 or earned a GED certificate	28	17
More than 12	24	17
Primary Occupation		
Employed[a]	23	17
In school or a training program	22	17
Unemployed	28	17
Out of the Labor Force	27	17
Living Arrangements		
Living with a partner[a]	25	17
Living with other adults	39	17

TABLE E.IIB *(continued)*

Variable	Percent of Families	Number of Sites in Which the Variable Varies
Living with no other adults	36	17
Number of Children in the Household		
Ages 0 to 5	0.5[c]	17
Ages 6 to 17	0.5[c]	17
Household Income as a Percent of the Poverty Level (Percent)		
Less than 33[a]	25	17
33 to 67	25	17
67 to 99	21	17
100 or more	11	17
Missing	18	17
Welfare Receipt		
AFDC/TANF	34	17
Food Stamps	48	17
WIC	87	17
SSI	7	17
Inadequate Resources		
Food	5	17
Housing	12	17
Money	20	17
Medical care	14	17
Transportation	21	17
Number of Moves in the Past Year	0.9[c]	17
Random Assignment Date		
Before 10/96[a]	36	15
10/96 to 6/97	31	16
After 6/97	33	16
Child Characteristics		
Age of Focus Child (Months)		
Unborn	25	17
Less than 3[a]	21	17
3 to 6	22	17
6 or more	32	17

TABLE E.IIB *(continued)*

Variable	Percent of Families	Number of Sites in Which the Variable Varies
Birthweight Less than 2,500 Grams[b]	7	17
Born More Than 3 Weeks Early[b]	10	17
Male	51	17
Received an Evaluation Because of Concerns About the Child's Overall Health and Development or Because of Suspected Developmental Delay[b]	5	17
Risk Categories		
Has established risks[b]	8	17
Has biological or medical risks[b]	12	17
Has environmental risks[b]	24	17
Previously Enrolled in Head Start or Another Childhood Development Program[b]	13	17
Missing Section on Child Characteristics[b]	8	17

SOURCE: HSFIS application and enrollment forms.

NOTE: In addition to the variables shown above, we included a control variable for child age (in months) for child outcomes that were not age-adjusted.

[a]This indicator variable was omitted from the explanatory variables in the regression models.

[b]These variables pertain to families with focus children who were born at the time of program application. The variables were set to zero for families with unborn focus children (because an indicator variable for these families was included in the regression models), but the figures in the second and third columns of this table pertain only to those with born children.

[c]Figures for these continuous variables are variable means.

APPENDIX E.IV

TABLE E.IV.1
FAMILY CHARACTERISTICS, BY SITE

Subgroup	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Average Across Sites
Race/Ethnicity																		
White non-Hispanic	27	79	4	19	77	21	75	82	1	60	12	17	27	3	4	20	92	36
Black non-Hispanic	72	1	93	5	15	58	17	4	46	23	87	40	34	9	0	78	3	34
Hispanic	1	13	3	66	5	20	3	7	40	4	1	40	31	85	92	1	3	24
Other	1	6	1	9	3	1	5	8	12	13	0	4	9	3	3	1	2	5
Primary Language																		
English	97	97	97	63	94	85	94	88	60	92	99	71	64	24	19	98	97	79
Other	3	3	3	37	6	15	6	12	40	8	1	29	36	76	81	2	3	21
Age of Child at Enrollment																		
Unborn	33	26	32	38	15	36	33	20	7	66	30	14	7	16	18	13	12	24
0-4 months	35	34	35	36	36	30	41	23	40	31	40	8	45	44	42	42	45	36
5-12 months	33	40	33	26	49	34	26	57	52	3	30	78	48	40	40	46	42	40
Child's Birth Order																		
Firstborn	43	68	100	73	45	57	61	56	89	61	84	59	45	44	53	77	53	63
Later-Born	57	32	0	27	55	43	39	44	11	39	16	41	55	56	47	23	47	37
Mother's Age When Child Was Born																		
Under 20	30	34	68	36	33	45	37	30	60	36	89	36	22	16	36	37	24	39
20 or older	70	66	32	64	67	55	63	70	40	64	11	64	78	84	64	63	76	61
Child's Gender																		
Female	55	52	44	54	47	50	47	49	45	51	52	54	42	51	44	44	49	49
Male	45	48	56	46	53	50	53	51	55	49	48	46	58	49	56	56	51	51
Family Was Receiving AFDC/TANF Cash Assistance																		
Yes	69	8	53	25	12	51	50	35	32	55	41	31	13	29	31	29	36	35
No	31	92	47	75	86	49	50	65	68	45	59	69	87	71	69	71	64	65
																		0
Primary Occupation																		
Employed	14	23	22	21	43	15	25	29	10	17	8	35	30	17	23	43	24	23
In school or training	19	20	40	17	15	27	11	19	48	14	67	31	6	5	10	19	8	22
Other	67	57	39	61	42	57	64	52	42	69	25	34	64	79	66	38	68	54
Highest Grade Completed																		
Less than 12th grade	34	35	52	49	29	57	45	33	70	42	79	45	32	66	86	38	28	48
12th grade or GED	42	30	29	22	40	25	35	34	10	33	14	24	37	14	9	40	43	28
More than 12th grade	24	35	19	29	31	19	21	33	19	25	7	31	32	20	5	22	29	24
Living Arrangements																		
With spouse	10	62	3	23	34	14	15	34	11	21	5	13	53	39	41	17	30	25
With other adults	39	29	16	62	26	46	46	22	52	43	84	57	22	26	31	40	32	40
Alone	51	9	81	14	40	39	39	44	37	36	12	30	24	36	27	44	37	35
																		0
Number of Maternal Risk Factors																		
0-1	8	41	7	18	30	8	12	23	10	15	2	18	44	18	8	22	23	18
2-3	56	48	47	56	58	56	55	62	55	55	50	62	48	64	57	52	58	55
4-5	35	11	46	26	12	36	33	14	35	31	48	20	9	18	34	26	20	27

Source: Head Start Family Information System application and enrollment forms.

Note: Sites are presented in random order.

TABLE E.IV.2
CHARACTERISTICS OF FAMILIES IN KEY PROGRAM SUBGROUPS
(Percents)

Subgroup	Average Across Sites	1997 Program Approach			Overall Implementation			Implementation of All Services		State Requires Parents of Infants to Work	
		Center	Home-based	Mixed	Early	Later	Other	Strong Full	Not Strong or Not Full	Yes	No
Race/Ethnicity											
White nonhispanic	36	29	39	39	58	22	28	64	29	53	25
Black nonhispanic	34	45	28	35	23	33	50	21	39	23	43
Hispanic	24	22	29	21	14	41	16	11	27	19	28
Other	5	5	4	6	5	4	6	3	5	5	5
Primary Language											
English	79	81	74	83	89	66	81	90	75	86	73
Other	21	19	26	17	11	34	19	10	25	14	27
Age of Child at Enrollment											
Unborn	24	12	25	32	28	25	20	24	26	23	26
0-4 months	36	32	36	38	31	41	36	35	35	31	39
5-12 months	40	56	38	31	41	35	45	41	39	46	36
Child's Birth Order											
Firstborn	63	68	61	62	57	65	67	57	64	63	63
Later-Born	37	33	39	38	43	35	33	43	36	37	37
Mother's Age When Child Was Born											
Under 20	39	42	36	42	35	42	42	35	40	35	43
20 or older	61	59	64	58	65	58	58	65	60	65	57
Child's Gender											
Female	49	48	49	50	51	49	47	50	49	50	48
Male	51	53	51	50	50	51	53	50	51	50	52
Family Was Receiving AFDC/TANF Cash Assistance											
Yes	35	26	39	37	32	34	40	26	38	27	41
No	65	74	61	63	68	66	60	74	62	73	59
Primary Occupation											
Employed	23	33	22	19	26	23	21	25	23	31	18
In school or training	22	28	18	23	19	22	26	19	23	19	24
Other	54	39	61	57	55	56	53	56	54	50	58
Highest Grade Completed											
Less than 12th grade	48	46	50	48	39	61	44	39	51	39	55
12th grade or GED	28	29	28	29	33	22	30	33	27	32	26
More than 12th grade	24	26	22	24	28	17	25	28	22	29	20
Living Arrangements											
With spouse	25	19	29	24	29	23	22	35	22	28	23
With other adults	40	44	30	48	39	48	30	34	40	40	39
Alone	35	38	41	27	32	29	47	31	38	31	38
Number of Maternal Risk Factors											
0-1	18	20	17	18	23	13	18	25	16	23	14
2-3	55	57	56	54	56	56	54	55	56	56	55
4-5	27	23	27	28	22	31	28	20	28	20	31

Source: Head Start Family Information System application and enrollment forms.

TABLE E.IV.3

IMPACTS ON SERVICE RECEIPT DURING THE FIRST 28 MONTHS, BY PROGRAM APPROACH IN 1997

	Center-Based Programs				Mixed-Approach Programs				Home-Based Programs		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Any Services											
Any Key Services***[a,b]	92.6	85.5	7.1**		97.3	80.7	16.6***		96.0	80.1	15.9***
Any Home Visits or Center-Based Child Care***	86.8	63.7	23.1***		94.8	62.0	32.8***		94.2	51.3	42.9***
More Than 1 Home Visit or 2 Weeks Center-Based Child Care***	84.3	56.5	27.7***		93.7	55.9	37.8***		93.6	46.3	47.3***
Home Visits or Center Care at Required Intensity in at Least 1 Followup***	59.7	27.0	32.7***		80.4	14.6	65.7***		76.8	5.0	71.8***
Home Visits or Center Care at Required Intensity in All 3 Followups***	28.1	10.1	18.0***		29.8	4.1	25.7***		30.4	0.1	30.3***
Home Visits											
Any Home Visits***	72.6	23.3	49.3***		89.7	41.5	48.2***		92.9	33.3	59.7***
Any Child Development Services During Home Visits***	70.4	20.8	49.5***		88.3	43.3	45.1***		87.3	41.8	45.5***
Weekly Home Visits, 1st Follow-Up Period***	4.6	3.5	1.1		53.9	3.0	50.9***		62.4	2.3	60.0***
Weekly Home Visits, 2nd Follow-Up Period***	2.1	1.9	0.1		37.0	2.6	34.3***		53.2	1.9	51.2***
Weekly Home Visits, 3rd Follow-Up Period***	3.0	2.6	0.4		28.1	2.8	25.3***		43.4	2.3	41.0***
Weekly Home Visits in At Least 1 Followup***	7.8	4.6	3.3		66.2	5.5	60.7***		76.8	5.0	71.8***
Weekly Home Visits in All 3 Followups***	0.4	1.6	-1.3		17.0	0.6	16.4***		30.4	0.1	30.3***
Child Care											
Any Child Care***	93.6	89.3	4.3		89.8	78.6	11.2***		78.7	76.3	2.4
Any Center-Based Child Care***	78.7	52.5	26.2***		52.2	34.5	17.7***		32.3	27.0	5.3*
Average Hours per Week of Center-Based Care***	13.5	6.8	6.7***		5.4	2.6	2.8***		2.6	1.6	1.0**
Concurrent Child Care Arrangements***	72.8	62.3	10.6**		52.1	39.0	13.1***		38.2	41.0	-2.8
Average Weekly Out-of-Pocket Cost of Care***	$3.70	$10.89	-$7.19***		$5.55	$8.34	-$2.79*		$4.08	$3.82	0.3
Received a Child Care Subsidy***	16.3	34.1	-17.8***		28.4	27.6	0.9		36.5	36.7	-0.2
Child was in Care at 12 Months of Age***	88.7	78.1	10.6**		63.8	44.9	18.9***		55.9	53.6	2.3
Child was in Care at 24 Months of Age***	81.2	75.3	6.0		66.3	48.6	17.7***		49.0	46.2	2.7
Case Management											
Any Case Management Meetings***	73.5	58.3	15.2***		91.5	55.0	36.4***		90.3	54.3	36.0***
Weekly Case Management, 1st Follow-Up Period***	16.7	9.7	7.0*		49.9	7.4	42.5***		59.2	10.6	48.6***
Weekly Case Management, 2nd Follow-Up Period***	10.7	5.0	5.7**		37.5	5.8	31.8***		45.5	4.0	41.5***
Weekly Case Management, 3rd Follow-Up Period***	6.1	2.5	3.7*		30.7	5.7	25.0***		39.9	4.9	35.0***

TABLE E.IV.3 (*continued*)

	Center-Based Programs				Mixed-Approach Programs				Home-Based Programs		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Group Activities											
Any Group Parenting Activities***	68.3	37.7	30.6***		70.3	38.5	31.8***		73.1	35.8	37.3***
Any Parent-Child Group Activities***	30.0	13.5	16.5***		45.3	17.4	27.9***		45.3	11.5	33.8***
Early Intervention Services											
Identification of Child's Disability***	8.4	4.9	3.5		6.4	6.4	-0.0		7.6	5.0	2.7*
Services for Child with Disability***	5.4	2.4	3.0		3.4	4.1	-0.7		5.3	3.7	1.5
Child Health Services											
Any Child Health Services***	100.0	100.0	0.0		100.0	99.6	0.5		100.0	99.8	0.2
Any Doctor Visits***	99.1	99.5	-0.5		98.9	97.0	1.9*		99.0	98.7	0.3
Any Emergency Room Visits***	56.0	56.3	-0.4		54.1	48.3	5.8		53.4	56.0	-2.6
Number of Emergency Room Visits for Injuries	0.2	0.3	-0.1		0.2	0.2	-0.0		0.3	0.3	-0.0
Any Dentist Visits***	38.4	32.8	5.6		23.2	19.3	3.9		27.1	28.1	-1.0
Any Screening Tests***	69.3	68.6	0.7		71.1	70.6	0.5		62.4	61.0	1.4
Any Immunizations***	97.8	97.4	0.4		98.7	97.6	1.1		99.1	98.5	0.7
Family Development Services											
Any Education-Related Services***	83.3	66.1	17.2***		91.8	61.4	30.3***		86.9	50.8	36.1***
Any Employment-Related Services***	68.0	43.5	24.5***		81.9	47.6	34.4***		77.3	47.1	30.2***
Any Family Health Services[c]	100.0	100.0	0.0		100.0	100.0	0.0		100.0	100.0	0.0
Any Family Mental Health Services***	19.8	14.7	5.1		23.7	25.9	-2.2		23.9	21.0	2.9
Transportation Assistance***	27.3	22.5	4.8		38.1	22.1	15.9***		32.0	23.9	8.1***
Housing Assistance***	56.1	44.7	11.4**		51.3	55.5	-4.3		65.7	64.1	1.6
Sample Size	**230**	**204**	**434**		**358**	**354**	**712**		**488**	**453**	**941**

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally.

[a] Home visits, case management, center-based child care, and/or group parenting activities.

[b] Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

[c] There is no variance across subgroups due to lack of variance in level of services.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.IV.4

IMPACTS ON SERVICE RECEIPT DURING THE FIRST 28 MONTHS, BY PATTERN OF IMPLEMENTATION

	Early Implementers				Later Implementers				Incomplete Implementers		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Any Services											
Any Key Services***[a,b]	99.4	70.6	25.8***		96.3	81.3	15.1***		90.5	78.1	12.5***
Any Home Visits or Center-Based Child Care***	97.7	59.8	37.9***		92.1	58.4	33.7***		87.8	55.0	32.9***
More Than 1 Home Visit or 2 Weeks Center-Based Child Care***	96.4	53.7	42.7***		91.2	51.4	39.8***		87.0	49.7	37.3***
Home Visits or Center Care at Required Intensity in at Least 1 Followup***	86.3	17.0	69.3***		69.2	13.0	56.2***		65.8	9.1	56.8***
Home Visits or Center Care at Required Intensity in All 3 Followups***	41.7	4.0	37.7***		26.3	3.8	22.5***		21.7	1.1	20.6***
Home Visits											
Any Home Visits***	91.9	35.1	56.8***		87.4	36.2	51.3***		80.0	30.4	49.6***
Any Child Development Services During Home Visits***	91.3	33.1	58.3***		85.6	35.0	50.6***		80.1	25.7	54.4***
Weekly Home Visits, 1st Follow-Up Period***	53.5	2.6	50.9***		38.1	4.1	34.0***		44.9	2.4	42.5***
Weekly Home Visits, 2nd Follow-Up Period***	40.4	2.8	37.6***		33.7	2.4	31.3***		30.9	1.7	29.2***
Weekly Home Visits, 3rd Follow-Up Period***	29.5	2.4	27.0***		32.6	1.8	30.8***		23.5	2.5	21.1***
Weekly Home Visits in at Least 1 Followup***	59.5	5.5	54.0***		55.5	6.0	49.5***		54.8	3.8	50.9***
Weekly Home Visits in All 3 Followups***	24.4	0.3	24.1***		16.6	0.6	16.0***		15.0	0.1	15.0***
Child Care											
Any Child Care***	87.6	80.7	6.9**		81.3	76.8	4.5		90.4	83.2	7.2**
Any Center-Based Child Care***	56.0	35.8	20.2***		49.2	34.4	14.8***		45.6	35.9	9.7**
Average Hours per Week of Center-Based Care*	7.9	3.6	4.2***		5.1	3.1	2.0***		5.4	2.6	2.9***
Concurrent Child Care Arrangements***	56.7	48.8	7.9*		48.1	39.9	8.2**		48.9	47.1	1.9
Average Weekly Out-of-Pocket Cost of Care	$4.09	$7.33	-$3.23**		$3.53	$6.10	-$2.57***		$6.06	$8.08	- $2.02
Received a Child Care Subsidy***	26.3	30.8	-4.5		27.2	30.9	-3.7		36.1	35.5	0.6
Child was in Care at 12 Months of Age***	68.4	53.0	15.4***		60.1	58.9	5.1		74.2	54.6	14.6***
Child was in Care at 24 Months of Age	64.2	58.2	6.0		56.5	44.5	12.1***		69.9	58.6	11.3**
Case Management											
Any Case Management Meetings***	91.4	67.0	24.4***		85.4	51.8	33.6***		82.2	46.9	35.2***
Weekly Case Management, 1st Follow-Up Period***	54.3	10.0	44.3***		35.8	9.4	26.3***		47.6	8.6	39.0***
Weekly Case Management, 2nd Follow-Up Period***	42.0	6.4	35.6***		27.8	4.6	23.3***		31.7	5.1	26.6***
Weekly Case Management, 3rd Follow-Up Period***	32.9	6.5	26.4***		29.9	3.3	26.6***		22.5	3.6	18.9***

TABLE E.IV.4 (*continued*)

	Early Implementers				Later Implementers				Incomplete Implementers		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Group Activities											
Any Group Parenting Activities***	76.9	44.0	32.9***		68.7	30.9	37.9***		65.9	37.6	28.3***
Any Parent-Child Group Activities***	43.8	19.8	24.0***		46.0	8.1	37.9***		33.1	15.7	17.3***
Early Intervention Services											
Identification of Child's Disability***	6.3	7.2	-0.9		6.5	4.3	2.2		9.3	5.2	4.1*
Services for Child with Disability***	4.2	4.3	-0.1		3.4	2.6	0.8		6.5	4.0	2.5
Child Health Services											
Any Child Health Services***	100.0	100.0	0.0		100.0	99.5	0.5		100.0	100.0	0.0
Any Doctor Visits***	99.7	99.6	0.1		98.0	96.7	1.4		98.9	99.2	-0.3
Any Emergency Room Visits***	60.3	54.6	5.6		46.4	49.3	-2.9		55.6	57.5	-1.9
Number of Emergency Room Visits for Injuries	0.3	0.3	-0.0		0.1	0.2	-0.1*		0.3	0.3	-0.1
Any Dentist Visits***	32.2	24.2	8.0**		27.9	24.7	3.3		24.9	29.4	-4.5
Any Screening Tests***	64.4	62.1	2.3		64.3	64.4	-0.1		74.1	72.8	1.3
Any Immunizations***	99.0	97.4	1.6		98.1	97.6	0.5		99.2	98.5	0.7
Family Development Services											
Any Education-Related Services***	87.6	61.9	25.8***		83.9	55.6	28.4***		90.4	59.0	31.5***
Any Employment-Related Services***	77.2	48.8	28.5***		74.5	41.6	33.0***		78.9	49.3	29.6***
Any Family Health Services[c]	100.0	100.0	0.0		100.0	100.0	0.0		100.0	100.0	0.0
Any Family Mental Health Services***	30.3	27.5	2.8		17.1	16.2	0.9		20.0	20.8	-0.8
Transportation Assistance***	34.3	22.0	12.3***		34.8	19.2	15.5***		30.6	27.2	3.3
Housing Assistance***	58.1	56.5	1.6		49.9	47.6	2.3		68.3	67.8	0.4
Sample Size	**366**	**367**	**733**		**410**	**374**	**784**		**300**	**270**	**570**

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally.

[a] Home visits, case management, center-based child care, and/or group parenting activities.

[b] Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

[c] There is no variance across subgroups due to lack of variance in level of services.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.IV.5

IMPACTS ON SERVICE RECEIPT DURING THE FIRST 28 MONTHS, BY IMPLEMENTATION STATUS OF MIXED APPROACH PROGRAMS

	Early Implementers				Late or Incomplete Implementers		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Any Services							
Any Key Services***[a,b]	98.6	79.1	19.6***		96.7	81.7	15.0***
Any Home Visits or Center-Based Child Care***	95.0	62.7	32.4***		93.3	62.8	30.5***
More Than 1 Home Visit or 2 Weeks Center-Based Child Care***	93.2	58.2	35.0***		93.1	54.9	38.2***
Home Visits or Center Care at Required Intensity in at Least 1 Followup***	85.9	11.2	74.7***		71.9	20.8	51.1***
Home Visits or Center Care at Required Intensity in All 3 Followups***	31.2	3.7	27.5***		26.6	6.6	20.0***
Home Visits							
Any Home Visits***	93.1	49.1	43.9***		85.1	35.1	50.0***
Any Child Development Services During Home Visits***	91.0	48.0	43.0***		86.2	34.2	52.0***
Weekly Home Visits, 1st Follow-Up Period***	72.0	2.6	69.5***		35.4	3.9	31.6***
Weekly Home Visits, 2nd Follow-Up Period***	51.6	3.8	47.8***		20.7	3.3	17.5***
Weekly Home Visits, 3rd Follow-Up Period***	31.8	3.8	27.9***		23.4	2.9	20.5***
Weekly Home Visits in at Least 1 Followup***	81.1	6.2	74.9***		50.0	5.9	44.1***
Weekly Home Visits in All 3 Followups***	25.0	0.7	24.3***		8.2	1.3	7.0***
Child Care							
Any Child Care***	85.9	73.1	12.8**		94.8	83.0	11.7***
Any Center-Based Child Care***	43.6	29.3	14.3**		60.1	40.4	19.7***
Average Hours per Week of Center-Based Care	3.1	1.7	1.4		7.5	3.6	3.9***
Concurrent Child Care Arrangements***	43.8	34.1	9.7		61.0	43.2	17.7***
Average Weekly Out-of-Pocket Cost of Care	$6.64	$5.84	$0.81		$4.21	$11.12	-$6.91***
Received a Child Care Subsidy***	31.0	29.7	1.3		26.9	24.5	2.4
Child was in Care at 12 Months of Age**	53.9	36.2	17.8**		74.6	52.8	21.9***
Child was in Care at 24 Months of Age**	59.3	42.9	16.4**		72.8	53.8	19.0***
Case Management							
Any Case Management Meetings***	93.3	64.5	28.9***		88.9	46.5	42.4***
Weekly Case Management, 1st Follow-Up Period***	62.5	10.0	52.5***		38.1	4.1	34.0***
Weekly Case Management, 2nd Follow-Up Period***	49.1	6.5	42.6***		23.7	7.5	16.2***
Weekly Case Management, 3rd Follow-Up Period***	34.5	9.0	25.5***		25.4	3.9	21.5***
Group Activities							
Any Group Parenting Activities***	65.3	41.6	23.7***		74.5	36.5	37.9***
Any Parent-Child Group Activities**	38.9	23.4	15.6***		49.8	13.4	36.3***

TABLE E.IV.5 (*continued*)

	Early Implementers				Late or Incomplete Implementers		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Early Intervention Services							
Identification of Child's Disability***	3.1	6.3	-3.2		9.8	6.4	3.4
Services for Child with Disability***	1.6	3.6	-2.0		5.4	4.5	0.9
Child Health Services							
Any Child Health Services***	100.0	100.0	0.0		99.9	99.5	0.4
Any Doctor Visits***	100.0	99.0	1.1		97.9	94.8	3.2
Any Emergency Room Visits***	61.3	46.0	15.4**		48.3	49.4	-1.1
Number of Emergency Room Visits for Injuries	0.3	0.2	0.0		0.1	0.2	-0.1
Any Dentist Visits***	20.6	17.6	3.1		25.8	20.9	5.0
Any Screening Tests***	76.9	76.9	0.0		65.0	64.6	0.4
Any Immunizations***	99.5	97.4	2.1		97.4	98.3	-1.0
Family Development Services							
Any Education-Related Services***	88.8	56.7	32.1***		94.3	66.6	27.7***
Any Employment-Related Services***	81.9	58.7	23.2***		83.1	35.2	47.9***
Any Family Health Services[c]	100.0	100.0	0.0		100.0	100.0	0.0
Any Family Mental Health Services***	32.0	34.2	-2.2		14.0	19.2	-5.2
Transportation Assistance***	43.9	23.9	19.9***		32.3	20.3	12.1**
Housing Assistance***	59.4	62.1	-2.7		42.8	49.2	-6.4
Sample Size	**180**	**195**	**375**		**178**	**159**	**367**

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroups are included in the estimates for each subgroup.

[a]Home visits, case management, center-based child care, and/or group parenting activities.

[b]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups in the first two columns.

[c]There is no variance across subgroups due to lack of variance in level of services.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.IV.6

IMPACTS ON SERVICE RECEIPT DURING THE FIRST 28 MONTHS, BY IMPLEMENTATION STATUS OF HOME-BASED PROGRAMS

	Early or Late Implementers				Incomplete Implementers		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Any Services							
Any Key Services***[a,b]	96.7	81.4	15.2***		94.6	78.7	15.9***
Any Home Visits or Center-Based Child Care***	95.7	73.3	22.4***		94.6	72.4	22.2***
More Than 1 Home Visit or 2 Weeks Center-Based Child Care***	94.2	50.6	43.7***		94.5	51.9	42.6***
Home Visits or Center Care at Required Intensity in at Least 1 Followup***	80.4	5.9	74.5***		73.5	2.2	71.3***
Home Visits or Center Care at Required Intensity in All 3 Followups***	36.9	-0.2	37.1***		23.2	-1.1	24.3***
Home Visits							
Any Home Visits***	93.4	33.8	59.6***		92.6	32.5	60.1***
Any Child Development Services During Home Visits***	92.2	30.6	61.6***		92.7	28.9	63.8***
Weekly Home Visits, 1st Follow-Up Period***	63.9	3.2	60.8***		61.8	-0.5	62.2***
Weekly Home Visits, 2nd Follow-Up Period***	60.7	2.3	58.5***		43.1	1.5	41.6***
Weekly Home Visits, 3rd Follow-Up Period***	51.9	1.7	50.2***		33.7	1.3	32.5***
Weekly Home Visits in at Least 1 Followup***	80.4	5.9	74.5***		73.5	2.2	71.3***
Weekly Home Visits in All 3 Followups***	36.9	-0.2	37.1***		23.2	-1.1	24.3***
Child Care							
Any Child Care***	71.0	71.0	0.0		90.3	81.9	8.3**
Any Center-Based Child Care***	27.2	25.6	1.6		40.4	27.6	12.7**
Average Hours per Week of Center-Based Care	2.0	1.8	0.6		3.7	1.5	2.2***
Concurrent Child Care Arrangements***	32.3	35.5	-3.2		46.6	47.8	-1.3
Average Weekly Out-of-Pocket Cost of Care	$2.77	$2.59	$0.19		$5.71	$5.61	$0.10
Received a Child Care Subsidy***	22.0	28.8	-6.7		56.1	46.9	9.2
Child was in Care at 12 Months of Age***	43.4	45.7	-2.2		73.3	63.5	9.8*
Child was in Care at 24 Months of Age***	32.9	36.3	-3.4		69.4	60.7	8.7
Case Management							
Any Case Management Meetings***	88.1	55.3	32.8***		93.4	52.7	40.7***
Weekly Case Management, 1st Follow-Up Period***	57.7	12.5	45.3***		61.4	7.9	53.6***
Weekly Case Management, 2nd Follow-Up Period***	48.8	4.8	44.0***		41.4	2.6	38.8***
Weekly Case Management, 3rd Follow-Up Period***	47.9	5.2	42.7***		29.8	3.7	26.1***
Group Activities							
Any Group Parenting Activities***	75.6	37.1	38.6***		70.6	33.1	37.5***
Any Parent-Child Group Activities**	58.2	9.7	48.5***		29.1	13.1	16.0***

TABLE E.IV.6 (*continued*)

	Early or Late Implementers				Incomplete Implementers		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Early Intervention Services							
Identification of Child's Disability***	8.7	5.2	3.5*		6.5	4.3	2.2
Services for Child with Disability***	5.9	4.1	1.8		4.8	2.9	1.9
Child Health Services							
Any Child Health Services***	99.9	99.8	0.2		100.0	100.0	0.0
Any Doctor Visits***	98.3	98.0	0.3		99.9	99.6	0.3
Any Emergency Room Visits***	45.0	51.3	-6.2		64.3	62.6	1.7
Number of Emergency Room Visits for Injuries	0.2	0.3	-0.1***		0.4	0.3	0.1
Any Dentist Visits***	28.6	29.5	-0.9		23.9	27.4	-3.5
Any Screening Tests***	57.8	54.9	3.0		67.7	69.9	-2.3
Any Immunizations***	99.3	98.7	0.6		99.0	98.1	0.9
Family Development Services							
Any Education-Related Services***	83.6	49.7	33.9***		92.3	50.8	41.6***
Any Employment-Related Services***	70.3	38.1	32.2***		86.2	59.5	26.7***
Any Family Health Services[c]	100.0	100.0	0.0		100.0	100.0	0.0
Any Family Mental Health Services***	24.4	20.2	4.2		22.5	22.7	-0.2
Transportation Assistance***	31.6	14.7	16.9***		33.8	34.9	-1.0
Housing Assistance***	54.6	50.7	3.9		81.6	80.8	0.8
Sample Size	**287**	**276**	**563**		**201**	**177**	**378**

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroups are included in the estimates for each subgroup.

[a]Home visits, case management, center-based child care, and/or group parenting activities.

[b]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups in the first two columns.

[c]There is no variance across subgroups due to lack of variance in level of services.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.IV.7

IMPACTS ON SERVICE RECEIPT DURING THE FIRST 28 MONTHS, BY IMPLEMENTATION STATUS OF ALL SERVICES

	Strong Full Implementation				Not Strong or Not Full Implementation		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Any Services							
Any Key Services***[a,b]	99.3	82.4	16.8***		94.7	81.2	13.5***
Any Home Visits or Center-Based Child Care***	99.2	80.4	18.8***		93.2	75.0	18.2***
More Than 1 Home Visit or 2 Weeks Center-Based Child Care***	96.6	56.5	40.0***		91.6	58.4	33.3***
Home Visits or Center Care at Required Intensity in at Least 1 Followup***	87.9	12.8	75.0***		69.8	13.7	56.1***
Home Visits or Center Care at Required Intensity in All 3 Followups***	45.7	2.7	42.9***		25.7	3.1	22.7***
Home Visits							
Any Home Visits***	94.0	34.5	59.4***		85.0	33.5	51.4***
Any Child Development Services During Home Visits***	92.6	32.0	60.6***		84.1	31.3	52.8***
Weekly Home Visits, 1st Follow-Up Period***	62.0	2.0	60.0***		40.3	3.6	36.8***
Weekly Home Visits, 2nd Follow-Up Period***	50.5	3.1	47.5***		30.8	1.9	29.0***
Weekly Home Visits, 3rd Follow-Up Period***	38.3	1.5	36.9***		26.1	2.3	23.8***
Weekly Home Visits in at Least 1 Followup***	69.1	4.4	64.8***		53.0	5.3	47.6***
Weekly Home Visits in All 3 Followups***	32.7	-0.4	33.1***		14.7	0.5	14.2***
Child Care							
Any Child Care***	83.6	78.2	5.4		86.6	81.0	5.7***
Any Center-Based Child Care***	47.1	29.6	17.5***		51.3	37.5	13.8***
Average Hours per Week of Center-Based Care	5.1	2.9	2.3***		6.4	3.3	3.1***
Concurrent Child Care Arrangements***	52.6	42.3	10.3**		51.6	45.4	6.2**
Average Weekly Out-of-Pocket Cost of Care	$4.54	$5.52	-$0.99		$4.39	$7.66	-$3.28***
Received a Child Care Subsidy***	21.2	22.4	-1.2		32.0	35.3	-1.3
Child was in Care at 12 Months of Age***	62.7	49.8	12.9*		68.2	56.9	11.3***
Child was in Care at 24 Months of Age***	55.2	49.1	6.1		64.6	54.3	10.3***
Case Management							
Any Case Management Meetings***	96.1	67.1	29.1***		84.3	51.6	32.7***
Weekly Case Management, 1st Follow-Up Period***	68.4	8.8	59.7***		39.5	8.9	30.6***
Weekly Case Management, 2nd Follow-Up Period***	53.6	5.6	48.0***		28.4	4.8	23.6***
Weekly Case Management, 3rd Follow-Up Period***	43.8	5.4	38.4***		24.5	3.9	20.6***
Group Activities							
Any Group Parenting Activities***	71.6	40.5	31.1***		70.5	36.5	34.0***
Any Parent-Child Group Activities**	47.2	22.0	25.1***		39.3	12.5	26.8***

TABLE E.IV.7 (*continued*)

	Strong Full Implementation				Not Strong or Not Full Implementation		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Early Intervention Services							
Identification of Child's Disability***	7.4	8.0	-0.6		7.2	4.9	2.3**
Services for Child with Disability***	4.4	5.7	-1.3		4.5	3.1	1.5
Child Health Services							
Any Child Health Services***	100.0	100.0	0.0		100.0	99.8	0.2
Any Doctor Visits***	99.4	99.5	-0.1		98.7	98.1	0.6
Any Emergency Room Visits***	61.0	53.8	7.2		51.9	53.5	-1.6
Number of Emergency Room Visits for Injuries	0.3	0.3	-0.0		0.2	0.3	-0.1
Any Dentist Visits***	29.8	22.3	7.5*		27.9	27.3	0.5
Any Screening Tests***	73.5	68.1	5.4		64.9	65.8	-0.9
Any Immunizations***	99.2	96.9	2.3*		98.7	98.1	0.6
Family Development Services							
Any Education-Related Services***	88.3	56.3	32.0***		87.3	59.0	28.3***
Any Employment-Related Services***	79.0	48.7	30.4***		76.2	45.6	30.5***
Any Family Health Services[c]	100.0	100.0	0.0		100.0	100.0	0.0
Any Family Mental Health Services***	25.2	21.3	3.9		19.4	20.3	-0.9
Transportation Assistance***	28.3	13.4	14.9***		34.7	25.6	9.1***
Housing Assistance***	57.1	58.7	-1.5		58.2	56.5	1.7
Sample Size	**255**	**254**	**509**		**821**	**757**	**1,578**

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroups are included in the estimates for each subgroup.

[a]Home visits, case management, center-based child care, and/or group parenting activities.

[b]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups in the first two columns.

[c]There is no variance across subgroups due to lack of variance in level of services.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.IV.8

IMPACTS ON SERVICE RECEIPT DURING THE FIRST 28 MONTHS, BY WORK REQUIREMENTS FOR MOTHERS RECEIVING AFDC/TANF

	Mothers of Children Under 1 Required to Work				Mothers of Children Under 1 Not Required to Work		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Any Services							
Any Key Services***[a,b]	97.5	88.2	9.3***		94.5	77.0	17.5***
Any Home Visits or Center-Based Child Care***	95.0	58.1	36.9***		91.1	58.0	33.1***
More Than 1 Home Visit or 2 Weeks Center-Based Child Care***	93.5	50.8	42.7***		90.4	52.7	37.7***
Home Visits or Center Care at Required Intensity in at Least 1 Followup***	79.3	18.0	61.3***		69.0	11.9	57.1***
Home Visits or Center Care at Required Intensity in All 3 Followups***	40.4	4.7	35.7***		22.4	3.0	19.5***
Home Visits							
Any Home Visits***	89.2	30.9	58.3***		85.6	35.9	49.8***
Any Child Development Services During Home Visits***	88.0	28.4	59.6***		84.9	33.6	51.3***
Weekly Home Visits, 1st Follow-Up Period***	45.2	4.5	40.7***		45.1	2.8	42.3***
Weekly Home Visits, 2nd Follow-Up Period***	36.9	2.8	34.0***		34.0	2.1	31.8***
Weekly Home Visits, 3rd Follow-Up Period***	29.1	3.0	26.2***		28.0	2.2	25.8***
Weekly Home Visits in at Least 1 Followup***	51.2	6.3	45.0***		60.0	5.0	55.0***
Weekly Home Visits in All 3 Followups***	23.5	1.4	22.1***		15.0	0.4	14.6***
Child Care							
Any Child Care***	87.5	83.5	4.0*		84.6	78.4	6.3***
Any Center-Based Child Care***	53.9	37.0	16.9***		47.9	34.5	13.5***
Average Hours per Week of Center-Based Care	8.0	3.9	4.1***		4.8	2.7	2.1***
Concurrent Child Care Arrangements***	61.1	56.7	4.4		44.4	37.2	7.3**
Average Weekly Out-of-Pocket Cost of Care	$4.01	$8.18	-$4.17***		$4.60	$6.60	-$2.00**
Received a Child Care Subsidy***	25.1	31.7	-6.6*		31.7	33.7	-2.0
Child was in Care at 12 Months of Age***	72.6	65.2	7.4**		62.3	50.0	12.3**
Child was in Care at 24 Months of Age***	65.1	61.6	3.5		60.6	49.1	11.5***
Case Management							
Any Case Management Meetings***	90.8	70.6	20.3***		84.2	44.7	39.5***
Weekly Case Management, 1st Follow-Up Period***	51.4	12.7	38.8***		42.4	6.4	36.0***
Weekly Case Management, 2nd Follow-Up Period***	41.3	6.3	34.9***		29.5	4.1	25.4***
Weekly Case Management, 3rd Follow-Up Period***	33.5	5.9	27.7***		25.3	3.7	21.6***
Group Activities							
Any Group Parenting Activities***	73.1	38.2	34.9***		69.0	37.1	31.9***
Any Parent-Child Group Activities**	40.8	14.4	26.3***		41.9	14.4	27.4***

TABLE E.IV.8 (*continued*)

	Mothers of Children Under 1 Required to Work				Mothers of Children Under 1 Not Required to Work		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Early Intervention Services							
Identification of Child's Disability***	10.4	7.6	2.9		5.1	4.1	1.0
Services for Child with Disability***	6.7	4.6	2.2		3.2	2.8	0.4
Child Health Services							
Any Child Health Services***	100.0	99.8	0.2		100.0	99.8	0.2
Any Doctor Visits***	99.6	99.6	-0.0		98.6	97.4	1.2
Any Emergency Room Visits***	61.1	57.5	3.6		49.5	50.4	-1.0
Number of Emergency Room Visits for Injuries	0.3	0.3	-0.0		0.2	0.2	-0.0
Any Dentist Visits***	33.4	26.2	7.2**		24.9	26.0	-1.1
Any Screening Tests***	59.2	59.8	-0.6		72.1	71.2	1.0
Any Immunizations***	98.7	97.7	1.0		98.8	97.9	1.0
Family Development Services							
Any Education-Related Services***	87.6	63.9	23.7***		86.8	55.2	31.7***
Any Employment-Related Services***	78.1	48.4	29.6***		75.9	44.9	31.0***
Any Family Health Services[c]	100.0	100.0	0.0		100.0	100.0	0.0
Any Family Mental Health Services***	28.1	21.1	6.9**		18.9	21.5	-2.7
Transportation Assistance***	32.4	25.0	7.4**		33.4	21.5	11.9***
Housing Assistance***	57.7	51.8	5.9*		58.4	60.3	-1.8
Sample Size	**468**	**438**	**906**		**608**	**573**	**1,181**

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroups are included in the estimates for each subgroup.

[a]Home visits, case management, center-based child care, and/or group parenting activities.

[b]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups in the first two columns.

[c]There is no variance across subgroups due to lack of variance in level of services.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

AFDC = Aid to Families with Dependent Children
TANF = Temporary Assistance for Needy Families

TABLE E.IV.9

IMPACTS ON SERVICE RECEIPT DURING THE FIRST 28 MONTHS, BY WHETHER PROGRAM IS LOCATED IN AN URBAN AREA

	Urban Sites				Rural or Non-Urban Sites		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Any Services							
Any Key Services***[a,b]	94.4	78.4	16.0***		98.4	89.5	8.9***
Any Home Visits or Center-Based Child Care***	92.2	56.3	35.9***		94.4	61.6	32.8***
More Than 1 Home Visit or 2 Weeks Center-Based Child Care***	91.2	50.8	40.3***		93.6	53.7	39.9***
Home Visits or Center Care at Required Intensity in at Least 1 Followup***	73.1	11.8	61.3***		75.1	19.0	56.1***
Home Visits or Center Care at Required Intensity in All 3 Followups***	26.3	1.8	24.4***		39.1	7.4	31.7***
Home Visits							
Any Home Visits***	86.4	34.3	52.1***		88.6	32.5	56.1***
Any Child Development Services During Home Visits***	85.6	31.0	54.5***		87.6	32.4	55.2***
Weekly Home Visits, 1st Follow-Up Period***	47.9	3.5	44.4***		39.3	2.7	36.6***
Weekly Home Visits, 2nd Follow-Up Period***	35.2	2.6	32.6***		34.7	2.5	32.2***
Weekly Home Visits, 3rd Follow-Up Period***	27.3	2.5	24.8***		32.1	2.1	29.9***
Weekly Home Visits in at Least 1 Followup***	59.2	5.7	53.5***		49.7	5.1	44.7***
Weekly Home Visits in All 3 Followups***	17.1	0.5	16.7***		22.1	1.2	20.9***
Child Care							
Any Child Care***	87.1	80.8	6.3***		83.5	78.9	4.6
Any Center-Based Child Care***	46.3	33.7	12.6***		60.0	39.9	20.1***
Average Hours per Week of Center-Based Care	5.6	2.4	3.2***		7.6	4.6	3.0***
Concurrent Child Care Arrangements***	48.8	43.8	5.0*		56.9	49.1	7.8*
Average Weekly Out-of-Pocket Cost of Care	$5.27	$7.73	-$2.46***		$2.34	$5.86	-$3.51***
Received a Child Care Subsidy***	32.0	34.5	-2.5		24.1	26.3	-2.1
Child was in Care at 12 Months of Age***	67.0	53.3	13.7***		66.4	62.1	4.3
Child was in Care at 24 Months of Age***	63.0	52.9	10.1***		62.1	56.3	5.8
Case Management							
Any Case Management Meetings***	85.5	53.1	32.4***		89.7	61.3	28.4***
Weekly Case Management, 1st Follow-Up Period***	47.9	9.8	38.1***		41.8	7.2	34.6***
Weekly Case Management, 2nd Follow-Up Period***	35.4	5.8	29.6***		29.7	5.1	24.6***
Weekly Case Management, 3rd Follow-Up Period***	26.3	5.2	21.1***		34.6	3.1	31.5***
Group Activities							
Any Group Parenting Activities***	68.2	35.3	32.9***		77.5	42.1	35.4***
Any Parent-Child Group Activities**	37.8	15.5	22.3***		50.8	11.1	39.7***

TABLE E.IV.9 (*continued*)

	Urban Sites				Rural or Non-Urban Sites		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Early Intervention Services							
Identification of Child's Disability***	7.2	5.7	1.5		7.2	5.5	1.7
Services for Child with Disability***	4.6	3.4	1.1		4.4	4.4	-0.0
Child Health Services							
Any Child Health Services***	100.0	99.9	0.1		100.0	99.5	0.5
Any Doctor Visits***	99.3	99.2	0.1		97.9	96.4	1.4
Any Emergency Room Visits***	55.3	55.1	0.2		50.6	50.2	0.4
Number of Emergency Room Visits for Injuries	0.2	0.3	-0.1		0.2	0.3	-0.0
Any Dentist Visits***	25.1	25.8	-0.7		35.9	27.0	8.9**
Any Screening Tests***	66.8	68.8	-2.0		66.9	60.9	6.0
Any Immunizations***	99.2	98.3	1.0		97.9	96.4	1.5
Family Development Services							
Any Education-Related Services***	87.7	58.4	29.3***		85.8	59.7	26.1***
Any Employment-Related Services***	77.4	48.4	29.0***		75.7	41.2	34.5***
Any Family Health Services[c]	100.0	100.0	0.0		100.0	100.0	0.0
Any Family Mental Health Services***	23.3	23.6	-0.3		20.0	17.0	3.0
Transportation Assistance***	35.8	26.2	9.6***		26.3	14.9	11.4***
Housing Assistance***	62.5	61.3	1.2		48.2	45.5	2.8
Sample Size	**741**	**720**	**1,461**		**335**	**291**	**626**

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroups are included in the estimates for each subgroup.

[a]Home visits, case management, center-based child care, and/or group parenting activities.

[b]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups in the first two columns.

[c]There is no variance across subgroups due to lack of variance in level of services.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

APPENDIX E.VI

TABLE E.VI.1

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY PROGRAM APPROACH IN 1997

	Center-Based Programs					Mixed-Approach Programs					Home-Based Programs			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development														
Bayley Mental Development Index (MDI) Standard Score	89.8	88.9	0.9	7.2		89.3	87.9	1.4	10.9		94.1	92.8	1.2	9.5
Percentage with MDI < 85***[d]	26.5	36.1	-9.7	-20.7		36.1	38.4	-2.2	-4.8		20.5	22.0	-1.4	-3.1
Peabody Picture Vocabulary Test (PPVT)-III Standard Score	83.2	81.8	1.5	9.1		82.2	78.5	3.7**	22.6		84.6	83.1	1.5	9.1
Percentage with PPVT-III < 85***	52.4	54.7	-2.3	-4.5		56.0	67.7	-11.6**	-23.3		45.6	48.6	-3.0	-6.1
Child Social-Emotional Development														
Engagement of Parent During Parent-Child Semistructured Play	4.9	4.7	0.2	17.4		4.7	4.4	0.3***	29.5		4.8	4.6	0.2**	19.2
Sustained Attention with Objects During Parent-Child Semistructured Play	5.0	5.0	0.0	0.5		5.0	4.7	0.3***	30.8		5.0	4.9	0.1	10.6
Engagement of Parent During Parent-Child Puzzle Challenge Task	5.0	4.9	0.1	8.0		5.0	4.9	0.1	14.2		5.1	5.0	0.1	5.6
Persistence During Parent-Child Puzzle Challenge Task	4.4	4.3	0.1	9.1		4.5	4.4	0.0	3.5		4.7	4.6	0.1	12.0
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	4.0	4.0	0.0	1.1		4.0	4.1	-0.1	-7.9		4.0	4.0	0.0	2.1
Bayley BRS: Orientation/ Engagement	3.9	3.9	0.1	9.6		3.9	3.9	-0.1	-9.5		3.9	3.8	0.0	3.4
Negativity Toward Parent During Parent-Child Semistructured Play	1.2	1.4	-0.2**	-27.1		1.3	1.3	-0.1	-15.3		1.3	1.3	-0.0	-6.6
Frustration During Parent-Child Puzzle Challenge Task	2.5	2.7	-0.2	-14.9		2.8	2.7	0.1	10.3		2.7	2.6	0.1	5.9
Child Behavior Checklist—Aggressive Behavior	9.6	10.8	-1.2	-18.1		10.7	11.3	-0.6	-9.3		11.2	11.7	-0.5	-7.8

TABLE E.VI.1 (*continued*)

Outcome	Center-Based Programs: Program Group Participants	Center-Based Programs: Control Group[a]	Center-Based Programs: Impact Estimate per Participant[b]	Center-Based Programs: Effect Size[c]	Mixed-Approach Programs: Program Group Participants	Mixed-Approach Programs: Control Group[a]	Mixed-Approach Programs: Impact Estimate per Participant[b]	Mixed-Approach Programs: Effect Size[c]	Home-Based Programs: Program Group Participants	Home-Based Programs: Control Group[a]	Home-Based Programs: Impact Estimate per Participant[b]	Home-Based Programs: Effect Size[c]
Child Health Status												
Child's Health Status	3.9	4.1	-0.2	-17.1	4.1	4.1	0.0	2.3	4.0	4.0	-0.0	-4.0
Percentage of Children in Fair or Poor Health***	9.9	6.7	3.2	11.1	5.4	6.0	-0.6	-2.1	9.8	9.6	0.2	0.8
Quality of the Home Environment and Parenting: Overall and Physical Environment												
Home Observation for Measurement of the Environment (HOME) Total Score	27.3	26.4	0.9	18.8	27.0	26.4	0.6	11.3	28.3	28.1	0.2	3.5
HOME Internal Physical Environment	7.7	7.5	0.1	8.6	7.7	7.8	-0.1	-3.7	8.0	8.0	-0.0	-1.6
Parenting Behavior: Emotional Support												
HOME Warmth	2.6	2.4	0.1	15.4	2.4	2.3	0.1	9.3	2.7	2.7	-0.0	-0.8
Supportiveness During Parent-Child Semistructured Play	4.1	4.0	0.1	8.9	4.0	3.8	0.2**	20.8	4.0	3.9	0.1**	15.5
Supportive Presence During Parent-Child Puzzle Challenge Task	4.5	4.5	-0.1	-4.2	4.4	4.2	0.2	14.7	4.6	4.5	0.1	7.3
Parenting Behavior: Stimulation of Language and Learning												
Percentage of Children with a Regular Bedtime***	58.7	57.0	1.8	3.6	59.3	62.4	-3.1	-6.2	59.3	55.6	3.6	7.4
Percentage of Children Who Follow a Bedtime Routine*	67.1	66.1	1.0	2.2	67.9	66.8	1.1	2.4	72.0	71.0	1.0	2.2
HOME: Support of Language and Learning	10.7	10.5	0.3	13.0	10.3	10.1	0.2	9.2	10.9	10.7	0.2	7.0
Parent-Child Play**	4.6	4.3	0.2*	25.7	4.4	4.2	0.2*	18.1	4.4	4.4	-0.1	-5.5
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.6	3.5	0.0	3.7	3.6	3.3	0.3**	24.8	3.6	3.5	0.0	2.7
Percentage of Parents Who Read to Child Daily***	57.9	50.8	7.0	14.1	59.0	45.0	14.0***	28.0	54.5	55.7	-1.2	-2.4
Percentage of Parents Who Read to Child at Bedtime***	30.6	32.4	-1.7	-3.8	36.7	30.8	5.9	13.0	29.6	25.8	3.8	8.4

TABLE E.VI.1 (*continued*)

Outcome	Center-Based Programs: Program Group Participants	Center-Based Programs: Control Group[a]	Center-Based Programs: Impact Estimate per Participant[b]	Center-Based Programs: Effect Size[c]	Mixed-Approach Programs: Program Group Participants	Mixed-Approach Programs: Control Group[a]	Mixed-Approach Programs: Impact Estimate per Participant[b]	Mixed-Approach Programs: Effect Size[c]	Home-Based Programs: Program Group Participants	Home-Based Programs: Control Group[a]	Home-Based Programs: Impact Estimate per Participant[b]	Home-Based Programs: Effect Size[c]
Parenting Behavior: Negative Parenting Behavior												
Detachment During Parent-Child Semistructured Play**	1.2	1.1	0.1	16.2	1.2	1.4	-0.2**	-23.8	1.2	1.3	-0.1	-9.4
Intrusiveness During Parent-Child Semistructured Play	1.5	1.6	-0.1	-13.9	1.6	1.7	-0.0	-3.3	1.6	1.6	-0.1	-6.4
Detachment During Parent-Child Puzzle Challenge Task	1.6	1.6	0.0	4.7	1.7	1.9	-0.2	-16.4	1.6	1.6	-0.0	-3.5
Intrusiveness During Parent-Child Puzzle Challenge Task	2.8	2.7	0.1	4.3	2.8	2.9	-0.1	-10.8	2.5	2.6	-0.1	-8.7
Negative Regard During Parent-Child Semistructured Play	1.3	1.3	0.0	1.2	1.3	1.3	0.0	6.0	1.2	1.3	-0.1	-9.5
HOME Harshness	0.3	0.3	0.0	3.3	0.2	0.2	0.0	1.1	0.3	0.3	0.0	5.6
Percentage of Parents Who Spanked Child in the Past Week***	51.4	61.0	-9.6	-19.2	46.6	57.6	-10.9**	-21.9	44.1	49.6	-5.5	-10.9
Knowledge of Safety Practices and Discipline Strategies												
Percentage of Parents Who Usually Use a Car Seat Correctly***	63.0	75.3	-12.3**	-26.8	73.7	71.6	2.2	4.7	70.4	69.4	1.0	2.2
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	52.0	60.6	-8.6	-17.2	43.9	53.5	-9.6**	-19.2	44.9	44.5	0.4	0.8
Percentage of Parents Who Would Use Mild Discipline Only***	36.8	30.9	5.9	11.9	49.2	39.1	10.1***	20.5	45.8	45.9	-0.1	-0.2
Index of Severity of Discipline Strategies	3.6	3.9	-0.2	-14.0	3.2	3.6	-0.4***	-22.6	3.3	3.3	-0.0	-1.8
Parent Physical and Mental Health												
Parent's Health Status	3.5	3.5	-0.0	-2.5	3.5	3.5	-0.1	-5.3	3.4	3.4	-0.1	-5.9
Parenting Stress Index (PSI) Parental Distress	23.9	25.0	-1.1	-11.7	24.8	25.9	-1.1	-11.2	24.9	26.3	-1.4**	-14.4
PSI Parent-Child Dysfunctional Interaction	17.6	17.2	0.4	7.0	18.1	17.7	0.4	6.7	17.5	18.1	-0.6	-10.4

TABLE E.VI.1 (*continued*)

Outcome	Center-Based Programs: Program Group Participants	Center-Based Programs: Control Group[a]	Center-Based Programs: Impact Estimate per Participant[b]	Center-Based Programs: Effect Size[c]	Mixed-Approach Programs: Program Group Participants	Mixed-Approach Programs: Control Group[a]	Mixed-Approach Programs: Impact Estimate per Participant[b]	Mixed-Approach Programs: Effect Size[c]	Home-Based Programs: Program Group Participants	Home-Based Programs: Control Group[a]	Home-Based Programs: Impact Estimate per Participant[b]	Home-Based Programs: Effect Size[c]
Center for Epidemiological Studies Depression (CES-D; Short Form)	7.3	7.1	0.2	2.6	7.2	7.8	-0.6	-8.2	7.7	7.9	-0.1	-1.8
CES-D Severe Depressive Symptoms***	15.8	8.7	7.1*	19.8	14.2	15.3	-1.2	-3.2	14.4	16.1	-1.6	-4.5
Family Environment Scale (FES): Family Conflict	1.6	1.7	-0.1	-11.1	1.7	1.7	-0.0	-4.6	1.7	1.7	-0.0	-0.8
Father Presence												
Currently Married to Biological Father***	28.4	29.7	-1.2	-2.5	34.5	35.1	-0.6	-1.2	38.1	40.0	-1.9	-3.9
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	46.0	48.2	-2.2	-4.3	46.0	46.9	-0.9	-1.9	52.9	56.0	-3.1	-6.2
Biological Father Currently Present in Child's Life***	75.9	71.9	4.0	8.9	70.6	68.7	1.9	4.3	72.9	75.7	-2.8	-6.3
Continuous Biological Father Presence Child Age 14-36 Months***	71.7	68.5	3.2	6.9	64.3	66.2	-1.9	-4.2	67.6	72.0	-4.5	-9.8
No Biological Father Presence Child Age 14-36 Months***	7.3	10.6	-3.3	-10.4	15.6	14.8	0.8	2.5	12.0	10.0	2.0	6.4
Continuous Male Presence Child Age 14-36 Months***	80.8	82.7	-1.9	-5.3	79.4	79.0	0.3	0.9	78.9	85.9	-7.0**	-19.4
No Male Presence Child Age 14-36 Months***	1.1	1.7	-0.6	-5.3	3.0	1.5	1.5	12.5	2.4	1.3	1.1	9.0
Sample Size												
Bayley	**217**	**172**	**389**		**266**	**257**	**523**		**396**	**350**	**746**	
Parent Interview	**254**	**211**	**465**		**351**	**344**	**695**		**502**	**448**	**950**	
Parent-Child Interactions	**227**	**181**	**408**		**251**	**255**	**506**		**396**	**348**	**744**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

TABLE E.VI.1 (*continued*)

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.2

IMPACTS ON SELF-SUFFICIENCY AT 28 MONTHS, BY PROGRAM APPROACH IN 1997

	Center-Based Programs					Mixed-Approach Programs					Home-Based Programs			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Education/Job Training														
Ever in Education or Training***[d]	65.1	61.5	3.6	7.2		65.1	51.3	13.8***	27.7		53.1	45.5	7.6**	15.3
Ever in High School***	13.1	11.6	1.5	5.2		15.1	10.6	4.6*	16.0		12.6	6.8	5.7***	20.1
Ever in ESL Class***	1.5	2.7	-1.3	-8.9		5.0	3.3	1.7	11.9		3.4	2.4	1.0	7.2
Ever in Vocational Program***	19.3	17.9	1.5	3.9		22.7	17.6	5.1	13.6		18.2	15.7	2.5	6.6
Average Hours per Week in Education or Training	5.4	5.0	0.5	7.1		4.2	3.3	0.9*	14.5		4.5	3.0	1.6***	24.3
In Education or Training:														
1st Quarter***	24.9	29.6	-4.6	-11.2		22.5	19.0	3.4	8.3		21.2	21.6	-0.4	-1.0
2nd Quarter***	31.4	34.7	-3.3	-7.7		27.1	22.1	5.1	11.8		25.1	22.9	2.2	5.0
3rd Quarter***	37.7	31.7	6.0	13.6		31.3	24.9	6.5*	14.7		28.2	26.5	1.7	3.8
4th Quarter***	38.0	31.0	6.9	16.2		31.4	25.0	6.5*	15.1		27.1	22.5	4.6*	10.7
5th Quarter***	35.5	30.2	5.2	12.1		29.8	27.1	2.8	6.4		28.6	22.9	5.8**	13.4
6th Quarter***	34.3	27.8	6.5	15.6		27.5	23.2	4.4	10.5		28.7	21.3	7.4***	17.9
7th Quarter***	31.2	28.7	2.5	6.3		26.5	23.5	3.0	7.5		23.1	17.6	5.5**	13.7
8th Quarter***	29.3	28.2	1.1	2.9		27.6	20.4	7.2*	18.4		24.3	15.6	8.7***	22.1
Have High School Diploma ***	52.4	13.3	-0.5	-1.5		50.2	48.9	1.3	2.5		49.1	45.7	3.5	6.9
Have GED***	12.8	56.9	-4.6	-9.1		10.1	8.4	1.7	5.5		8.5	11.5	-2.9	-9.2
Employment														
Ever Employed***	91.3	87.3	4.1	10.8		88.6	82.0	6.6**	17.5		83.1	81.8	1.3	3.5
Average Hours/Week Employed	21.6	21.3	0.3	2.1		16.8	15.6	1.2	7.9		14.8	15.1	-0.3	-2.0
Employed in:														
1st Quarter***	53.4	49.4	4.0	8.2		35.5	35.6	-0.1	-0.2		33.8	36.1	-2.2	-4.6
2nd Quarter***	59.4	54.5	4.9	9.8		45.3	41.8	3.5	7.0		38.2	42.9	-4.7	-9.5
3rd Quarter***	63.5	58.9	4.6	9.3		52.8	50.0	2.8	5.7		46.9	50.1	-3.3	-6.5
4th Quarter***	66.4	63.3	3.1	6.2		56.4	52.6	3.8	7.6		51.9	51.7	0.2	0.3
5th Quarter***	71.0	66.4	4.6	9.4		60.3	55.1	5.3	10.7		57.7	58.9	-1.2	-2.4
6th Quarter***	71.3	66.7	4.7	9.5		62.3	55.5	6.8	13.8		61.7	58.2	3.5	7.0
7th Quarter***	64.0	64.9	-0.9	-1.9		61.2	53.7	7.5*	15.1		57.5	55.0	2.4	4.9
8th Quarter***	70.4	67.3	3.1	6.4		67.2	56.8	10.4**	21.3		55.9	59.9	-4.0	-8.1
Any Self-Sufficiency-Oriented Activity (Education, Training, or Employment)														
Ever Employed or in Education/Training***	97.7	94.6	3.1	10.1		95.6	90.1	5.5**	18.2		90.5	88.9	1.6	5.4
Average Hours per Week in Any Activity	28.2	26.8	1.4	8.9		21.3	19.2	2.1	13.6		19.9	18.5	1.3	8.5
In Activities in:														
1st Quarter***	68.0	67.9	0.1	0.2		51.0	48.1	3.0	5.9		47.3	48.4	-1.1	-2.2
2nd Quarter***	78.9	72.8	6.1	12.3		61.8	54.1	7.7**	15.5		53.4	55.5	-2.1	-4.2

TABLE E.VI.2 (*continued*)

Outcome	Center-Based Programs: Program Group Participants	Center-Based Programs: Control Group[a]	Center-Based Programs: Impact Estimate per Participant[b]	Center-Based Programs: Effect Size[c]	Mixed-Approach Programs: Program Group Participants	Mixed-Approach Programs: Control Group[a]	Mixed-Approach Programs: Impact Estimate per Participant[b]	Mixed-Approach Programs: Effect Size[c]	Home-Based Programs: Program Group Participants	Home-Based Programs: Control Group[a]	Home-Based Programs: Impact Estimate per Participant[b]	Home-Based Programs: Effect Size[c]
3rd Quarter***	83.8	76.1	7.6*	16.1	70.4	63.3	7.1*	14.9	62.3	62.9	-0.6	-1.3
4th Quarter***	86.1	75.9	10.2**	21.4	71.7	64.5	7.2*	15.0	65.2	61.6	3.6	7.6
5th Quarter***	85.4	78.5	6.8	14.8	73.8	67.1	6.7*	14.5	69.6	67.9	1.7	3.6
6th Quarter***	88.2	76.3	12.0**	25.5	74.5	65.7	8.8**	18.6	72.9	66.4	6.5**	13.9
7th Quarter***	81.1	76.1	5.0	10.5	71.7	64.1	7.6*	16.0	66.4	62.7	3.7	7.6
8th Quarter***	84.8	77.2	7.6	16.3	77.2	65.1	12.1***	25.9	65.2	66.6	-1.4	-3.1
AFDC/TANF Receipt												
Ever Received AFDC/TANF***	32.7	28.6	4.1	8.2	46.8	45.7	1.1	2.2	55.2	52.5	2.7	5.5
Received AFDC/TANF in:												
1st Quarter***	21.4	18.2	3.2	6.9	32.9	29.6	3.3	7.0	42.2	29.4	2.7	5.8
2nd Quarter***	28.1	17.8	3.4	7.1	34.5	32.4	2.1	4.5	41.9	42.4	-0.5	-1.1
3rd Quarter***	19.1	20.8	-1.7	-3.5	36.9	33.0	3.9	8.1	46.2	43.9	2.3	4.7
4th Quarter***	18.3	17.4	0.8	1.8	30.4	26.5	3.8	8.2	37.2	38.1	-0.9	-1.9
5th Quarter***	18.0	14.7	3.3	7.2	30.0	27.0	3.0	6.5	36.0	37.8	-1.8	-3.9
6th Quarter***	19.4	16.0	3.4	7.4	26.6	26.7	-0.0	-0.1	36.4	38.5	-2.1	-4.5
7th Quarter***	14.4	14.5	-0.0	-0.0	23.1	23.1	-0.1	-0.1	27.4	32.1	-4.7*	-10.8
8th Quarter***	15.5	13.0	2.5	5.9	19.9	23.6	-3.7	-8.6	27.8	27.8	0.0	0.0
Total AFDC/TANF Benefits ($)	$908	$767	$142	3.7	$2,331	$2,111	$220	5.7	$2,676	$2,834	-$158	-4.1
Receipt of Other Welfare Benefits												
Ever Received Welfare***	63.0	62.6	0.3	0.7	66.0	64.0	2.0	4.3	72.9	70.5	2.5	5.2
Total Welfare Benefits ($)	$3,963	$4,478	-$515	-6.8	$5,422	$5,851	-$429	-5.7	$5,929	$6,089	-$160	-2.1
Ever Received Food Stamps***	53.9	53.2	0.7	1.5	58.2	56.5	1.7	3.5	66.7	65.4	1.3	2.6
Total Food Stamp Benefits ($)	$1,636	$1,994	-$358	-13.2	$2,152	$2,023	$129	4.7	$2,298	$2,153	$145	5.3
Income/Poverty												
Income Above Poverty Level***	47.8	51.0	-3.2	-6.5	41.9	43.5	-1.6	-3.3	41.1	40.8	0.3	0.5
Subsequent Births												
Subsequent Birth by 24 Months after Random Assignment***	15.1	18.9	-3.8	-8.4	24.6	30.5	-5.9	-13.2	26.3	28.4	-2.1	-4.7
Sample Size	**230**	**204**	**434**		**358**	**354**	**712**		**488**	**453**	**941**	

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

TABLE E.VI.2 (*continued*)

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.3

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY PATTERN OF PROGRAM IMPLEMENTATION

	Early Implementers				Later Implementers				Incomplete Implementers			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development												
Bayley Mental Development Index (MDI) Standard Score	94.1	92.0	2.2*	16.7	88.2	86.0	2.2**	16.9	92.1	92.1	-0.1	-0.4
Percentage with MDI < 85***[d]	24.1	27.0	-5.6	-11.9	36.5	43.1	-6.6	-14.2	23.8	25.8	-2.0	-4.3
Peabody Picture Vocabulary Test (PPVT)-III Standard Score	86.0	84.8	1.3	7.9	78.4	75.2	3.3*	20.0	84.8	83.2	1.6	9.9
Percentage with PPVT-III < 85***	43.1	50.5	-7.5	-15.0	65.4	71.2	-5.8	-11.7	46.6	51.9	-5.3	-10.6
Child Social-Emotional Development												
Engagement of Parent During Parent-Child Semistructured Play	4.9	4.8	0.1	11.1	4.7	4.5	0.2**	22.0	4.9	4.5	0.4***	36.7
Sustained Attention with Objects During Parent-Child Semistructured Play	5.1	5.0	0.1	14.3	4.8	4.7	0.1	13.3	5.0	4.8	0.2*	22.0
Engagement of Parent During Parent-Child Puzzle Challenge Task	5.1	5.0	0.1	7.1	4.9	4.9	0.1	5.3	5.1	4.9	0.2	17.5
Persistence During Parent-Child Puzzle Challenge Task	4.7	4.7	-0.0	-2.0	4.4	4.4	0.1	8.3	4.6	4.4	0.2	19.4
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	4.0	4.0	0.0	2.6	4.0	3.9	0.1	9.1	4.0	4.1	-0.1	-10.5
Bayley BRS: Orientation/ Engagement	4.0	4.0	0.1	8.5	3.6	3.6	0.1	6.8	3.9	3.9	0.0	0.8
Negativity Toward Parent During Parent-Child Semistructured Play	1.2	1.3	-0.1**	-17.7	1.3	1.3	-0.1	-9.3	1.3	1.3	-0.1	-10.6
Frustration During Parent-Child Puzzle Challenge Task	2.8	2.9	-0.0	-2.3	2.6	2.5	0.2	13.6	2.6	2.6	0.0	0.3

TABLE E.VI.3 (*continued*)

Outcome	Early Implementers: Program Group Participants	Early Implementers: Control Group[a]	Early Implementers: Impact Estimate per Participant[b]	Early Implementers: Effect Size[c]	Later Implementers: Program Group Participants	Later Implementers: Control Group[a]	Later Implementers: Impact Estimate per Participant[b]	Later Implementers: Effect Size[c]	Incomplete Implementers: Program Group Participants	Incomplete Implementers: Control Group[a]	Incomplete Implementers: Impact Estimate per Participant[b]	Incomplete Implementers: Effect Size[c]
Child Behavior Checklist—Aggressive Behavior	11.1	11.8	-0.7	-11.4	10.8	11.0	-0.2	-3.4	9.8	11.6	-1.8***	-28.2
Child Health Status												
Child's Health Status	4.1	4.1	-0.0	-3.4	4.0	3.9	0.1	10.2	4.0	4.1	-0.1	-10.4
Percentage of Children in Fair or Poor Health***	7.4	6.9	0.4	1.5	8.7	11.4	-2.7	-9.4	8.2	8.1	0.1	0.2
Quality of the Home Environment and Parenting: Overall and Physical Environment												
Home Observation for Measurement of the Environment (HOME) Total Score	28.3	27.3	1.0**	19.5	26.3	26.1	0.2	3.9	28.3	27.9	0.5	9.2
HOME Internal Physical Environment	7.9	7.7	0.2	12.2	7.7	7.8	-0.2	-11.5	7.9	7.8	0.1	8.1
Parenting Behavior: Emotional Support												
HOME Warmth	2.5	2.4	0.2**	18.4	2.5	2.4	0.1	7.2	2.7	2.7	0.0	1.0
Supportiveness During Parent-Child Semistructured Play	4.1	4.1	0.0	4.6	3.8	3.6	0.2**	19.9	4.1	3.8	0.2*	22.6
Supportive Presence During Parent-Child Puzzle Challenge Task	4.9	4.8	0.1	10.7	4.1	4.1	0.0	0.6	4.4	4.4	0.0	2.3
Parenting Behavior: Stimulation of Language and Learning												
Percentage of Children with a Regular Bedtime***	63.3	63.6	-0.2	-0.4	55.9	51.9	4.0	8.1	59.3	59.9	-0.6	-1.2
Percentage of Children Who Follow a Bedtime Routine***	72.2	70.3	1.9	4.1	66.6	66.3	0.2	0.5	70.0	69.6	0.4	0.9
HOME: Support of Language and Learning	10.8	10.6	0.2	7.8	10.2	9.8	0.3**	16.2	11.0	11.0	0.0	0.2
Parent-Child Play	4.4	4.3	0.1*	13.9	4.4	4.3	0.1	11.6	4.4	4.5	-0.0	-0.7
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.9	3.9	0.1	4.3	3.4	3.2	0.2**	19.7	3.4	3.4	0.0	3.3
Percentage of Parents Who Read to Child Daily***	63.3	52.0	11.3***	22.6	49.5	43.3	6.2	12.3	57.6	58.9	-1.3	-2.7

TABLE E.VI.3 (*continued*)

	Early Implementers					Later Implementers					Incomplete Implementers			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Percentage of Parents Who Read to Child at Bedtime***	40.9	34.6	6.3	13.9		27.1	20.7	6.5*	14.2		28.1	31.0	-2.8	-6.2
Parenting Behavior: Negative Parenting Behavior														
Detachment During Parent-Child Semistructured Play**	1.2	1.2	0.0	2.0		1.2	1.3	-0.1*	-17.5		1.2	1.2	-0.1	-9.8
Intrusiveness During Parent-Child Semistructured Play	1.4	1.5	-0.1	-6.7		1.7	1.7	-0.0	-2.3		1.7	1.7	-0.1	-7.0
Detachment During Parent-Child Puzzle Challenge Task	1.6	1.6	-0.0	-3.0		1.7	1.7	-0.0	-2.4		1.6	1.7	-0.1	-4.9
Intrusiveness During Parent-Child Puzzle Challenge Task	2.5	2.5	0.0	0.0		2.9	3.1	-0.2*	-16.6		2.6	2.6	-0.0	-1.8
Negative Regard During Parent-Child Semistructured Play	1.3	1.3	0.0	2.4		1.3	1.3	-0.0	-3.5		1.3	1.3	-0.0	-0.4
HOME Harshness**	0.2	0.3	-0.1	-12.1		0.4	0.2	0.1**	20.6		0.3	0.3	-0.0	-1.0
Percentage of Parents Who Spanked Child in the Past Week***	44.0	52.2	-8.1*	-16.3		46.8	55.7	-8.9**	-17.9		49.6	56.7	-7.2	-14.4
Knowledge of Safety Practices and Discipline Strategies														
Percentage of Parents Who Usually Use a Car Seat Correctly***	73.3	73.9	-0.5	-1.2		72.3	74.8	-2.5	-5.4		62.3	68.8	-6.5	-14.2
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	31.5	42.0	-10.5***	-20.9		54.4	59.3	-4.9	-9.7		54.2	55.8	-1.6	-3.2
Percentage of Parents Who Would Use Mild Discipline Only***	58.8	49.5	9.3**	18.8		37.3	30.2	7.1*	14.4		36.8	37.9	-1.1	-2.3
Index of Severity of Discipline Strategies	2.9	3.3	-0.4***	-23.3		3.6	3.9	-0.2**	-14.7		3.6	3.6	-0.0	-1.2
Parent Physical and Mental Health														
Parent's Health Status	3.4	3.5	-0.1	-6.7		3.4	3.3	0.1	11.0		3.5	3.6	-0.1	-13.4
Parenting Stress Index (PSI) Parental Distress	24.3	25.0	-0.7	-7.7		25.9	26.3	-0.5	-5.0		23.8	25.5	-1.7*	-17.6

TABLE E.VI.3 (*continued*)

Outcome	Early Implementers: Program Group Participants	Early Implementers: Control Group[a]	Early Implementers: Impact Estimate per Participant[b]	Early Implementers: Effect Size[c]	Later Implementers: Program Group Participants	Later Implementers: Control Group[a]	Later Implementers: Impact Estimate per Participant[b]	Later Implementers: Effect Size[c]	Incomplete Implementers: Program Group Participants	Incomplete Implementers: Control Group[a]	Incomplete Implementers: Impact Estimate per Participant[b]	Incomplete Implementers: Effect Size[c]
PSI Parent-Child Dysfunctional Interaction	18.0	17.6	0.4	6.9	17.8	17.9	-0.2	-2.8	17.4	17.8	-0.5	-7.3
Center for Epidemiological Studies Depression (CES-D; Short Form)	7.6	8.7	-1.1*	-15.5	7.5	7.4	0.1	1.6	7.0	7.1	-0.1	-1.4
CES-D Severe Depressive Symptoms ***	14.9	17.3	-2.4	-6.7	14.5	13.8	0.7	2.1	13.9	13.8	0.1	0.3
Family Environment Scale (FES): Family Conflict	1.7	1.7	-0.0	-8.0	1.7	1.7	0.0	0.5	1.6	1.7	-0.1	-15.2
Father Presence												
Currently Married to Biological Father ***	41.0	40.5	0.5	1.1	35.2	36.2	-1.0	-2.1	26.6	30.4	-3.8	-7.8
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	52.7	52.1	0.7	1.3	47.4	53.2	-5.8	-11.6	46.0	48.8	-2.8	-5.6
Biological Father Currently Present in Child's Life***	71.1	69.9	1.3	2.8	72.7	70.9	1.8	4.0	74.8	72.1	2.8	6.2
Continuous Biological Father Presence Child Age 14-36 Months***	66.1	70.6	-4.6	-9.9	66.5	69.1	-2.7	-5.8	69.0	68.2	0.8	1.7
No Biological Father Presence Child Age 14-36 Months***	14.4	10.2	4.2	13.5	12.2	12.7	-0.5	-1.4	10.3	10.0	0.2	0.8
Continuous Male Presence Child Age 14-36 Months***	78.7	83.9	-5.2	-14.5	79.6	85.3	-5.7	-15.9	80.3	80.7	-0.3	-0.9
No Male Presence Child Age 14-36 Months***	2.2	1.0	1.2	9.7	2.5	1.9	0.6	4.8	1.9	2.1	-0.2	-1.5
Sample Size												
Bayley	**305**	**298**	**603**		**336**	**277**	**613**		**238**	**204**	**442**	
Parent Interview	**388**	**358**	**746**		**418**	**362**	**780**		**301**	**283**	**584**	
Parent-Child Interactions	**306**	**291**	**597**		**348**	**295**	**643**		**220**	**198**	**418**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

TABLE E.VI.3 (*continued*)

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.4

IMPACTS ON SELF-SUFFICIENCY AT 28 MONTHS, BY PATTERN OF IMPLEMENTATION

	Early Implementers				Later Implementers				Incomplete Implementers			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Education/Job Training												
Ever in Education or Training***[d]	60.6	53.2	7.4*	14.8	56.4	51.2	5.1	10.3	63.5	52.0	11.5**	23.0
Ever in High School***	7.4	6.9	0.5	1.7	15.7	11.9	3.8*	13.2	18.5	9.4	9.1***	31.9
Ever in ESL Class***	2.9	3.2	-0.3	-2.4	4.4	3.0	1.3	9.3	3.1	2.2	1.0	6.8
Ever in Vocational Program***	20.5	17.2	3.3	8.7	16.3	17.3	-1.0	-2.7	23.1	18.0	5.1	13.7
Average Hours per Week in Education or Training	3.4	3.1	0.3	4.0	4.5	3.4	1.1**	17.9	6.1	4.2	1.9**	29.8
In Education or Training:												
1st Quarter***	23.6	19.3	4.4	10.6	21.8	23.0	-1.2	-3.0	21.2	26.0	-4.8	-11.7
2nd Quarter***	23.6	23.2	0.4	1.0	27.8	24.2	3.6	8.3	30.3	29.1	1.3	2.9
3rd Quarter***	25.9	23.8	2.1	4.7	30.6	27.3	3.2	7.3	39.0	31.2	7.8*	17.6
4th Quarter***	28.2	23.5	4.8	11.1	29.1	24.2	4.9	11.5	37.0	29.4	7.6*	17.7
5th Quarter***	27.1	25.1	2.1	4.8	29.0	25.8	3.3	7.6	36.5	27.9	8.6**	20.0
6th Quarter***	27.8	24.0	3.7	9.0	25.8	23.7	2.1	5.0	36.2	23.9	12.3***	29.6
7th Quarter***	22.5	22.5	-0.0	-0.1	24.7	22.9	1.8	4.5	32.6	17.8	14.8***	36.9
8th Quarter***	22.1	20.0	2.1	5.3	26.0	21.0	5.0	12.7	32.6	18.1	14.5***	37.1
Have High School Diploma***	56.5	57.0	-0.5	-0.9	37.4	41.4	-4.0	-7.9	58.7	51.6	7.1	14.2
Have GED***	14.0	10.8	3.3	10.3	8.4	6.6	1.8	5.7	7.2	15.4	-8.2**	-25.9
Employment												
Ever Employed***	90.0	84.2	5.8**	15.4	82.3	82.9	-0.6	-1.5	88.0	82.2	5.7	15.3
Average Hours/Week Employed	18.6	17.0	1.6	10.9	15.9	16.9	-1.0	-6.8	16.9	16.8	0.1	0.5
Employed in:												
1st Quarter***	44.5	43.3	1.2	2.5	37.8	35.9	1.9	4.0	33.7	37.2	-3.5	-7.2
2nd Quarter***	53.0	49.8	3.2	6.4	42.8	44.3	-1.5	-3.0	39.8	42.5	-2.8	-5.5
3rd Quarter***	61.8	56.5	5.3	10.6	46.8	50.8	-4.0	-8.0	49.6	50.3	-0.7	-1.4
4th Quarter***	66.4	58.5	7.9**	15.9	50.5	50.7	-0.3	-0.5	52.9	55.1	-2.3	-4.6
5th Quarter***	68.9	59.6	9.3***	18.9	58.5	57.2	1.3	2.7	55.9	60.2	-4.4	-8.9
6th Quarter***	68.1	58.0	10.0**	20.3	59.2	57.3	1.9	3.8	64.7	61.4	3.3	6.7
7th Quarter***	61.4	57.2	4.2	8.4	60.4	57.6	2.8	5.7	59.5	54.9	4.6	9.2
8th Quarter***	66.7	60.1	6.6	13.5	61.3	59.9	1.4	2.8	61.7	64.1	-2.3	-4.8
Any Self-Sufficiency-Oriented Activity (Education, Training or Employment)												
Ever Employed or in Education/Training***	94.8	90.8	4.0*	13.1	91.3	89.9	1.3	4.4	96.1	90.2	5.9**	19.4
Average Hours per Week in Any Activity	22.3	20.8	1.5	9.6	21.2	20.7	0.5	3.2	23.8	21.4	2.4	15.3
In Activities in:												
1st Quarter***	57.8	53.5	4.4	8.8	51.8	50.3	1.5	3.1	49.4	53.9	-4.1	-8.1

TABLE E.VI.4 (*continued*)

Outcome	Early Implementers: Program Group Participants	Early Implementers: Control Group[a]	Early Implementers: Impact Estimate per Participant[b]	Early Implementers: Effect Size[c]	Later Implementers: Program Group Participants	Later Implementers: Control Group[a]	Later Implementers: Impact Estimate per Participant[b]	Later Implementers: Effect Size[c]	Incomplete Implementers: Program Group Participants	Incomplete Implementers: Control Group[a]	Incomplete Implementers: Impact Estimate per Participant[b]	Incomplete Implementers: Effect Size[c]
2nd Quarter***	64.3	59.8	4.4	9.0	60.7	57.8	2.9	5.8	61.8	59.2	2.5	5.1
3rd Quarter***	72.1	69.2	2.9	6.2	64.7	64.3	0.4	0.9	74.9	65.6	9.2**	19.4
4th Quarter***	77.6	68.0	9.7***	20.2	66.4	63.8	2.6	5.4	73.6	66.0	7.5*	15.8
5th Quarter***	77.3	71.2	6.1*	13.2	71.5	68.2	3.3	7.2	74.8	68.9	5.9	12.7
6th Quarter***	77.9	68.9	9.0**	19.1	71.2	66.6	4.5	9.6	82.3	68.3	14.0***	29.8
7th Quarter***	71.1	67.9	3.2	6.8	69.4	65.7	3.7	7.7	76.2	62.3	13.8***	28.9
8th Quarter***	75.1	68.0	7.1*	15.3	70.6	68.2	2.4	5.2	77.4	70.2	7.2	15.4
AFDC/TANF Receipt												
Ever Received AFDC/TANF***	40.1	39.5	0.6	1.2	48.7	44.9	3.8	7.5	53.8	49.1	4.7	9.4
Received AFDC/TANF in:												
1st Quarter***	29.9	27.3	2.6	5.5	33.9	28.8	5.2*	11.1	38.8	36.9	1.9	3.9
2nd Quarter***	30.7	27.6	3.1	6.6	33.5	30.0	3.6	7.5	40.3	41.2	-0.9	-1.9
3rd Quarter***	31.6	28.9	2.7	5.7	35.0	33.7	1.3	2.7	45.5	42.2	3.3	6.9
4th Quarter***	24.4	24.1	0.3	0.5	29.3	28.4	0.9	1.9	40.1	37.2	2.9	6.3
5th Quarter***	21.7	25.4	-3.8	-8.2	30.6	26.5	4.1	9.0	38.8	35.9	2.9	6.4
6th Quarter***	20.2	25.8	-5.6*	-12.2	30.6	27.0	3.6	7.8	38.5	38.8	-0.3	-0.6
7th Quarter***	17.8	20.2	-2.4	-5.4	25.3	23.0	2.4	5.4	26.4	34.8	-8.4*	-19.2
8th Quarter***	16.0	19.5	-3.4	-8.1	24.9	21.5	3.4	7.9	26.5	29.7	-3.2	-7.5
Total AFDC/TANF Benefits ($)	$1,992	$2,152	-$160	-4.1	$2,116	$1,958	$158	4.1	$2,391	$2,416	-$25	-0.7
Receipt of Other Welfare Benefits												
Ever Received Welfare***	66.4	64.3	2.1	4.5	70.0	67.6	2.3	5.0	68.8	65.7	3.2	6.7
Total Welfare Benefits ($)	$5,208	$5,486	-$278	-3.7	$5,310	$5,628	-$318	-4.2	$5,376	$5,652	-$276	-3.7
Ever Received Food Stamps***	58.1	58.5	-0.4	-0.7	62.7	60.3	-2.4	4.9	62.3	58.8	3.5	7.2
Total Food Stamp Benefits ($)	$2,065	$2,154	-$90	-3.3	$1,987	$1,868	$120	4.4	$2,377	$2,303	$74	2.7
Income/Poverty												
Income Above Poverty Level***	41.9	44.9	-3.0	-6.1	36.2	43.1	-6.8*	-13.9	52.3	40.3	11.9**	24.2
Subsequent Births												
Subsequent Birth by 24 Months after Random Assignment***	22.0	28.3	-6.4	-14.2	26.5	27.1	-0.6	-1.4	19.6	26.7	-7.1	-15.7
Sample Size	**266**	**367**	**733**		**410**	**374**	**784**		**300**	**270**	**570**	

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

TABLE E.VI.4 (*continued*)

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.5

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY IMPLEMENTATION STATUS OF MIXED APPROACH PROGRAMS

	Early Implementation					Late or Incomplete Implementation			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development									
Bayley Mental Development Index (MDI) Standard Score*[d]	93.1	89.5	3.7*	28.3		85.4	86.4	-1.0	-7.7
Percentage with MDI < 85***	27.2	36.4	-9.2	-19.7		45.3	43.6	1.7	3.6
Peabody Picture Vocabulary Test (PPVT)-III Standard Score	85.8	83.4	2.4	14.9		78.3	73.4	4.9	29.8
Percentage with PPVT-III < 85***	45.7	62.6	-16.9**	-33.9		66.2	70.2	-4.0	-8.1
Child Social-Emotional Development									
Engagement of Parent During Parent-Child Semistructured Play	4.9	4.5	0.5***	43.4		4.6	4.4	0.2	19.9
Sustained Attention with Objects During Parent-Child Semistructured Play	5.1	4.7	0.4***	41.7		4.8	4.7	0.2	16.8
Engagement of Parent During Parent-Child Puzzle Challenge Task	5.0	4.9	0.0	3.4		5.0	4.9	0.1	11.5
Persistence During Parent-Child Puzzle Challenge Task	4.6	4.5	0.1	11.6		4.4	4.4	-0.0	-2.0
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	4.0	4.1	-0.1	-15.2		4.0	4.1	-0.1	-15.2
Bayley BRS: Orientation/ Engagement	3.9	4.0	-0.2	-19.7		3.8	4.0	-0.1	-15.7
Negativity Toward Parent During Parent-Child Semistructured Play	1.2	1.4	-0.1	-21.1		1.3	1.3	0.0	2.2
Frustration During Parent-Child Puzzle Challenge Task	2.9	2.9	-0.0	-1.4		2.8	2.5	0.2	17.6
Child Behavior Checklist—Aggressive Behavior	11.0	12.0	-1.0	-14.8		10.3	10.3	-0.1	-0.8
Child Health Status									
Child's Health Status	4.1	4.2	-0.1	-14.2		4.2	4.0	0.2	17.1
Percentage of Children in Fair or Poor Health***	6.3	4.8	1.5	5.4		4.5	7.4	-2.9	-10.2
Quality of the Home Environment and Parenting: Overall and Physical Environment									
Home Observation for Measurement of the Environment (HOME) Total Score	27.8	27.1	0.6	12.8		26.3	26.0	0.3	5.8
HOME Internal Physical Environment	7.7	7.7	0.0	0.7		7.8	7.9	-0.1	-5.6
Parenting Behavior: Emotional Support									
HOME Warmth	2.5	2.3	0.1	13.8		2.4	2.4	0.0	0.7
Supportiveness During Parent-Child Semistructured Play	4.1	3.8	0.3	27.1		3.8	3.6	0.2	18.4
Supportive Presence During Parent-Child Puzzle Challenge Task**	4.8	4.3	0.6***	42.2		4.0	4.0	-0.1	-3.6
Parenting Behavior: Stimulation of Language and Learning									
Percentage of Children with a Regular Bedtime***	58.5	66.1	-7.6	-15.4		59.9	62.0	-2.1	-4.2
Percentage of Children Who Follow a Bedtime Routine***	66.5	62.6	3.9	8.5		69.8	73.2	-3.3	-7.2

TABLE E.VI.5 (*continued*)

	Early Implementation					Late or Incomplete Implementation			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
HOME: Support of Language and Learning	10.5	10.3	0.2	8.8		10.1	9.8	0.3	13.9
Parent-Child Play	4.3	4.1	0.2*	24.3		4.5	4.3	0.1	14.8
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.9	3.6	0.3*	27.8		3.3	3.0	0.3*	25.1
Percentage of Parents Who Read to Child Daily***	60.4	37.3	23.1***	46.2		58.0	50.4	7.6	15.2
Percentage of Parents Who Read to Child at Bedtime***	39.0	27.4	11.6	25.5		35.2	32.0	3.2	7.1
Parenting Behavior: Negative Parenting Behavior									
Detachment During Parent-Child Semistructured Play	1.3	1.4	-0.1	-22.1		1.1	1.4	-0.2**	-35.7
Intrusiveness During Parent-Child Semistructured Play	1.5	1.6	-0.1	-7.8		1.8	1.7	0.1	7.0
Detachment During Parent-Child Puzzle Challenge Task	1.6	2.0	-0.4**	-37.2		1.8	2.0	-0.2	-18.8
Intrusiveness During Parent-Child Puzzle Challenge Task*	2.6	2.9	-0.4*	-27.4		2.9	2.8	0.2	13.5
Negative Regard During Parent-Child Semistructured Play	1.4	1.3	0.0	5.6		1.3	1.3	0.1	10.4
HOME Harshness	0.2	0.2	-0.0	-3.2		0.3	0.2	0.1	13.7
Percentage of Parents Who Spanked Child in the Past Week***	42.3	55.5	-13.2*	-26.5		50.7	61.8	-11.1*	-22.2
Knowledge of Safety Practices and Discipline Strategies									
Percentage of Parents Who Usually Use a Car Seat Correctly***	73.8	68.9	4.9	10.8		73.4	77.0	-3.6	-7.9
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	33.0	51.9	-18.9***	-37.8		54.9	58.3	-3.4	-6.8
Percentage of Parents Who Would Use Mild Discipline Only***	60.0	38.9	21.1***	42.8		38.5	35.0	3.5	7.2
Index of Severity of Discipline Strategies**	2.8	3.5	-0.7***	-43.8		3.6	3.7	-0.1	-7.8
Parent Physical and Mental Health									
Parent's Health Status	3.3	3.4	-0.1	-12.9		3.7	3.6	0.1	8.7
Parenting Stress Index (PSI) Parental Distress	24.2	25.3	-1.1	-11.6		25.4	25.7	-0.4	-3.8
PSI Parent-Child Dysfunctional Interaction	17.6	17.9	-0.4	-5.4		18.6	17.0	1.6*	25.2
Center for Epidemiological Studies Depression (CES-D; Short Form)*	7.2	8.5	-1.3	-18.1		7.1	6.1	1.0	14.3
CES-D Severe Depressive Symptoms ***	15.3	14.9	0.4	1.1		13.0	10.6	2.3	6.5
Family Environment Scale (FES): Family Conflict	1.7	1.8	-0.0	-6.7		1.6	1.6	-0.0	-2.4
Father Presence									
Currently Married to Biological Father ***	35.7	35.2	0.4	0.9		33.3	34.8	-1.6	-3.2
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	48.3	50.9	-2.6	-5.2		43.5	42.0	1.6	3.1
Biological Father Currently Present in Child's Life***	70.9	67.9	3.1	6.9		69.9	67.8	2.1	4.6

TABLE E.VI.5 (*continued*)

	Early Implementation					Late or Incomplete Implementation			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Continuous Biological Father Presence Child Age 14-36 Months***	63.2	68.5	-5.3	-11.5		65.5	60.0	5.5	11.9
No Biological Father Presence Child Age 14-36 Months***	16.8	13.3	3.4	11.0		14.3	16.7	-2.4	-7.6
Continuous Male Presence Child Age 14-36 Months***	74.9	79.2	-4.4	-12.2		84.0	77.8	6.3	17.5
No Male Presence Child Age 14-36 Months*	2.9	1.7	1.2	10.1		3.0	1.9	1.2	9.5
Sample Size									
Bayley	**136**	**153**	**289**			**130**	**104**	**234**	
Parent Interview	**173**	**182**	**355**			**178**	**162**	**340**	
Parent-Child Interactions	**122**	**139**	**261**			**129**	**116**	**245**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.6

IMPACTS ON SELF-SUFFICIENCY AT 28 MONTHS, BY IMPLEMENTATION STATUS OF MIXED APPROACH PROGRAMS

	Early Implementers					Late or Incomplete Implementers			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Education/Job Training									
Ever in Education or Training***[d]	60.7	44.1	16.6**	33.2		70.1	57.6	12.5**	25.0
Ever in High School***	7.2	6.8	0.4	1.4		23.9	14.1	9.7**	34.1
Ever in ESL Class***	3.0	2.8	0.2	1.4		7.1	4.2	2.9	20.3
Ever in Vocational Program***	22.2	15.4	6.8	18.0		22.8	19.4	3.3	8.9
Average Hours per Week in Education or Training	2.6	2.6	0.0	0.6		5.9	4.2	1.8**	27.5
In Education or Training:									
1st Quarter***	17.7	12.3	5.3	12.9		27.2	26.7	0.4	1.1
2nd Quarter***	17.2	14.3	2.9	6.6		37.3	29.2	8.1	18.7
3rd Quarter***	21.9	19.7	2.2	5.1		40.8	31.1	9.7*	22.0
4th Quarter***	24.7	21.9	2.8	6.5		38.3	30.0	8.2	19.2
5th Quarter***	22.6	23.2	-0.6	-1.3		36.8	33.3	3.5	8.1
6th Quarter***	25.8	22.1	3.7	8.8		29.0	27.3	1.7	4.1
7th Quarter***	21.9	21.2	0.7	1.8		31.3	24.5	6.8	17.0
8th Quarter***	22.4	14.3	8.1	20.7		33.0	24.5	8.5	21.7
Have High School Diploma***	52.1	50.8	1.3	2.7		48.5	45.0	3.5	7.0
Have GED***	14.7	7.4	7.3	23.1		5.7	9.1	-3.4	-10.7
Employment									
Ever Employed***	88.5	78.2	10.3**	27.5		88.4	82.8	5.6	14.9
Average Hours/Week Employed	15.7	12.9	2.8	18.9		17.8	18.8	-1.0	-6.4
Employed in:									
1st Quarter***	31.7	32.1	-0.3	-0.7		38.8	34.2	4.7	9.6
2nd Quarter***	43.1	35.5	7.6	15.3		47.5	44.8	2.7	5.5
3rd Quarter***	52.5	46.2	6.2	12.4		53.1	56.0	-2.9	-5.8
4th Quarter***	58.6	47.4	11.2*	22.4		54.2	58.2	-4.0	-8.1
5th Quarter***	61.2	46.7	14.6**	29.6		59.4	61.0	-1.7	-3.4
6th Quarter***	60.2	49.5	10.7	21.7		64.4	61.2	3.4	6.8
7th Quarter***	55.5	48.5	7.0	14.1		66.9	57.0	9.9	20.0
8th Quarter***	63.9	50.2	13.8**	28.2		70.3	62.1	8.3	16.9
Any Self-Sufficiency-Oriented Activity (Education, Training, or Employment)									
Ever Employed or in Education/Training***	93.4	86.4	7.0*	23.1		97.7	91.4	6.3**	20.8
Average Hours per Week in Any Activity	18.7	16.1	2.6	16.6		23.9	23.0	0.9	5.9
In Activities in:									
1st Quarter***	44.1	40.7	3.4	6.8		57.6	52.8	4.8	9.7
2nd Quarter***	53.4	43.6	9.9*	20.0		70.2	60.9	9.4*	19.0
3rd Quarter***	63.3	59.1	4.2	8.8		78.0	68.3	9.7*	20.4
4th Quarter***	70.5	59.0	11.5**	24.2		73.1	72.0	1.2	2.4
5th Quarter***	69.5	60.8	8.7	18.9		78.1	72.8	5.3	11.5
6th Quarter***	70.3	61.8	8.5	18.1		78.1	70.1	8.0	17.0
7th Quarter***	64.8	59.6	5.2	10.9		78.5	66.7	11.8**	24.6
8th Quarter***	72.2	57.6	14.6**	31.3		82.1	69.6	12.4**	26.6

TABLE E.VI.6 (*continued*)

	Early Implementers					Late or Incomplete Implementers			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
AFDC/TANF Receipt									
Ever Received AFDC/TANF***	54.9	60.3	-5.4	-10.8		38.9	29.8	9.0**	18.2
Received AFDC/TANF in:									
1st Quarter***	42.7	39.7	3.0	6.3		23.3	19.6	3.7	8.0
2nd Quarter***	44.1	42.5	1.6	3.4		25.3	21.3	4.0	8.4
3rd Quarter***	47.4	43.1	4.3	9.0		26.5	23.9	2.6	5.4
4th Quarter***	40.4	38.6	1.8	3.9		20.9	13.9	6.9*	15.0
5th Quarter***	36.2	42.0	-5.8	-12.6		24.4	11.0	13.4***	29.2
6th Quarter***	34.6	41.3	-6.7	-14.5		18.5	12.2	6.3	13.6
7th Quarter***	29.9	33.1	-3.2	-7.2		15.5	12.3	3.3	7.4
8th Quarter***	25.7	33.4	-7.7	-18.0		13.7	14.1	-0.4	-0.9
Total AFDC/TANF Benefits ($)	$3,590	$3,592	-$2	-0.1		$1,046	$688	$358*	9.3
Receipt of Other Welfare Benefits									
Ever Received Welfare***	72.3	76.3	-3.9	-8.4		59.7	53.5	6.2	13.3
Total Welfare Benefits ($)	$7,084	$8,275	-$1,191	-15.7		$3,762	$3,834	-$77	-1.0
Ever Received Food Stamps***	64.0	71.5	-7.5	-15.3		52.6	43.6	9.0**	18.4
Total Food Stamp Benefits ($)	$2,560	$2,653	-$92	-3.4		$1,772	$1,558	$214	7.9
Income/Poverty									
Income Above Poverty Level***	36.3	34.4	1.9	3.9		47.1	50.0	-2.9	-6.0
Subsequent Births									
Subsequent Birth by 24 Months after Random Assignment***	20.0	27.9	-8.0	-17.7		28.6	28.4	0.2	0.4
Sample Size	**180**	**195**	**375**			**178**	**159**	**367**	

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.7

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY IMPLEMENTATION STATUS FOR HOME-BASED PROGRAMS

	Early or Late Implementers					Incomplete Implementers			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development									
Bayley Mental Development Index (MDI) Standard Score*[d]	92.9	90.2	2.7**	21.0		95.5	96.2	-0.7	-5.3
Percentage with MDI < 85***	24.9	27.3	-2.4	-5.2		14.8	14.7	0.1	0.1
Peabody Picture Vocabulary Test (PPVT)-III Standard Score*	81.4	77.2	4.2*	25.6		87.6	88.8	-1.1	-6.8
Percentage with PPVT-III < 85***	55.9	60.1	-4.2	-8.3		35.6	38.3	-2.6	-5.3
Child Social-Emotional Development									
Engagement of Parent During Parent-Child Semistructured Play	4.7	4.7	0.1	9.4		5.0	4.6	0.4**	33.6
Sustained Attention with Objects During Parent-Child Semistructured Play	4.9	4.8	0.0	3.5		5.1	4.9	0.2*	23.6
Engagement of Parent During Parent-Child Puzzle Challenge Task	5.1	5.1	0.0	0.3		5.1	5.0	0.1	12.0
Persistence During Parent-Child Puzzle Challenge Task	4.7	4.6	0.0	2.4		4.8	4.5	0.3	22.3
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	4.0	3.9	0.1	12.3		3.9	4.0	-0.1	-15.1
Bayley BRS: Orientation/ Engagement	3.8	3.7	0.1	10.0		3.9	3.9	-0.1	-6.9
Negativity Toward Parent During Parent-Child Semistructured Play	1.3	1.3	-0.0	-0.8		1.3	1.4	-0.1	-11.6
Frustration During Parent-Child Puzzle Challenge Task	2.7	2.6	0.1	7.9		2.7	2.8	-0.0	-1.2
Child Behavior Checklist—Aggressive Behavior	11.6	12.0	-0.4	-6.8		10.7	11.6	-0.9	-13.7
Child Health Status									
Child's Health Status	3.9	3.9	0.0	0.5		4.1	4.1	-0.1	-4.9
Percentage of Children in Fair or Poor Health***	12.7	12.4	0.2	0.8		6.1	6.7	-0.5	-1.9
Quality of the Home Environment and Parenting: Overall and Physical Environment									
Home Observation for Measurement of the Environment (HOME) Total Score	28.1	27.9	0.2	4.4		28.4	28.3	0.2	3.7
HOME Internal Physical Environment	7.9	8.0	-0.1	-4.8		8.1	8.0	0.1	4.8
Parenting Behavior: Emotional Support									
HOME Warmth	2.7	2.7	0.0	4.2		2.7	2.8	-0.1	-5.6
Supportiveness During Parent-Child Semistructured Play	4.0	3.9	0.1	6.7		4.1	3.9	0.2	21.6
Supportive Presence During Parent-Child Puzzle Challenge Task	4.6	4.6	0.0	1.5		4.5	4.4	0.1	6.3
Parenting Behavior: Stimulation of Language and Learning									
Percentage of Children with a Regular Bedtime***	58.2	55.3	2.8	5.8		61.7	53.9	7.8	15.9
Percentage of Children Who Follow a Bedtime Routine***	70.5	70.0	0.6	1.2		74.9	68.3	6.6	14.2

TABLE E.VI.7 (*continued*)

	Early or Late Implementers					Incomplete Implementers			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
HOME: Support of Language and Learning	10.7	10.5	0.3	11.9		11.1	11.0	0.1	4.5
Parent-Child Play	4.3	4.3	-0.0	-3.4		4.5	4.5	0.1	-7.2
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.7	3.5	0.2	12.8		3.4	3.6	-0.2	-16.3
Percentage of Parents Who Read to Child Daily***	51.8	53.1	-1.4	-2.8		57.9	59.6	-1.7	-3.3
Percentage of Parents Who Read to Child at Bedtime***	28.9	25.4	3.5	7.7		30.8	27.0	3.7	8.2
Parenting Behavior: Negative Parenting Behavior									
Detachment During Parent-Child Semistructured Play	1.2	1.2	0.0	1.1		1.2	1.3	-0.1	-9.3
Intrusiveness During Parent-Child Semistructured Play	1.6	1.5	0.0	4.5		1.6	1.7	-0.1	-11.3
Detachment During Parent-Child Puzzle Challenge Task	1.5	1.5	0.0	1.1		1.7	1.7	0.0	0.3
Intrusiveness During Parent-Child Puzzle Challenge Task	2.6	2.7	-0.1	-8.2		2.4	2.4	-0.0	-1.6
Negative Regard During Parent-Child Semistructured Play	1.2	1.2	-0.1	-10.3		1.3	1.3	-0.0	-5.4
HOME Harshness	0.3	0.2	0.1	10.8		0.4	0.4	-0.0	-7.0
Percentage of Parents Who Spanked Child in the Past Week***	36.2	45.9	-9.7**	-19.5		54.9	61.8	-1.9	-3.9
Knowledge of Safety Practices and Discipline Strategies									
Percentage of Parents Who Usually Use a Car Seat Correctly***	75.2	75.1	0.1	0.2		64.1	61.8	2.3	5.1
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	32.1	33.4	-1.3	-2.6		62.6	60.4	2.2	4.3
Percentage of Parents Who Would Use Mild Discipline Only***	55.8	53.7	2.1	4.2		31.4	34.8	-3.4	-6.9
Index of Severity of Discipline Strategies	2.9	3.0	-0.1	-6.3		3.9	3.8	0.1	3.5
Parent Physical and Mental Health									
Parent's Health Status	3.3	3.3	0.0	3.3		3.4	3.6	-0.2	-14.8
Parenting Stress Index (PSI) Parental Distress	25.8	27.7	-1.9**	-20.2		23.6	25.1	-1.5	-15.7
PSI Parent-Child Dysfunctional Interaction	17.7	18.1	-0.4	-6.7		17.2	18.0	-0.8	-12.9
Center for Epidemiological Studies Depression (CES-D; Short Form)	7.7	8.2	-0.5	-7.3		7.8	7.4	0.4	5.0
CES-D Severe Depressive Symptoms ***	15.0	17.5	-2.5	-7.0		13.6	14.6	-1.0	-2.8
Family Environment Scale (FES): Family Conflict	1.8	1.7	0.1	8.6		1.6	1.7	-0.1	-17.0
Father Presence									
Currently Married to Biological Father ***	52.9	53.2	-0.4	-0.7		19.0	20.8	-1.9	-3.8
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	63.5	69.4	-5.9	-11.8		38.8	39.3	-0.6	-1.1
Biological Father Currently Present in Child's Life***	77.2	80.0	-2.9	-6.4		67.3	70.6	-3.3	-7.5

TABLE E.VI.7 (*continued*)

	Early or Late Implementers					Incomplete Implementers			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Continuous Biological Father Involvement Child Age 14-36 Months***	74.3	82.1	-7.8*	-17.0		58.2	65.3	-7.1	-15.4
No Biological Father Involvement Child Age 14-36 Months***	9.1	8.9	0.2	0.7		15.9	9.4	6.5	20.8
Continuous Male Involvement Child Age 14-36 Months***	81.4	91.3	-9.9***	-27.7		75.1	81.7	-6.7	-18.6
No Male Involvement Child Age 14-36 Months***	1.7	0.4	1.3	10.6		3.4	2.4	0.9	7.7
Sample Size									
Bayley	**303**	**259**	**562**			**199**	**189**	**388**	
Parent Interview	**261**	**225**	**486**			**135**	**123**	**258**	
Parent-Child Interactions	**246**	**213**	**459**			**150**	**137**	**287**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessment of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.8

IMPACTS ON SELF-SUFFICIENCY AT 28 MONTHS, BY IMPLEMENTATION STATUS FOR HOME-BASED PROGRAMS

	Early or Late Implementers					Incomplete Implementers			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Education/Job Training									
Ever in Education or Training***[d]	46.5	46.3	0.2	0.4		63.2	41.6	21.6***	43.2
Ever in High School***	11.1	6.9	4.1*	14.5		14.5	5.3	9.2***	32.3
Ever in ESL Class***	5.7	4.2	1.5	10.6		0.4	-0.1	0.5	3.5
Ever in Vocational Program***	13.1	16.4	-3.3	-8.8		25.8	13.6	12.2**	32.3
Average Hours per Week in Education or Training	3.0	2.6	0.5	7.6		6.6	3.0	3.7***	57.8
In Education or Training:									
1st Quarter***	18.4	19.3	-0.9	-2.2		25.2	22.0	3.2	7.7
2nd Quarter***	21.7	19.0	2.7	6.3		29.9	25.5	4.4	10.3
3rd Quarter***	21.8	23.5	-1.8	-4.0		37.5	28.0	9.5**	21.6
4th Quarter***	23.4	19.9	3.5	8.1		32.7	23.4	9.3**	21.7
5th Quarter***	23.9	21.7	2.1	5.0		35.6	22.7	12.9***	30.0
6th Quarter***	21.5	22.7	-1.2	-2.8		38.6	18.7	19.9***	47.9
7th Quarter***	19.2	19.3	-0.1	-0.3		28.6	13.6	15.0***	37.3
8th Quarter***	20.9	15.9	4.9	12.5		29.4	15.7	13.7***	34.8
Have High School Diploma***	39.1	40.2	-1.2	-2.3		62.4	53.3	9.1*	18.2
Have GED***	7.9	6.1	1.9	5.9		9.6	19.2	-9.6**	-30.2
Employment									
Ever Employed***	79.0	80.3	-1.3	-3.6		89.5	83.1	6.4	17.0
Average Hours/Week Employed	13.9	14.3	-0.4	-2.6		16.2	15.9	0.4	2.6
Employed in:									
1st Quarter***	34.1	33.6	0.5	1.0		33.6	38.2	-4.6	-9.5
2nd Quarter***	37.1	41.3	-4.1	-8.3		39.4	43.6	-4.2	-8.3
3rd Quarter***	43.7	48.1	-4.4	-8.8		51.1	52.3	-1.2	-2.5
4th Quarter***	48.7	48.9	-0.2	-0.3		56.4	53.5	2.9	5.7
5th Quarter***	55.6	56.7	-1.1	-2.2		61.1	59.8	1.3	2.7
6th Quarter***	57.7	54.1	3.5	7.2		67.6	63.0	4.6	9.3
7th Quarter***	57.1	56.7	0.4	0.9		58.6	52.6	6.1	12.3
8th Quarter***	55.1	58.3	-3.2	-6.5		57.6	62.0	-4.4	-8.9
Any Self-Sufficiency-Oriented Activity (Education, Training, or Employment)									
Ever Employed or in Education/Training***	87.1	87.6	-0.5	-1.6		96.4	88.4	7.9***	26.2
Average Hours per Week in Any Activity	17.5	17.0	0.4	2.8		23.5	19.6	3.9**	24.5
In Activities in:									
1st Quarter***	44.4	44.9	-0.6	-1.1		51.3	50.5	0.8	1.6
2nd Quarter***	48.5	51.9	-3.4	-6.8		60.1	57.3	2.8	5.7
3rd Quarter***	53.9	59.0	-5.0	-10.6		74.0	65.6	8.3*	17.6
4th Quarter***	60.0	57.6	2.4	5.1		72.7	63.0	9.6**	20.2
5th Quarter***	65.2	65.2	-0.0	-0.1		76.1	69.3	6.8	14.6
6th Quarter***	65.9	63.4	2.5	5.2		82.8	68.8	13.9***	29.7
7th Quarter***	64.0	53.6	0.4	0.9		70.4	60.8	9.6*	20.1
8th Quarter***	62.6	64.1	-1.6	-3.3		69.7	68.9	0.8	1.8

TABLE E.VI.8 (*continued*)

	Early or Late Implementers					Incomplete Implementers			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
AFDC/TANF Receipt									
Ever Received AFDC/TANF***	44.8	42.1	2.7	5.4		69.7	65.7	4.0	8.0
Received AFDC/TANF in:									
1st Quarter***	34.6	31.0	3.6	7.8		52.8	49.7	3.1	6.5
2nd Quarter***	33.6	32.0	1.6	3.4		53.4	55.5	-2.1	-4.4
3rd Quarter***	35.4	34.3	1.2	2.4		61.1	55.5	5.6	11.7
4th Quarter***	28.8	30.1	-1.1	-2.7		48.9	48.6	0.2	0.5
5th Quarter***	28.0	29.1	-1.1	-2.4		47.0	49.1	-2.2	-4.7
6th Quarter***	29.6	28.0	1.6	3.4		46.4	51.6	-5.2	-11.3
7th Quarter***	23.7	21.2	2.4	5.6		33.3	44.0	-10.7**	-24.3
8th Quarter***	24.0	18.3	5.7*	13.5		33.7	38.5	-4.9	-11.5
Total AFDC/TANF Benefits ($)	$2,394	$2,535	-$141	-3.7		$3,108	$3,172	-$64	-1.7
Receipt of Other Welfare Benefits									
Ever Received Welfare***	63.9	62.7	1.2	2.6		85.2	79.6	5.6*	11.9
Total Welfare Benefits ($)	$5,186	$5,559	-$373	-4.9		$6,886	$6,785	$101	1.3
Ever Received Food Stamps***	57.8	58.5	-0.7	-1.5		78.4	74.8	3.7	7.5
Total Food Stamp Benefits ($)	$1,753	$1,660	$93	3.4		$3,024	$2,758	$265	9.7
Income/Poverty									
Income Above Poverty Level***	42.8	44.9	-2.2	-4.4		38.8	37.9	0.9	1.8
Subsequent Births									
Subsequent Birth by 24 Months after Random Assignment***	26.5	26.2	0.3	0.6		25.9	31.3	-5.4	-12.0
Sample Size	**287**	**276**	**563**			**201**	**177**	**378**	

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.9

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY IMPLEMENTATION STATUS OF ALL SERVICES

	Strong Full Implementation					Not Strong or Not Full Implementation			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Particiapants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development									
Bayley Mental Development Index (MDI) Standard Score**[d]	93.7	89.8	4.0***	30.6		90.7	90.1	0.7	5.2
Percentage with MDI < 85***	25.2	33.0	-7.8	-16.8		27.9	31.5	-3.6	-7.7
PPVT-III Standard Score	84.5	83.6	0.9	5.5		82.8	80.6	2.2**	13.6
Percentage with PPVT-III < 85***	47.4	55.7	-8.3	-16.6		52.3	57.2	-4.9	-9.8
Child Social-Emotional Development									
Engagement of Parent During Parent-Child Semistructured Play	4.9	4.6	0.3**	26.3		4.8	4.6	0.2***	22.7
Sustained Attention with Objects During Parent-Child Semistructured Play	5.1	4.9	0.3**	25.0		4.9	4.8	0.1**	14.2
Engagement of Parent During Parent-Child Puzzle Challenge Task	5.1	4.9	0.2	19.8		5.0	4.9	0.1	5.2
Persistence During Parent-Child Puzzle Challenge Task	4.6	4.6	0.1	4.3		4.5	4.4	0.1	8.4
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	4.1	4.1	-0.0	-2.8		4.0	4.0	0.0	0.3
Bayley BRS: Orientation/ Engagement	4.0	4.1	-0.0	-2.3		3.8	3.8	0.1	6.5
Negativity Toward Parent During Parent-Child Semistructured Play	1.2	1.3	-0.1	-14.2		1.3	1.3	-0.1*	-12.2
Frustration During Parent-Child Puzzle Challenge Task	2.8	2.9	-0.1	-4.0		2.7	2.6	0.1	4.0
Child Behavior Checklist—Aggressive Behavior	11.6	12.8	-1.2	-18.3		10.3	11.1	-0.7**	-11.5
Child Health Status									
Child's Health Status	4.0	4.1	-0.1	-9.0		4.0	4.0	0.0	1.2
Percentage of Children in Fair or Poor Health***	6.8	8.1	-1.3	-4.5		8.5	9.0	-0.4	-1.5
Quality of the Home Environment and Parenting: Overall and Physical Environment									
Home Observation for Measurement of the Environment (HOME) Total Score*	28.4	27.2	1.3**	26.2		27.3	27.0	0.3	5.8
HOME Internal Physical Environment	7.9	7.8	0.1	6.7		7.8	7.8	-0.0	-2.5
Parenting Behavior: Emotional Support									
HOME Warmth	2.5	2.4	0.2	17.8		2.6	2.5	0.1	6.0
Supportiveness During Parent-Child Semistructured Play	4.1	4.0	0.1	12.4		4.0	3.8	0.2***	17.1
Supportive Presence During Parent-Child Puzzle Challenge Task	4.9	4.7	0.2	14.0		4.3	4.3	0.0	1.3
Parenting Behavior: Stimulation of Language and Learning									
Percentage of Children with a Regular Bedtime***	64.5	64.0	0.5	1.0		58.0	56.6	1.4	2.9
Percentage of Children Who Follow a Bedtime Routine***	74.3	71.0	3.3	7.1		67.8	68.5	-0.7	-1.5
HOME: Support of Language and Learning	10.8	10.5	0.3	12.5		10.6	10.4	0.2	7.1

TABLE E.VI.9 (*continued*)

	Strong Full Implementation					Not Strong or Not Full Implementation			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Particiapants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Parent-Child Play	4.5	4.2	0.3***	34.5		4.4	4.4	0.0	5.3
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.9	3.9	0.0	3.1		3.5	3.4	0.1	9.4
Percentage of Parents Who Read to Child Daily***	64.3	48.2	16.1***	32.3		54.7	51.1	3.6	7.1
Percentage of Parents Who Read to Child at Bedtime***	43.4	33.7	9.7*	21.4		29.0	27.5	1.5	3.3
Parenting Behavior: Negative Parenting Behavior									
Detachment During Parent-Child Semistructured Play	1.2	1.3	-0.0	-5.5		1.2	1.3	-0.1*	-11.7
Intrusiveness During Parent-Child Semistructured Play*	1.4	1.6	-0.2**	-23.5		1.7	1.7	-0.0	-1.1
Detachment During Parent-Child Puzzle Challenge Task	1.5	1.6	-0.0	-4.6		1.7	1.7	0.0	1.0
Intrusiveness During Parent-Child Puzzle Challenge Task	2.4	2.6	-0.2	-14.0		2.7	2.8	-0.1	-5.0
Negative Regard During Parent-Child Semistructured Play	1.2	1.3	-0.1	-9.4		1.3	1.3	0.0	1.3
HOME Harshness	0.1	0.1	-0.0	-6.2		0.3	0.3	0.0	5.5
Percentage of Parents Who Spanked Child in the Past Week***	45.9	55.4	-9.5*	-19.1		47.0	54.6	-7.6***	-15.2
Knowledge o Safety Practices and Discipline Strategies									
Percentage of Parents Who Usually Use a Car Seat Correctly***	74.1	73.9	0.2	0.5		68.6	71.8	-3.2	-7.1
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	34.8	51.1	-16.4***	-32.7		49.8	53.3	-3.8	-7.6
Percentage of Parents Who Would Use Mild Discipline Only***	56.8	41.9	14.9***	30.3		41.0	37.7	3.2	6.6
Index of Severity of Discipline Strategies***	3.0	3.6	-0.6***	-36.1		3.5	3.6	-0.1*	-8.9
Parent Physical and Mental Health									
Parent's Health Status	3.4	3.5	-0.1	-9.7		3.5	3.5	-0.0	-1.3
Parenting Stress Index (PSI) Parental Distress	24.4	25.4	-1.0	-10.4		24.8	25.4	-0.6	-6.5
PSI Parent-Child Dysfunctional Interaction	18.4	18.1	0.3	4.7		17.6	17.8	-0.2	-3.1
Center for Epidemiological Studies Depression (CES-D; Short Form)	7.9	8.6	-0.7	-9.9		7.2	7.4	-0.2	-2.7
CES-D Severe Depressive Symptoms ***	17.0	16.9	0.1	0.2		13.7	14.1	-0.4	-1.0
Family Environment Scale (FES): Family Conflict	1.7	1.7	-0.1	-16.2		1.7	1.7	0.0	0.0
Father Presence									
Currently Married to Biological Father ***	46.5	47.4	-0.9	-1.9		31.0	33.1	-2.1	-4.3
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	54.7	58.8	-4.0	-8.1		47.1	48.9	-1.8	-3.6
Biological Father Currently Present in Child's Life***	73.9	72.0	1.9	4.2		73.3	71.5	0.8	1.7

TABLE E.VI.9 (*continued*)

	Strong Full Implementation					Not Strong or Not Full Implementation			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Particiapants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Continuous Biological Father Presence Age 14-36 Months***	68.1	70.5	-2.4	-5.2		67.0	67.9	-0.9	-2.0
No Biological Father Presence Age 14-36 Months***	14.5	10.2	4.2	13.5		11.6	12.5	-0.9	-2.9
Continuous Male Presence Age 14-36 Months***	80.3	80.2	0.0	0.1		79.5	83.7	-4.3*	-11.9
No Male Presence Age 14-36 Months***	2.3	1.5	0.8	6.7		2.2	1.8	0.4	3.3
Sample Size									
Bayley	**203**	**202**	**405**			**676**	**577**	**1,253**	
Parent Interview	**253**	**240**	**493**			**854**	**763**	**1,617**	
Parent-Child Interactions	**201**	**193**	**394**			**673**	**591**	**1,264**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.10

IMPACTS ON SELF-SUFFICIENCY AT 28 MONTHS, BY IMPLEMENTATION STATUS OF ALL SERVICES

	Strong Full Implementation					Not Strong or Not Full Implementation			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Education/Job Training									
Ever in Education or Training***[d]	52.5	48.5	4.0	8.0		62.3	52.7	9.6***	19.2
Ever in High School***	7.0	4.8	2.2	7.7		15.7	10.4	5.3***	18.5
Ever in ESL Class***	1.7	2.6	-0.9	-6.1		4.1	2.8	1.2	8.5
Ever in Vocational Program***	17.8	14.1	3.7	9.9		20.7	17.6	3.1	8.2
Average Hours per Week in Education or Training	2.5	2.6	-0.1	-1.9		5.3	3.7	1.5***	24.3
In Education or Training:									
1st Quarter***	20.2	16.8	3.4	8.3		23.0	23.9	-0.9	-2.2
2nd Quarter***	21.6	19.4	2.2	5.2		28.8	26.7	2.2	5.1
3rd Quarter***	21.7	21.9	-0.3	-0.6		34.4	28.5	5.9**	13.4
4th Quarter***	24.8	20.2	4.6	10.8		32.9	26.5	6.4***	14.9
5th Quarter***	22.2	21.8	0.4	1.0		33.2	26.5	6.7***	15.5
6th Quarter***	21.4	19.5	1.9	4.7		32.3	24.1	8.1***	19.6
7th Quarter***	17.9	16.5	1.4	3.5		28.8	22.4	6.4**	15.9
8th Quarter***	18.4	15.3	3.1	7.9		29.0	21.3	7.7***	19.6
Have High School Diploma ***	62.9	56.5	6.4	12.9		46.4	47.5	-1.1	-2.2
Have GED***	11.7	10.3	1.4	4.3		9.4	11.5	-2.1	-6.6
Employment									
Ever Employed***	89.1	82.3	6.8*	18.1		86.1	83.9	2.2	5.8
Average Hours/Week Employed	18.0	15.8	2.2	14.9		16.9	17.4	-0.6	-3.7
Employed in:									
1st Quarter***	44.6	42.2	2.5	5.1		37.3	37.9	-0.7	-1.4
2nd Quarter***	54.1	47.3	6.8	13.6		43.1	44.8	-1.8	-3.5
3rd Quarter***	63.6	53.2	10.4**	20.8		49.8	52.1	-2.3	-4.6
4th Quarter***	65.5	55.5	10.0**	21.1		54.1	54.4	-0.3	-0.5
5th Quarter***	68.7	58.3	10.4**	21.1		59.3	59.5	-0.2	-0.5
6th Quarter***	68.3	56.1	12.2**	24.7		62.8	60.0	2.8	5.6
7th Quarter***	59.7	54.9	4.7	9.5		60.4	57.6	2.8	5.7
8th Quarter***	65.0	58.2	6.9	14.0		62.9	62.2	0.7	1.3
Any Self-Sufficiency-Oriented Activity (Education, Training or Employment)									
Ever Employed or in Education/Training***	92.7	90.6	2.2	7.1		94.3	90.8	3.5**	11.5
Average Hours per Week in Any Activity	20.7	19.1	1.6	10.1		22.9	21.6	1.3	7.9
In Activities in:									
1st Quarter***	56.2	52.7	3.5	7.0		52.7	52.5	0.3	0.5
2nd Quarter***	63.4	57.5	6.0	12.1		62.1	58.8	3.3	6.7
3rd Quarter***	71.9	67.0	4.9	10.3		69.8	66.2	3.5	7.4
4th Quarter***	76.0	64.6	11.4***	23.8		71.2	66.5	4.7**	9.9
5th Quarter***	76.0	69.7	6.3	13.7		74.0	69.9	4.1*	8.9
6th Quarter***	74.4	66.3	8.1*	17.1		77.7	68.6	9.1***	19.4
7th Quarter***	67.4	63.9	3.6	7.5		73.1	66.1	7.0***	14.6
8th Quarter***	71.4	64.3	7.1	15.3		75.0	70.4	4.6*	9.9

TABLE E.VI.10 (*continued*)

	Strong Full Implementation					Not Strong or Not Full Implementation			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
AFDC/TANF Receipt									
Ever Received AFDC/TANF***	34.3	35.8	-1.5	-3.1		50.9	47.2	3.7*	7.5
Received AFDC/TANF in:									
1st Quarter***	25.2	23.9	1.3	2.9		36.5	33.1	3.4*	7.2
2nd Quarter***	25.7	24.8	0.9	1.9		37.1	35.4	1.6	3.4
3rd Quarter***	26.5	25.0	1.5	3.2		39.8	37.5	2.3	4.7
4th Quarter***	20.4	19.7	0.8	1.6		33.5	32.7	0.8	1.8
5th Quarter***	17.9	21.5	-3.6	-7.8		33.3	31.6	1.6	3.5
6th Quarter***	16.4	23.3	-6.9*	-14.8		32.7	32.9	-0.2	-0.4
7th Quarter***	15.6	18.7	-3.1	-6.9		24.8	28.9	-4.1*	-9.4
8th Quarter***	14.2	18.1	-3.9	-9.1		24.4	25.3	-0.9	-2.1
Total AFDC/TANF Benefits ($)*	$1,558	$1,688	-$130	-3.4		$2,325	$2,354	-$29	-0.8
Receipt of Other Welfare Benefits									
Ever Received Welfare***	63.8	60.5	3.2	6.9		69.7	67.4	2.3	4.9
Total Welfare Benefits ($)*	$4,443	$5,158	-$715	-9.4		$5,574	$5,837	-$263	-3.5
Ever Received Food Stamps***	56.1	56.2	-0.0	-0.1		62.2	59.8	2.4	5.0
Total Food Stamp Benefits ($)	$2,041	$2,287	-$246	-9.0		$2,142	$2,090	$51	1.9
Income/Poverty									
Income Above Poverty Level***	42.4	42.8	-0.4	-0.7		43.0	43.7	-0.7	-1.4
Subsequent Births									
Subsequent Birth by 24 Months after Random Assignment***	24.2	26.2	-2.0	-4.4		22.4	27.6	-5.1*	-11.4
Sample Size	**255**	**254**	**509**			**821**	**757**	**1,578**	

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.11

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY WORK REQUIREMENTS FOR MOTHERS RECEIVING AFDC/TANF

	Mothers of Children Under 1 Required to Work					Mothers of Children Under 1 Not Required to Work			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development									
Bayley Mental Development Index (MDI) Standard Score	92.5	91.0	1.5*	11.9		90.6	89.0	1.6*	12.7
Percentage with MDI < 85***[d]	24.2	28.3	-4.1	-8.8		29.6	34.7	-5.1	-10.9
Peabody Picture Vocabulary Test (PPVT)-III Standard Score	84.4	83.5	0.9	5.2		82.4	79.0	3.4***	20.6
Percentage with PPVT-III < 85***	45.5	50.3	-4.8	-9.5		55.9	64.2	-8.4**	-16.8
Child Social-Emotional Development									
Engagement of Parent During Parent-Child Semistructured Play	4.9	4.7	0.2**	16.3		4.8	4.5	0.3***	24.8
Sustained Attention with Objects During Parent-Child Semistructured Play	5.0	4.9	0.1*	12.7		4.9	4.7	0.2***	19.8
Engagement of Parent During Parent-Child Puzzle Challenge Task	5.0	5.0	0.0	1.6		5.0	4.9	0.1**	15.0
Persistence During Parent-Child Puzzle Challenge Task	4.7	4.5	0.2*	13.7		4.5	4.4	0.0	2.7
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	4.0	4.0	0.0	5.7		4.0	4.0	-0.0	-1.6
Bayley BRS: Orientation/ Engagement	3.9	3.9	0.1	6.2		3.8	3.8	0.0	2.5
Negativity Toward Parent During Parent-Child Semistructured Play	1.2	1.3	-0.1**	-16.6		1.3	1.4	-0.1*	-13.8
Frustration During Parent-Child Puzzle Challenge Task	2.7	2.8	-0.0	-2.2		2.7	2.6	0.1	7.5
Child Behavior Checklist—Aggressive Behavior**	11.2	11.0	0.2	3.3		10.2	11.6	-1.4***	-21.5
Child Health Status									
Child's Health Status	4.1	4.1	-0.0	-2.7		4.0	4.0	-0.0	-1.7
Percentage of Children in Fair or Poor Health***	6.4	7.0	-0.7	-2.3		9.2	9.7	-0.5	-1.8
Quality of the Home Environment and Parenting: Overall and Physical Environment									
Home Observation for Measurement of the Environment (HOME) Total Score	27.4	27.2	0.2	3.9		27.7	27.0	0.7**	14.2
HOME Internal Physical Environment	7.7	7.8	-0.1	-4.0		7.9	7.9	-0.0	-0.1
Parenting Behavior: Emotional Support									
HOME Warmth	2.5	2.4	0.1	11.8		2.6	2.5	0.1	7.5
Supportiveness During Parent-Child Semistructured Play	4.1	4.0	0.1	11.6		4.0	3.8	0.2**	17.6
Supportive Presence During Parent-Child Puzzle Challenge Task**	4.6	4.7	-0.1	-9.9		4.4	4.2	0.2**	17.5
Parenting Behavior: Stimulation of Language and Learning									
Percentage of Children with a Regular Bedtime***	63.0	58.1	4.9	9.9		57.0	57.5	-0.5	-0.9
Percentage of Children Who Follow a Bedtime Routine***	74.2	72.2	2.0	4.4		65.8	65.1	0.7	1.4

TABLE E.VI.11 (*continued*)

Outcome	Mothers of Children Under 1 Required to Work					Mothers of Children Under 1 Not Required to Work			
	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
HOME: Support of Language and Learning	10.8	10.6	0.2	7.2		10.5	10.3	0.2*	11.0
Parent-Child Play	4.5	4.4	0.1**	15.0		4.4	4.3	0.0	5.4
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.7	3.6	0.1	4.4		3.5	3.3	0.2**	16.9
Percentage of Parents Who Read to Child Daily***	63.1	55.3	7.9**	15.7		52.2	48.6	3.5	7.1
Percentage of Parents Who Read to Child at Bedtime***	39.1	33.2	5.9*	12.9		27.4	26.3	1.1	2.5
Parenting Behavior: Negative Parenting Behavior									
Detachment During Parent-Child Semistructured Play	1.2	1.2	-0.0	-4.3		1.2	1.3	-0.1	-12.0
Intrusiveness During Parent-Child Semistructured Play	1.4	1.5	-0.1**	-15.0		1.7	1.7	-0.0	-0.3
Detachment During Parent-Child Puzzle Challenge Task	1.7	1.6	0.1	5.8		1.6	1.7	-0.1	-8.7
Intrusiveness During Parent-Child Puzzle Challenge Task	2.5	2.6	-0.1	-7.7		2.8	2.8	-0.1	-3.7
Negative Regard During Parent-Child Semistructured Play	1.2	1.3	-0.0	-7.4		1.3	1.3	0.0	1.8
HOME Harshness	0.4	0.3	0.1	10.4		0.2	0.2	-0.0	-1.2
Percentage of Parents Who Spanked Child in the Past Week***	46.2	55.3	-9.1**	-18.2		47.0	53.0	-6.0*	-12.0
Knowledge of Safety Practices and Discipline Strategies									
Percentage of Parents Who Usually Use a Car Seat Correctly***	75.1	77.0	-1.9	-4.1		66.3	66.5	-0.3	-0.6
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	39.8	47.5	-7.7**	-15.4		50.9	52.7	-1.8	-3.6
Percentage of Parents Who Would Use Mild Discipline Only***	50.3	44.7	5.7*	11.5		40.6	38.0	2.5	5.1
Index of Severity of Discipline Strategies	3.2	3.4	-0.2**	-13.9		3.5	3.6	-0.1	-7.1
Parent Physical and Mental Health									
Parent's Health Status	3.5	3.5	-0.0	-1.9		3.4	3.5	-0.1	-9.1
Parenting Stress Index (PSI) Parental Distress**	25.1	24.4	0.6	6.5		24.5	26.1	-1.5**	-15.9
PSI Parent-Child Dysfunctional Interaction***	18.1	17.1	1.1**	17.1		17.5	18.1	-0.6	-10.2
Center for Epidemiological Studies Depression (CES-D; Short Form)	8.7	8.3	0.4	5.1		6.5	7.1	-0.5	-7.3
CES-D Severe Depressive Symptoms***	17.3	15.2	2.2	6.0		12.8	13.5	-0.8	-2.1
Family Environment Scale (FES): Family Conflict	1.6	1.7	-0.0	-7.0		1.7	1.7	-0.0	-1.1
Father Presence									
Currently Married to Biological Father***	35.7	39.2	-3.5	-7.2		33.8	33.6	0.1	0.3
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	47.3	52.3	-4.9	-9.9		50.1	49.7	0.4	0.9

TABLE E.VI.11 (*continued*)

Outcome	Mothers of Children Under 1 Required to Work					Mothers of Children Under 1 Not Required to Work			
	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Biological Father Currently Present in Child's Life***	69.2	71.1	-1.9	-4.2		75.2	70.9	4.3	9.5
Continuous Biological Father Presence Child Age 14-36 Months***	65.0	69.7	-4.7	-10.3		68.8	68.1	0.7	1.5
No Biological Father Presence Child Age 14-36 Months	13.5	13.4	0.1	0.3		11.4	11.3	0.1	0.4
Continuous Male Presence Child Age 14-36 Months***	79.2	86.4	-7.3**	-20.3		79.9	80.9	-1.0	-2.7
No Male Presence Child Age 14-36 Months***	2.0	2.0	0.0	0.1		2.4	1.6	0.8	6.6
Sample Size									
Bayley	**401**	**335**	**736**			**478**	**444**	**922**	
Parent Interview	**515**	**438**	**953**			**592**	**565**	**1,157**	
Parent-Child Interactions	**425**	**352**	**777**			**449**	**432**	**881**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.12

IMPACTS ON SELF-SUFFICIENCY AT 28 MONTHS, BY WORK REQUIREMENTS FOR MOTHERS RECEIVING AFDC/TANF

	Mothers of Children Under 1 Required to Work					Mothers of Children Under 1 Not Required to Work			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Education/Job Training									
Ever in Education or Training***[d]	60.9	54.5	6.4*	12.7		59.5	48.9	10.7***	21.3
Ever in High School***	9.5	6.8	2.7	9.6		16.5	10.3	6.2***	21.6
Ever in ESL Class***	1.8	2.5	-0.7	-4.7		4.8	2.7	2.0*	14.2
Ever in Vocational Program***	19.8	18.5	1.2	3.2		20.1	16.6	3.5	9.3
Average Hours per Week in Education or Training	4.3	3.3	1.0**	16.1		4.8	3.7	1.1**	17.9
In Education or Training:									
1st Quarter***	24.9	23.9	1.0	2.4		20.6	21.6	-1.0	-2.4
2nd Quarter***	29.0	27.4	1.6	3.7		25.7	24.0	1.8	4.1
3rd Quarter***	31.6	27.4	4.2	9.5		31.6	26.0	5.5**	12.6
4th Quarter***	32.6	24.8	7.8***	18.3		29.8	25.9	3.9	9.2
5th Quarter***	32.9	25.1	7.8***	18.2		29.0	26.2	2.8	6.5
6th Quarter***	30.4	23.8	6.6**	15.9		29.3	22.3	6.9**	16.7
7th Quarter***	23.7	23.5	0.2	0.4		28.1	19.7	8.4***	20.9
8th Quarter***	25.6	23.1	2.6	6.5		27.2	17.6	9.6***	24.5
Have High School Diploma***	55.0	60.0	-5.0*	-10.1		47.1	42.8	4.4	8.7
Have GED***	12.4	13.4	-1.0	-3.1		8.6	9.4	-0.8	-2.6
Employment									
Ever Employed***	90.6	91.9	-1.2	-3.2		84.0	78.6	5.3*	14.2
Average Hours/Week Employed	20.6	20.4	0.2	1.5		14.7	14.5	0.2	1.1
Employed in:									
1st Quarter***	51.7	50.6	1.1	2.3		30.0	30.3	-0.3	-0.6
2nd Quarter***	56.4	57.7	-1.3	-2.7		38.1	36.9	1.3	2.6
3rd Quarter***	62.8	64.9	-2.1	-4.3		46.0	43.8	2.2	4.4
4th Quarter***	66.7	67.1	-0.4	-0.7		49.8	47.1	2.7	5.3
5th Quarter***	72.1	70.3	1.8	3.6		53.9	52.9	1.0	2.1
6th Quarter***	73.3	70.7	2.6	5.3		57.3	51.9	5.4	10.9
7th Quarter***	69.2	65.7	3.5	7.1		53.7	52.4	1.4	2.8
8th Quarter***	71.5	69.5	2.0	4.1		57.5	55.9	1.6	3.3
Any Self-Sufficiency-Oriented Activity (Education, Training or Employment)									
Ever Employed or in Education/Training***	95.8	96.2	-0.4	-1.4		92.5	87.3	5.2**	17.1
Average Hours per Week in Any Activity	25.4	24.1	1.3	8.0		20.2	18.7	1.6	10.1
In Activities in:									
1st Quarter***	64.3	63.3	1.1	2.2		45.9	44.8	1.1	2.2
2nd Quarter***	71.2	70.2	1.0	2.0		56.2	51.0	5.2*	10.5
3rd Quarter***	76.9	77.5	-0.6	-1.3		65.7	58.5	7.2**	15.2
4th Quarter***	79.8	76.6	3.2	6.7		67.1	59.6	7.5	15.6
5th Quarter***	82.6	80.0	2.6	5.6		68.6	64.3	4.2	9.2
6th Quarter***	82.7	78.4	4.3	9.2		72.6	61.7	11.0***	23.4
7th Quarter***	77.2	74.8	2.4	5.0		67.7	60.8	6.9**	14.5
8th Quarter***	79.8	76.9	2.9	6.3		70.0	63.5	6.5**	13.9

TABLE E.VI.12 (*continued*)

Outcome	Mothers of Children Under 1 Required to Work					Mothers of Children Under 1 Not Required to Work			
	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
AFDC/TANF Receipt									
Ever Received AFDC/TANF***	40.0	34.4	5.6**	11.2		51.7	52.3	-0.6	-1.1
Received AFDC/TANF in:									
1st Quarter***	26.7	23.8	2.8	6.0		38.9	36.0	2.9	6.2
2nd Quarter***	26.4	23.4	2.9	6.1		40.0	39.6	0.4	0.9
3rd Quarter***	26.8	23.0	3.8	8.0		43.4	42.3	1.1	2.2
4th Quarter***	21.4	18.9	2.5	5.4		36.7	36.8	-0.1	-0.2
5th Quarter***	22.0	17.3	4.7*	10.3		34.9	36.8	-1.9	-4.0
6th Quarter***	21.4	16.7	4.8*	10.3		34.1	38.4	-4.4	-9.4
7th Quarter***	17.5	15.0	2.4	5.5		26.4	32.9	-6.4**	-14.6
8th Quarter***	17.6	13.4	4.2*	9.8		25.2	29.1	-4.0	-9.4
Total AFDC/TANF Benefits ($)	$1,290	$1,095	$195	5.1		$2,754	$2,859	-$105	-2.7
Receipt of Other Welfare Benefits									
Ever Received Welfare***	66.5	61.9	4.7*	9.9		69.1	70.1	-1.0	-2.1
Total Welfare Benefits ($)***	$4,695	$3,774	$921*	12.2		$5,745	$6,802	-$1,057**	-14.0
Ever Received Food Stamps***	58.4	56.3	2.1	4.3		62.2	61.6	0.6	1.2
Total Food Stamp Benefits ($)	$1,795	$1,662	$133	4.9		$2,330	$2,324	$6	0.2
Income/Poverty									
Income Above Poverty Level***	43.9	50.5	-6.6*	-13.3		42.5	37.8	4.7	9.5
Subsequent Births									
Subsequent Birth by 24 Months after Random Assignment***	23.3	27.2	-3.9	-8.7		22.6	27.2	-4.6	-10.2
Sample Size	**468**	**438**	**906**			**608**	**573**	**1,181**	

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.13

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY WHETHER PROGRAM IS LOCATED IN AN URBAN AREA

	Urban Sites					Rural or Non-Urban Sites			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development									
Bayley Mental Development Index (MDI) Standard Score	92.1	90.6	1.5**	11.7		89.9	87.7	2.2*	17.3
Percentage with MDI < 85***[d]	24.6	30.4	-5.7*	-12.3		33.6	36.0	-2.4	-5.2
Peabody Picture Vocabulary Test (PPVT)-III Standard Score	83.7	81.1	2.7**	16.2		82.0	80.3	1.7	10.1
Percentage with PPVT-III < 85***	48.3	56.2	-7.9**	-15.8		58.9	63.1	-4.1	-8.3
Child Social-Emotional Development									
Engagement of Parent During Parent-Child Semistructured Play	4.8	4.6	0.2***	22.0		4.8	4.6	0.2*	18.1
Sustained Attention with Objects During Parent-Child Semistructured Play	5.0	4.8	0.2***	17.9		4.9	4.8	0.2	15.7
Engagement of Parent During Parent-Child Puzzle Challenge Task	5.0	5.0	0.1	6.6		5.0	4.8	0.2*	16.8
Persistence During Parent-Child Puzzle Challenge Task	4.6	4.5	0.1	7.4		4.6	4.5	0.1	7.8
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	4.0	4.0	-0.0	-1.9		4.1	4.1	0.0	1.6
Bayley BRS: Orientation/ Engagement	3.9	3.9	-0.0	-2.9		3.8	3.7	0.2**	20.5
Negativity Toward Parent During Parent-Child Semistructured Play	1.3	1.3	-0.1	-10.6		1.2	1.3	-0.1	-11.3
Frustration During Parent-Child Puzzle Challenge Task	2.7	2.7	-0.0	-0.5		2.6	2.5	0.2	13.0
Child Behavior Checklist—Aggressive Behavior	10.6	11.5	-0.9**	-13.7		10.7	11.1	-0.3	-4.8
Child Health Status									
Child's Health Status	4.0	4.1	-0.1	-6.2		4.1	4.0	0.1	9.2
Percentage of Children in Fair or Poor Health***	8.3	8.2	0.1	0.3		7.3	9.4	-2.1	-7.4
Quality of the Home Environment and Parenting: Overall and Physical Environment									
Home Observation for Measurement of the Environment (HOME) Total Score	27.6	27.1	0.6**	11.3		27.5	27.0	0.5	9.8
HOME Internal Physical Environment	7.8	7.7	0.0	2.1		7.9	8.0	-0.1	-4.6
Parenting Behavior: Emotional Support									
HOME Warmth	2.6	2.5	0.1	7.4		2.6	2.5	0.1	8.6
Supportiveness During Parent-Child Semistructured Play	4.0	3.9	0.1**	13.7		4.0	3.8	0.2*	17.1
Supportive Presence During Parent-Child Puzzle Challenge Task	4.5	4.4	0.1	8.2		4.3	4.4	-0.1	-5.3
Parenting Behavior: Stimulation of Language and Learning									
Percentage of Children with a Regular Bedtime***	57.3	58.8	-1.4	-2.9		64.2	57.6	6.5	13.2
Percentage of Children Who Follow a Bedtime Routine***	68.9	68.1	0.8	1.7		70.2	70.5	-0.2	-0.5

TABLE E.VI.13 (*continued*)

	Urban Sites					Rural or Non-Urban Sites			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
HOME: Support of Language and Learning	10.7	10.5	0.2*	10.2		10.4	10.2	0.2	9.2
Parent-Child Play	4.4	4.3	0.0	4.1		4.5	4.3	0.2**	21.7
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.6	3.4	0.2**	15.1		3.5	3.5	0.0	1.8
Percentage of Parents Who Read to Child Daily***	56.5	52.6	3.8	7.7		58.1	50.1	8.0*	16.0
Percentage of Parents Who Read to Child at Bedtime***	31.7	29.9	1.8	3.9		33.9	27.0	6.8	15.0
Parenting Behavior: Negative Parenting Behavior									
Detachment During Parent-Child Semistructured Play	1.2	1.3	-0.1*	-13.2		1.2	1.2	-0.0	-4.3
Intrusiveness During Parent-Child Semistructured Play	1.6	1.6	0.0	0.6		1.6	1.7	-0.1*	-17.6
Detachment During Parent-Child Puzzle Challenge Task	1.6	1.7	-0.0	-4.6		1.6	1.6	0.0	2.7
Intrusiveness During Parent-Child Puzzle Challenge Task	2.6	2.7	-0.1	-6.4		2.8	2.8	-0.1	-4.4
Negative Regard During Parent-Child Semistructured Play	1.3	1.3	0.0	1.9		1.3	1.3	-0.0	-6.0
HOME Harshness	0.3	0.3	0.0	2.0		0.2	0.1	0.0	6.4
Percentage of Parents Who Spanked Child in the Past Week***	46.2	53.3	-7.1**	-14.2		47.8	56.4	-8.7**	-17.3
Knowledge of Safety Practices and Discipline Strategies									
Percentage of Parents Who Usually Use a Car Seat Correctly***	68.1	67.7	0.5	1.0		73.5	77.9	-4.4	-9.6
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	44.1	49.9	-5.9**	-11.7		51.9	52.8	-0.9	-1.8
Percentage of Parents Who Would Use Mild Discipline Only***	46.8	40.7	6.1**	12.4		39.4	40.1	-0.8	-1.5
Index of Severity of Discipline Strategies	3.3	3.5	-0.2**	-14.3		3.6	3.6	-0.0	-0.8
Parent Physical and Mental Health									
Parent's Health Status**	3.4	3.5	-0.1**	-12.1		3.6	3.5	0.1	14.0
Parenting Stress Index (PSI) Parental Distress	24.5	25.5	-1.0*	-10.9		25.2	25.3	-0.1	-0.9
PSI Parent-Child Dysfunctional Interaction	17.6	17.9	-0.2	-3.9		18.0	17.3	0.7	12.1
Center for Epidemiological Studies Depression (CES-D; Short Form)	7.4	7.8	-0.5	-6.4		7.4	7.0	0.4	6.1
CES-D Severe Depressive Symptoms ***	15.5	16.5	-1.0	-2.7		11.9	10.5	1.4	3.9
Family Environment Scale (FES): Family Conflict	1.7	1.7	-0.0	-2.1		1.6	1.6	-0.1	-10.8
Father Presence									
Currently Married to Biological Father ***	31.0	32.6	-1.6	-3.3		43.6	44.9	-1.2	-2.6
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	48.0	48.9	-0.9	-1.8		51.5	55.4	-3.9	-7.8
Biological Father Currently Present in Child's Life***	73.3	69.9	3.4	7.6		71.9	73.4	-1.5	-3.4
Continuous Biological Father Involvement Child Age 14-36 Months***	68.1	67.6	0.5	1.0		65.3	67.6	-2.3	-5.0

TABLE E.VI.13 (*continued*)

Outcome	Urban Sites: Program Group Participants	Urban Sites: Control Group[a]	Urban Sites: Impact Estimate per Participant[b]	Urban Sites: Effect Size[c]	Rural or Non-Urban Sites: Program Group Participants	Rural or Non-Urban Sites: Control Group[a]	Rural or Non-Urban Sites: Impact Estimate per Participant[b]	Rural or Non-Urban Sites: Effect Size[c]
No Biological Father Involvement Child Age 14-36 Months***	12.0	12.1	-0.1	-0.2	12.8	11.8	1.0	3.3
Continuous Male Involvement Child Age 14-36 Months***	79.2	80.6	-1.4	-3.8	80.4	88.1	7.7**	-21.5
No Male Involvement Child Age 14-36 Months***	2.5	2.0	0.5	4.3	1.5	1.7	-0.2	-1.3
Sample Size								
Bayley	**492**	**430**	**922**		**387**	**349**	**736**	
Parent Interview	**623**	**565**	**1,188**		**484**	**438**	**922**	
Parent-Child Interactions	**484**	**438**	**922**		**390**	**346**	**736**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of structured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VI.14

IMPACTS ON SELF-SUFFICIENCY AT 28 MONTHS, BY WHETHER PROGRAM IS LOCATED IN AN URBAN AREA

	Urban Sites					Rural or Non-Urban Sites			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Education/Job Training									
Ever in Education or Training***[d]	60.9	51.0	9.9***	19.8		57.7	54.2	3.5	7.1
Ever in High School***	14.0	8.7	5.3***	18.4		12.7	9.8	2.9	10.2
Ever in ESL Class***	3.4	2.5	0.8	5.8		4.0	2.8	1.1	7.9
Ever in Vocational Program***	21.7	16.0	5.7**	15.0		15.7	21.4	-5.6	-14.9
Average Hours per Week in Education or Training	4.8	3.4	1.4***	22.1		4.2	3.6	0.6	8.8
In Education or Training:									
1st Quarter***	21.8	21.7	0.1	0.3		23.3	24.7	-1.3	-3.3
2nd Quarter***	27.1	24.6	2.5	5.9		27.0	28.1	-1.1	-2.5
3rd Quarter***	31.9	26.3	5.5**	12.5		30.3	29.5	0.8	1.8
4th Quarter***	31.7	24.8	6.9***	16.1		29.0	27.3	1.7	3.9
5th Quarter***	32.1	25.0	7.2***	16.6		26.4	28.7	-2.3	-5.3
6th Quarter***	31.7	22.6	9.1***	21.9		24.3	24.9	-0.6	-1.5
7th Quarter***	27.8	20.5	7.2***	18.0		22.2	24.0	-1.8	-4.4
8th Quarter***	28.3	19.8	8.5***	21.6		22.3	20.4	1.9	4.8
Have High School Diploma***	49.3	47.2	2.1	4.2		52.2	55.3	-3.1	-6.3
Have GED***	10.7	12.7	-2.1	-6.5		8.6	6.4	2.3	7.1
Employment									
Ever Employed***	87.7	83.6	4.1*	11.0		84.4	83.3	1.1	2.8
Average Hours/Week Employed	16.8	16.4	0.5	3.2		17.8	18.5	-0.7	-4.4
Employed in:									
1st Quarter***	35.8	38.0	-2.2	-4.5		46.5	39.1	7.4**	15.2
2nd Quarter***	43.1	45.0	-1.9	-3.9		51.8	44.9	6.9*	13.8
3rd Quarter***	51.7	51.7	0.0	0.0		55.7	53.0	2.7	5.3
4th Quarter***	56.1	54.7	1.4	2.8		58.1	55.6	2.5	5.0
5th Quarter***	59.5	59.4	0.1	0.2		65.6	60.8	4.8	9.7
6th Quarter***	62.8	58.5	4.3	8.7		66.5	61.9	4.6	9.3
7th Quarter***	59.4	55.3	4.1	8.3		61.7	61.8	-0.1	-0.2
8th Quarter***	63.7	60.4	3.2	6.6		62.3	62.0	0.3	0.7
Any Self-Sufficiency-Oriented Activity (Education, Training or Employment)									
Ever Employed or in Education/Training***	94.6	90.7	3.9**	12.8		92.4	90.2	2.3	7.4
Average Hours per Week in Any Activity	22.3	20.2	2.1**	13.5		22.3	22.2	0.2	1.0
In Activities in:									
1st Quarter***	51.0	50.5	0.5	1.0		59.3	55.5	3.7	7.5
2nd Quarter***	60.4	57.2	3.2	6.5		67.2	62.1	5.0	10.2
3rd Quarter***	69.7	64.7	5.0**	10.4		71.5	69.4	2.1	4.4
4th Quarter***	72.1	65.0	7.1***	14.9		72.6	69.3	3.3	6.9
5th Quarter***	74.0	68.7	5.2**	11.3		75.2	73.7	1.5	3.1
6th Quarter	76.6	66.8	9.8***	20.7		77.1	72.3	4.8	10.2
7th Quarter***	72.1	64.2	8.0***	16.6		70.5	69.9	0.6	1.2
8th Quarter***	75.6	67.9	7.7***	16.6		70.6	69.7	0.8	1.8

TABLE E.VI.14 (*continued*)

Outcome	Urban Sites: Program Group Participants	Urban Sites: Control Group[a]	Urban Sites: Impact Estimate per Participant[b]	Urban Sites: Effect Size[c]		Rural or Non-Urban Sites: Program Group Participants	Rural or Non-Urban Sites: Control Group[a]	Rural or Non-Urban Sites: Impact Estimate per Participant[b]	Rural or Non-Urban Sites: Effect Size[c]
AFDC/TANF Receipt									
Ever Received AFDC/TANF***	53.0	51.0	2.0	4.0		32.6	30.3	2.3	4.7
Received AFDC/TANF in:									
1st Quarter***	38.9	36.8	2.1	4.5		22.1	17.4	4.7*	10.0
2nd Quarter***	39.9	39.4	0.5	1.1		21.3	18.6	2.7	5.7
3rd Quarter***	42.9	40.2	2.7	5.6		21.8	21.6	0.2	0.5
4th Quarter***	36.7	35.8	0.9	1.9		15.3	15.9	-0.6	-1.2
5th Quarter***	34.9	35.1	-0.2	-0.5		17.2	14.9	2.3	5.1
6th Quarter***	34.4	35.6	-1.1	-2.5		15.7	16.7	-1.1	-2.4
7th Quarter***	26.8	30.6	-3.9	-8.8		12.8	13.6	-0.8	-1.9
8th Quarter***	25.8	26.6	-0.9	-2.1		13.2	13.3	-0.1	-0.2
Total AFDC/TANF Benefits ($)	$2,616	$2,738	-$123	-3.2		$1,015	$806	$208	5.4
Receipt of Other Welfare Benefits									
Ever Received Welfare***	71.2	69.9	1.3	2.8		60.8	58.3	2.5	5.3
Total Welfare Benefits ($)	$6,016	$6,253	-$236	-3.1		$3,582	$3,693	-$112	-1.5
Ever Received Food Stamps***	64.0	62.6	1.4	2.8		52.9	51.3	1.6	3.2
Total Food Stamp Benefits ($)	$2,223	$2,228	-$6	-0.2		$1,837	$1,636	$201	7.4
Income/Poverty									
Income Above Poverty Level***	43.4	40.7	2.7	5.4		41.8	50.1	-8.3*	-16.7
Subsequent Births									
Subsequent Birth by 24 Months after Random Assignment***	20.1	28.6	-8.4***	-18.8		29.9	23.0	6.9	15.4
Sample Size	**613**	**588**	**1,201**			**463**	**423**	**886**	

SOURCE: Parent Services Follow-Up Interviews completed an average of 17, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.1

POSSIBLE SUBGROUP CONFOUNDING

NOTABLE DIFFERENCES ACROSS KEY SUBGROUPS		
African American Families	**Hispanic Families**	**White, Non-Hispanic Families**
• Less likely to be in home-based programs (37 vs. 50-53%) • More likely to be in programs that were implemented incompletely (43 vs 17-26%) • More likely to include teenage mothers (52 vs. 29-32%) • More likely to enroll with firstborn children (69 vs 54-60%) • More likely to be in school or training when enrolled (34 vs 15%) and less likely to be neither employed nor in school (44 vs 59-63%) • More likely to be receiving welfare cash assistance (50 vs 23-31%) • Less likely to live with a spouse (7 vs 33-37%) and more likely to live alone (48 vs 25-34%) • Less likely to be at risk of depression (39 vs. 51-57%) • More likely to have 3-5 demographic risk factors (70 vs 49-56%) and 4-5 risk factors (36 vs 20-24%)	• More likely to be in later implemented programs (56 vs 21-37%) • Primary language less likely to be English (26 vs 97-98%) • Much less likely to have completed 12th grade or GED (28 vs 52- 67%)	• More likely to be in early implemented programs (54 vs 20-27%) • More likely to live in states with a welfare work requirement for parents of infants (62 vs 26-32%) • More likely to live in nonurban areas (59 vs 30-32%)

TABLE E.VII.1 *(continued)*

NOTABLE DIFFERENCES ACROSS KEY SUBGROUPS		
Families Who Enrolled Before Child Was Born	**Families Who Enrolled After Child Was Born**	
• More likely to be in mixed-approach programs (44 vs 25-35%) • More likely to live in an urban area (68 vs 56%) • More likely to be in high-risk group (4 to 5 factors)		
Families That Enrolled With Firstborn Child	**Families That Enrolled With Later-Born Child**	
• More likely to be African American (38 vs 28%) • More likely to include teenage mothers (55 vs 13%) • More likely to live with other adults (47 vs 25%) • More likely to be in school or training when enrolled (30 vs 8%) • More likely to have less than a high school diploma or GED when enrolled (52 vs 42%) • More likely to have 3-5 demographic risk factors (63 vs 49%)	• More likely to be neither employed nor in school or training when enrolled (68 vs 47%) • More likely to live with a spouse when enrolled (38 vs 18%)	

TABLE E.VII.1 *(continued)*

NOTABLE DIFFERENCES ACROSS KEY SUBGROUPS		
Families of Teenage Mothers	**Families With Older Mothers**	
• More likely to be African American (46 vs 27%) • More likely to live with other adults (59 vs 27%) • More likely to enroll with firstborn child (88 vs 47%) • More likely to be in school or training when enrolled (44 vs 8%) • More likely to have completed less than a high school diploma or GED (73 vs 32%) • More likely to have 3-5 demographic risk factors (87 vs 39%) and 4-5 risk factors (52 vs 11%)	• More likely to be white (42 vs 31%) • More likely to be employed (28 vs 16%) or neither employed nor in school or training (64 vs 39%) when enrolled • More likely to live with spouse (34 vs 11%)	
Families Who Were Receiving Cash Assistance at Enrollment	**Families Who Were Not Receiving Cash Assistance at Enrollment**	
• More likely to live in an urban area (66 vs 51%) • More likely to be African American (47 vs 25%) and less likely to be Hispanic (17 vs 30%) • More likely to be neither employed nor in school or training when enrolled (65 vs 52%) • More likely to live alone with children when enrolled (57 vs 26%) • More likely to have 3-5 demographic risk factors (81 vs 42%) and 4-5 risk factors (45 vs 14%)	• More likely to live in a state with a welfare work requirement for parents of infants (48 vs 33%) • More likely to be Hispanic (30 vs 17%) • Much more likely to be employed when enrolled (31 vs 13%) • More likely to live with a spouse when enrolled (38 vs 10%) • More likely to be at risk of depression (56 vs 45%)	

TABLE E.VII.1 *(continued)*

NOTABLE DIFFERENCES ACROSS KEY SUBGROUPS		
Families in Which Parent Was Initially Employed	**Families in Which Parent Was Initially in School or Job Training**	**Families in Which Parent Was Initially Neither Working Nor in School or Training**
• More likely to live in a state with work requirement for parents of infants (55 vs 36-39%) • Less likely to be receiving welfare cash assistance at enrollment (18 vs 40-41%) • More likely to enroll with an older infant (50 vs 36-37%) • More likely to have education beyond a high school diploma (34 vs 18-21%) • More likely to have 0-2 demographic risk factors (79 vs 26-33%) and 0-1 demographic risk factors (43 vs 8-11%)	• More likely to be in incompletely implemented programs • Less likely to be white (26 vs 40-41%) and more likely to be African American (54 vs 28-33%) • More likely to include teenage mothers (77 vs 27-28%) • More likely to have completed less than a high school diploma or GED (73 vs 29-46%) • More likely to enroll with firstborn child (86 vs 53-60%) • More likely to live with other adults (61 vs 31-35%) • Less likely to live with a spouse (8 vs 24-33%)	• More likely to be in home-based programs (50 vs 38-43%) • More likely to live with a spouse (33 vs 8-24%)

TABLE E.VII.1 *(continued)*

NOTABLE DIFFERENCES ACROSS KEY SUBGROUPS		
Families in Which Parent Had Less than 12th Grade Education When Enrolled	**Families in Which Parent Had Completed 12th Grade or GED When Enrolled**	**Families in Which Parent Had Completed More Than 12th Grade When Enrolled**
• More likely to be in later-implemented programs (43 vs 25-27%) and less likely to be in early-implemented program (30 vs 40-42%) • Less likely to live in a state with no welfare work requirement for parents of infants (66 vs 49-53%) • More likely to include teenage parents (59 vs 11-29%) • More likely to enroll with firstborn child (67 vs 56-59%) • More likely to live with other adults (49 vs 25-33%) and less likely to live alone (30 vs 41%) • Less likely to be white (26 vs 46-49%) and more likely to be Hispanic (35 vs 12-13%) • Less likely to be employed when enrolled (14 vs 30-34%) and more likely to be in school or training (33 vs 7-17%) • More likely to have 3-5 demographic risk factors (84 vs 24-42%) and 4-5 risk factors (50 vs 1-8%)	• More likely to be neither in school nor employed when enrolled (63 vs 50-53%) • More likely to have 2-3 demographic risk factors (67 vs 48-56%)	• More likely to be at risk of depression (57 vs 48-49%) • More likely to have 0-2 demographic risk factors (76 vs 16-58%) or 0-1 risk factors (43 vs 2-25%)

TABLE E.VII.1 *(continued)*

NOTABLE DIFFERENCES ACROSS KEY SUBGROUPS		
Families in Which Parent Lived With Spouse When Enrolled	**Families in Which Parent Lived With Other Adults When Enrolled**	**Families in Which Parent Lived Alone With Her Children When Enrolled**
• More likely to be in early-implemented programs (41 vs 30-35%) • More likely to live in a nonurban area (55 vs 35-39%) • More likely to be white (49 vs 32-35%) or Hispanic (34 vs 16-23%) • More likely to include older mothers (82 vs 41-67%) • More likely to be neither employed nor in school or training (71 vs 45-54%) • More likely to be at risk of depression (63 vs 47-49%) • More likely have 0-2 demographic risk factors (83 vs 24-33%) an 0-1 risk factors (47 vs 6-11%)	• More likely to be in mixed-approach programs (42 vs 26-31%) and less likely to be in home-based programs (36 vs 52-53%) • More likely to be in later-implemented programs (42 vs 28-33%) • More likely to include teenage mothers (58 vs 17-33%) • More likely to have completed less than a high school diploma or GED (60 vs 40%) and less likely to have completed more than 12th grade (15 vs 27-31%) • More likely to be in school or training when enrolled (35 vs 7-19%) • More likely to enroll with first child (76 vs 44-61%)	• More likely to be in incompletely-implemented programs (41 vs 23-26%) • More likely to be receiving welfare cash assistance when enrolled (54 vs 12-33%)

TABLE E.VII.1 *(continued)*

NOTABLE DIFFERENCES ACROSS KEY SUBGROUPS		
Families with 3-5 Demographic Risk Factors	**Families with 0-2 Demographic Risk Factors**	
• More likely to be African American (42 vs 24%) • More likely to be teenage mother (58 vs 11%) • More likely to enroll with firstborn child (68 vs 54%) • More likely to in school or training (27 vs 13%) or neither in school or training (64 vs 43%) when enrolled • More likely to have completed less than 12th grade or GED when enrolled (69 vs 18%) • More likely to live with other adults (51 vs 22%) or alone (41 vs 28%) when enrolled • More likely to be receiving welfare cash assistance when enrolled (51 vs 15%)	• More likely to live in a state with a welfare work requirement for parents of infants (52 vs 36%) • More likely to be white (46 vs 32%) • More likely to be employed when enrolled (44 vs 9%) • More likely to live with a spouse when enrolled (50 vs 8%) • More likely to be at risk of depression when enrolled (58 vs 46%)	

TABLE E.VII.1 *(continued)*

NOTABLE DIFFERENCES ACROSS KEY SUBGROUPS		
Families Not At Risk of Depression	**Families at Risk of Depression**	
• More likely to be in home-based programs (36 vs 25%) • More likely to be in incompletely implemented programs (36 vs 25%) • More likely to be African American (37 vs 23%) • More likely to live with spouse (32 vs 22%) • More likely to be receiving cash assistance at baseline (48 vs 37%) • More likely to be in early-implemented programs (67 vs 56%) • More likely to have 3-5 demographic risk factors (65 vs 52%)	• More likely to be in mixed-approach programs (61 vs 51%) • More likely to be in early-implemented programs (60 vs 48%) • More likely to be white (51 vs 40%) • More likely to live with a spouse (26 vs 16%)	

NOTE: Only differences greater than 10 percentage points are noted in the table.

TABLE E.VII.2

IMPACTS ON SERVICE RECEIPT DURING THE FIRST 28 MONTHS, BY AFDC/TANF RECEIPT AT ENROLLMENT

	Received AFDC/TANF				Did Not Receive AFDC/TANF		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Any Services							
Any Key Services***[a,b]	96.0	79.8	16.2***		95.5	80.6	14.9***
Any Home Visits Or Center-Based Child Care***	91.7	57.9	33.8***		92.5	57.8	34.6***
More Than 1 Home Visit or 2 Weeks Center-Based Child Care***	90.1	52.7	37.4***		92.0	53.6	38.5***
Home Visits or Center Care at Required Intensity in at Least 1 Followup***	72.3	5.5	66.8***		76.7	15.5	61.1***
Home Visits or Center Care at Required Intensity in All 3 Followups***	24.0	0.9	23.1***		35.6	4.7	30.9***
Home Visits							
Any Home Visits***	86.6	33.7	52.9***		86.4	33.2	53.2***
Any Child Development Services During Home Visits***	84.7	32.1	52.6***		86.0	31.7	54.3***
Weekly Home Visits, 1st Follow-Up Period***	47.5	2.9	44.6***		45.4	2.4	43.0***
Weekly Home Visits, 2nd Follow-Up Period***	34.6	0.5	34.1***		36.9	3.5	33.5***
Weekly Home Visits, 3rd Follow-Up Period***	34.2	1.2	33.0***		29.2	2.4	26.8***
Weekly Home Visits in At Least 1 Followup***	65.7	3.8	61.8***		56.7	6.2	50.5***
Weekly Home Visits in All 3 Followups***	17.3	0.7	16.6***		22.2	0.9	21.3***
Child Care							
Any Child Care***	83.8	80.5	3.3		83.3	77.8	5.5**
Any Center-Based Child Care***	43.2	34.2	9.0*		50.1	36.2	13.9***
Average Hours Per Week of Center-Based Care	4.0	2.5	1.5*		6.1	3.5	2.7***
Concurrent Child Care Arrangements***	43.7	42.3	1.4		49.3	47.6	1.7
Average Weekly Out-of-Pocket Cost of Care	$3.47	$6.74	-$3.27**		$5.02	$8.42	-$3.40***
Received a Child Care Subsidy***	51.3	63.4	-12.2		21.3	23.0	-1.7
Child Was in Care at 12 Months of Age***	72.4	57.9	14.5**		65.9	56.2	9.7***
Child Was in Care at 24 Months of Age***	69.2	56.0	8.1		62.3	57.6	4.7
Case Management							
Any Case Management Meetings***	85.1	59.0	26.0***		87.0	51.9	35.1***
Weekly Case Management, 1st Follow-Up Period***	44.7	9.7	35.0***		44.6	7.2	37.4***
Weekly Case Management, 2nd Follow-Up Period***	35.8	3.0	32.9***		34.6	6.4	28.2***
Weekly Case Management, 3rd Follow-Up Period***	28.1	4.2	23.9***		30.0	3.9	26.2***
Group Activities							
Any Group Parenting Activities***	67.9	31.3	36.6***		71.6	37.1	34.6***
Any Parent-Child Group Activities**	40.7	7.8	32.9***		42.0	15.3	26.6***

TABLE E.VII.2 (*continued*)

	Received AFDC/TANF				Did Not Receive AFDC/TANF		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Early Intervention Services							
Identification of Child's Disability***	7.5	4.8	2.7		7.7	5.7	2.0
Services for Child With Disability***	4.6	1.8	2.8		5.5	3.9	1.6
Child Health Services							
Any Child Health Services***	100.0	100.0	0.0		100.0	99.6	0.5
Any Doctor Visits***	99.1	97.6	1.5		98.4	98.0	0.5
Any Emergency Room Visits***	51.4	55.4	-4.0		51.5	51.2	0.3
Number of Emergency Room Visits for Injuries	0.3	0.2	0.0		0.2	0.3	-0.1*
Any Dentist Visits***	29.5	29.1	0.3		28.4	27.2	1.2
Any Screening Tests***	69.0	71.6	-2.6		65.0	62.5	2.5
Any Immunizations***	99.4	96.7	2.7**		98.0	97.9	0.1
Family Development Services							
Any Education-Related Services***	84.7	54.1	30.6***		85.0	56.5	28.6***
Any Employment-Related Services***	81.9	63.9	18.1***		72.6	40.3	32.3***
Any Family Health Services[c]	100.0	100.0	0.0		100.0	100.0	0.0
Any Family Mental Health Services***	28.1	23.2	4.9		21.4	22.2	-0.8
Transportation Assistance***	41.5	31.2	10.3**		26.8	20.6	6.2**
Housing Assistance***	73.2	74.9	-1.6		50.6	46.2	4.5
Sample Size	**285**	**265**	**550**		**577**	**534**	**1,111**

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroups are included in the estimates for each subgroup.

[a]Home visits, case management, center-based child care, and/or group parenting activities.

[b]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups in the first two columns.

[c]There is no variance across subgroups due to lack of variance in level of services.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

AFDC = Aid to Families with Dependent Children
TANF = Temporary Assistance for Needy Families

TABLE E.VII.3

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY AFDC/TANF RECEIPT AT ENROLLMENT

	Received AFDC/TANF					Did Not Receive AFDC/TANF			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development									
Bayley Mental Development Index (MDI) Standard Score	90.7	91.1	-0.4	-3.0		90.9	89.8	1.1	8.5
Percentage with MDI < 85***[d]	32.5	21.0	11.5	24.8		27.8	35.2	-7.4**	-15.8
Peabody Picture Vocabulary Test (PPVT)-III Standard Score	81.6	82.0	-0.4	-2.4		83.7	81.7	1.9	11.8
Percentage with PPVT-III < 85***	55.6	59.5	-4.0	-7.9		50.1	55.4	-5.3	-10.7
Child Social-Emotional Development									
Engagement of Parent During Parent-Child Semistructured Play	4.8	4.7	0.1	6.2		4.8	4.7	0.1	13.1
Sustained Attention with Objects During Parent-Child Semistructured Play	5.1	4.9	0.2	19.6		5.0	4.9	0.1	12.7
Engagement of Parent During Parent-Child Puzzle Challenge Task**	4.7	5.0	-0.3*	-28.9		5.1	5.0	0.1	7.4
Persistence During Parent-Child Puzzle Challenge Task	4.6	4.4	0.2	21.1		4.6	4.6	0.0	1.1
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	3.9	3.9	-0.0	-0.7		4.0	4.0	-0.1	-6.9
Bayley BRS: Orientation/ Engagement	3.6	3.7	-0.1	-12.0		3.9	3.8	0.1*	12.2
Negativity Toward Parent During Parent-Child Semistructured Play	1.2	1.4	-0.1	-20.3		1.2	1.3	-0.1**	-17.2
Frustration During Parent-Child Puzzle Challenge Task	2.5	2.9	-0.3	-25.2		2.8	2.8	-0.0	-0.2
Child Behavior Checklist—Aggressive Behavior	10.9	12.1	-1.2	-18.2		10.6	11.1	-0.4	-6.6
Child Health Status									
Child's Health Status	4.1	4.0	0.1	10.3		4.0	4.0	-0.0	-0.3
Percentage of Children in Fair or Poor Health***	10.1	9.1	1.0	3.5		6.7	7.8	-1.0	-3.5
Quality of the Home Environment and Parenting: Overall and Physical Environment									
Home Observation for Measurement of the Environment (HOME) Total Score	26.9	26.6	0.3	5.3		27.5	27.2	0.3	5.4
HOME Internal Physical Environment	7.7	7.8	-0.1	-9.6		7.8	7.9	-0.1	-8.0
Parenting Behavior: Emotional Support									
HOME Warmth	2.5	2.5	0.0	2.5		2.5	2.5	-0.0	-0.3
Supportiveness During Parent-Child Semistructured Play	4.0	3.9	0.1	10.3		4.0	3.9	0.1	8.4
Supportive Presence During Parent-Child Puzzle Challenge Task	4.3	4.5	-0.2	-13.9		4.6	4.5	0.1	4.3
Parenting Behavior: Stimulation of Language and Learning									
Percentage of Children with a Regular Bedtime***	66.9	59.3	7.6	15.4		57.4	57.5	-0.1	-0.2
Percentage of Children Who Follow a Bedtime Routine***	73.9	63.7	10.2*	22.0		68.9	65.9	3.1	6.6

TABLE E.VII.3 (*continued*)

	Received AFDC/TANF					Did Not Receive AFDC/TANF			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
HOME: Support of Language and Learning	10.5	10.2	0.3	13.1		10.5	10.5	0.0	1.7
Parent-Child Play	4.4	4.3	0.1	6.9		4.4	4.4	0.0	0.0
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.6	3.4	0.2	16.1		3.7	3.6	0.1	5.2
Percentage of Parents Who Read to Child Daily***	58.4	49.1	9.3	18.6		55.6	51.9	3.7	7.4
Percentage of Parents Who Read to Child at Bedtime***	40.0	26.3	7.7	16.9		32.0	28.8	3.3	7.2
Parenting Behavior: Negative Parenting Behavior									
Detachment During Parent-Child Semistructured Play	1.3	1.2	0.1	10.4		1.2	1.2	-0.0	-3.8
Intrusiveness During Parent-Child Semistructured Play	1.6	1.6	-0.1	-7.7		1.5	1.6	-0.1	-10.5
Detachment During Parent-Child Puzzle Challenge Task	1.8	1.6	0.2	22.7		1.6	1.5	0.1	9.0
Intrusiveness During Parent-Child Puzzle Challenge Task	2.7	2.9	-0.2	-19.2		2.6	2.6	-0.1	-5.7
Negative Regard During Parent-Child Semistructured Play	1.3	1.4	-0.0	-0.9		1.3	1.2	0.0	5.5
HOME Harshness	0.3	0.3	-0.0	-2.8		0.2	0.3	-0.0	-2.1
Percentage of Parents Who Spanked Child in the Past Week***	44.1	54.6	-10.5*	-21.0		47.4	52.0	-4.6	-9.3
Knowledge of Safety Practices and Discipline Strategies									
Percentage of Parents Who Usually Use a Car Seat Correctly***	71.0	64.1	6.9	15.0		70.2	71.0	-0.8	-1.8
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	47.9	55.7	-7.8	-15.5		45.5	50.2	-4.7	-9.3
Percentage of Parents Who Would Use Mild Discipline Only***	43.5	37.6	5.9	12.0		44.5	40.7	3.8	7.7
Index of Severity of Discipline Strategies	3.4	3.7	-0.3*	-17.9		3.3	3.5	-0.1	-8.2
Parent Physical and Mental Health									
Parent's Health Status	3.3	3.4	-0.0	-3.1		3.5	3.5	-0.0	-1.9
Parenting Stress Index (PSI) Parental Distress	25.6	27.0	-1.5	-15.2		24.6	25.3	-0.7	-7.3
PSI Parent-Child Dysfunctional Interaction	18.2	18.8	-0.7	-10.6		18.0	17.6	0.4	6.4
Center for Epidemiological Studies Depression (CES-D; Short Form)	8.6	9.0	-0.5	-6.9		6.6	7.1	-0.5	-6.7
CES-D Severe Depressive Symptoms ***	19.4	20.4	-1.0	-2.7		11.2	13.5	-2.2	-6.2
Family Environment Scale (FES): Family Conflict	1.7	1.8	-0.1	-15.9		1.7	1.7	0.0	2.0
Father Presence									
Currently Married To Biological Father ***	22.1	22.5	-0.4	-0.8		42.4	43.9	-1.4	-2.9
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	37.3	38.8	-1.4	-2.9		55.5	57.5	-2.0	-4.0
Biological Father Currently Present in Child's Life***	62.7	61.9	0.9	1.9		79.2	76.1	3.1	6.9

TABLE E.VII.3 (*continued*)

	Received AFDC/TANF					Did Not Receive AFDC/TANF			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Continuous Biological Father Presence Child Age 14-36 Months***	54.7	63.3	-8.6	-18.8		74.3	74.2	0.1	0.2
No Biological Father Presence Child Age 14-36 Months***	16.7	15.5	1.2	3.8		8.7	8.7	-0.1	-0.3
Continuous Male Presence Child Age 14-36 Months***	77.5	71.6	5.8	16.3		83.8	87.2	-3.4	-9.5
No Male Presence Child Age 14-36 Months***	2.5	2.3	0.2	1.4		2.0	1.9	0.1	1.0
Sample Size									
Bayley	**233**	**205**	**438**			**469**	**406**	**875**	
Parent Interview	**294**	**269**	**563**			**604**	**537**	**1,141**	
Parent-Child Interactions	**234**	**195**	**429**			**471**	**428**	**899**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.4

IMPACTS ON SELF-SUFFICIENCY AT 28 MONTHS, BY AFDC/TANF RECEIPT AT ENROLLMENT

	Received AFDC/TANF					Did Not Receive AFDC/TANF			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Education/Job Training									
Ever in Education or Training***[d]	59.1	47.2	11.9**	23.7		56.5	48.6	7.9**	15.8
Ever in High School***	7.9	3.3	4.6*	16.1		11.8	8.1	3.7**	12.8
Ever in ESL Class***	0.6	3.1	-2.5*	-17.2		4.7	3.0	1.7	11.8
Ever in Vocational Program***	20.1	16.7	3.4	9.1		15.6	15.8	-0.3	-0.7
Average Hours per Week in Education or Training	3.6	2.7	0.9	14.4		4.8	3.4	1.4***	21.3
In Education or Training:									
1st Quarter***	21.5	22.4	-0.9	-2.1		20.2	21.7	-1.6	-3.8
2nd Quarter***	24.4	24.1	0.3	0.7`		24.6	26.0	-1.4	-3.2
3rd Quarter***	31.6	26.4	5.1	11.8		28.1	23.7	4.5*	10.1
4th Quarter***	28.3	24.2	4.1	9.5		28.8	22.2	6.7**	15.5
5th Quarter***	26.6	26.9	-0.3	-0.6		29.5	22.9	6.6**	15.3
6th Quarter***	23.4	21.5	1.9	4.7		30.5	22.0	8.5***	20.3
7th Quarter***	18.7	13.6	5.1	12.6		28.3	20.5	7.8***	19.4
8th Quarter***	20.1	12.5	7.6*	19.3		26.5	19.5	7.0**	17.8
Have High School Diploma***	38.1	40.8	-2.7	-5.4		54.5	52.6	1.9	3.7
Have GED***	17.8	14.4	3.4	10.8		8.0	7.8	0.1	0.5
Employment									
Ever Employed***	82.6	80.8	1.8	4.7		88.1	82.4	5.7**	15.2
Average Hours/Week Employed	13.3	15.8	-2.5	-16.9		19.3	18.4	0.9	6.4
Employed in:									
1st Quarter***	25.8	32.3	-6.5	-13.4		46.7	45.1	1.5	3.1
2nd Quarter***	33.5	39.4	-5.8	-11.7		52.9	50.4	2.5	5.0
3rd Quarter***	42.9	43.5	-0.6	-1.3		59.4	56.3	3.2	6.3
4th Quarter***	51.3	42.0	9.3*	18.6		61.7	59.9	1.8	3.6
5th Quarter***	52.5	53.2	-0.7	-1.5		65.5	62.0	3.4	7.0
6th Quarter***	54.3	56.9	-2.5	-5.2		66.3	62.3	4.0	8.2
7th Quarter***	50.7	53.6	-2.9	-5.7		62.2	59.3	2.9	5.8
8th Quarter**	57.8	59.7	-1.9	-4.0		64.3	61.9	2.4	5.0
Any Self-Sufficiency-Oriented Activity (Education, Training or Employment)									
Ever Employed or in Education/Training***	91.4	88.9	2.5	8.3		93.9	89.8	4.1**	13.6
Average Hours per Week in Any Activity*	17.3	18.8	-1.5	-9.7		24.5	22.0	2.5**	15.9
In Activities in:									
1st Quarter***	44.1	43.8	0.3	0.6		57.5	56.7	0.8	1.5
2nd Quarter***	53.6	50.7	3.2	6.5		65.9	62.5	3.4	6.9
3rd Quarter***	63.1	60.0	3.2	6.7		73.0	67.1	5.9**	12.4
4th Quarter***	65.8	56.9	8.9*	18.7		74.9	67.4	7.5***	15.7
5th Quarter***	64.6	67.7	-3.1	-6.6		76.0	69.0	7.0**	15.1
6th Quarter***	68.4	67.9	0.5	1.1		77.6	69.9	7.7***	16.3
7th Quarter***	60.9	61.1	-0.2	-0.4		74.5	67.0	7.5**	15.6
8th Quarter***	68.6	63.5	5.1	10.9		74.9	69.6	5.3*	11.3

TABLE E.VII.4 (*continued*)

	Received AFDC/TANF					Did Not Receive AFDC/TANF			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
AFDC/TANF Receipt									
Ever Received AFDC/TANF***	85.8	83.6	2.2	4.5		29.2	27.3	1.9	3.8
Received AFDC/TANF in:									
1st Quarter***	78.6	71.9	6.7	14.3		16.0	14.6	1.4	3.0
2nd Quarter***	76.3	72.5	3.8	8.1		17.5	15.5	2.0	4.2
3rd Quarter**	75.3	71.2	4.1	8.6		19.9	20.2	-0.3	-0.7
4th Quarter***	61.5	61.1	0.4	0.8		17.9	17.5	0.4	1.0
5th Quarter**	58.8	59.3	-0.5	-1.2		17.3	18.0	-0.7	-1.5
6th Quarter***	57.8	57.4	0.3	0.7		18.4	19.2	-0.8	-1.7
7th Quarter***	52.5	50.3	2.2	4.9		13.1	14.8	-1.7	-3.8
8th Quarter***	50.7	41.9	8.8	20.7		12.4	13.4	-1.0	-2.4
Total AFDC/TANF Benefits ($)*	$6,177	$6,207	-$30	-0.8		$1,041	$1,141	-$100	-2.6
Receipt of Other Welfare Benefits									
Ever Received Welfare***	94.7	94.0	0.7	1.6		58.5	54.4	4.2	8.9
Total Welfare Benefits ($)*	$12,690	$12,823	-$133	-1.8		$3,405	$3,779	-$374	-4.9
Ever Received Food Stamps***	89.1	89.9	-0.8	-1.6		50.7	46.1	4.6	9.5
Total Food Stamp Benefits ($)	$4,334	$4,042	$292	10.7		$1,474	$1,408	$66	2.4
Income/Poverty									
Income Above Poverty Level***	26.9	32.3	-5.4	-11.0		48.5	47.2	1.4	2.8
Subsequent Births									
Subsequent Birth by 24 Months after Random Assignment***	20.7	33.8	-13.1**	-29.1		20.9	22.2	-1.3	-2.8
Sample Size	**285**	**265**	**550**			**577**	**534**	**1,111**	

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.5

IMPACTS ON SERVICE RECEIPT DURING THE FIRST 28 MONTHS, BY FOCUS CHILD'S GENDER

	Female				Male		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Any Services							
Any Key Services***[a,b]	95.4	80.1	15.3***		96.3	83.0	13.3***
Any Home Visits Or Center-Based Child Care***	92.1	56.1	36.0***		93.8	59.9	33.9***
More Than 1 Home Visit or 2 Weeks Center-Based Child Care***	91.2	50.2	40.9***		92.7	53.5	39.1***
Home Visits or Center Care at Required Intensity in at Least 1 Followup***	74.5	13.1	61.4***		74.0	14.5	59.5***
Home Visits or Center Care at Required Intensity in All 3 Followups***	30.9	3.7	27.2***		29.8	3.0	26.8***
Home Visits							
Any Home Visits***	85.8	33.6	52.2***		88.5	34.2	54.3***
Any Child Development Services During Home Visits***	84.0	31.1	52.8***		88.3	32.1	56.3***
Weekly Home Visits, 1st Follow-Up Period***	43.3	2.9	40.4***		47.5	3.5	44.1***
Weekly Home Visits, 2nd Follow-Up Period***	35.0	2.1	33.0***		35.2	2.7	32.5***
Weekly Home Visits, 3rd Follow-Up Period***	27.5	2.3	25.2***		30.3	2.4	27.9***
Weekly Home Visits in At Least 1 Followup***	55.4	5.4	50.0***		58.1	5.1	53.0***
Weekly Home Visits in All 3 Followups***	17.0	0.3	16.7***		20.1	0.7	19.4***
Child Care							
Any Child Care***	85.6	80.7	4.9**		87.3	78.9	8.4***
Any Center-Based Child Care***	50.7	35.4	15.3***		50.3	35.6	14.7***
Average Hours Per Week of Center-Based Care	6.6	3.1	3.5***		5.8	3.3	2.5***
Concurrent Child Care Arrangements***	52.5	47.3	5.2		51.1	41.8	9.3***
Average Weekly Out-of-Pocket Cost of Care	$4.44	$7.05	-$2.62***		$4.51	$7.03	-$2.52**
Received a Child Care Subsidy***	30.6	32.6	-2.0		29.7	32.3	-2.6
Child Was in Care at 12 Months of Age***	67.1	59.1	8.1**		66.4	51.1	15.3***
Child Was in Care at 24 Months of Age***	64.3	57.8	6.5*		61.9	50.3	11.7***
Case Management							
Any Case Management Meetings***	86.4	55.3	31.1***		87.6	55.1	32.5***
Weekly Case Management, 1st Follow-Up Period***	45.3	7.5	37.8***		47.1	10.1	37.0***
Weekly Case Management, 2nd Follow-Up Period***	33.0	4.9	28.1***		35.2	5.5	29.7***
Weekly Case Management, 3rd Follow-Up Period***	25.9	4.5	21.4***		31.4	4.7	26.7***
Group Activities							
Any Group Parenting Activities	68.7	36.4	32.4***		73.4	38.3	35.1***
Any Parent-Child Group Activities**	40.4	13.7	26.7***		42.8	14.9	27.9***

TABLE E.VII.5 (*continued*)

	Female				Male		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Early Intervention Services							
Identification of Child's Disability***	5.6	3.9	1.7		8.8	7.0	1.8
Services for Child With Disability***	3.7	2.3	1.4		5.6	4.9	0.7
Child Health Services							
Any Child Health Services***	100.0	99.8	0.2		100.0	99.7	0.3
Any Doctor Visits***	99.4	98.0	1.4**		98.5	99.0	-0.4
Any Emergency Room Visits***	48.1	50.8	-2.7		60.2	56.0	4.2
Number of Emergency Room Visits for Injuries	0.2	0.3	-0.1*		0.3	0.3	0.0
Any Dentist Visits***	32.0	24.0	8.0***		24.5	29.0	-4.5
Any Screening Tests***	66.9	66.8	0.1		66.9	66.6	0.3
Any Immunizations***	99.4	97.5	1.8**		98.2	98.0	0.1
Family Development Services							
Any Education-Related Services***	87.3	60.3	27.0***		87.8	56.5	31.2***
Any Employment-Related Services***	76.8	47.6	29.1***		76.7	44.7	32.0***
Any Family Health Services[c]	100.0	100.0	0.0		100.0	100.0	0.0
Any Family Mental Health Services***	21.9	18.6	3.3		23.3	24.7	-1.5
Transportation Assistance***	31.0	22.3	8.6***		35.3	23.3	12.0***
Housing Assistance***	57.6	57.0	0.6		58.7	56.9	1.9
Sample Size	**530**	**503**	**1,033**		**545**	**508**	**1,053**

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroups are included in the estimates for each subgroup.

[a]Home visits, case management, center-based child care, and/or group parenting activities.

[b]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups in the first two columns.

[c]There is no variance across subgroups due to lack of variance in level of services.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.6

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY FOCUS CHILD'S GENDER

	Female					Male			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development									
Bayley Mental Development Index (MDI) Standard Score	92.2	90.9	1.4	10.6		90.8	89.0	1.8**	13.9
Percentage with MDI < 85***[d]	26.9	29.2	-2.3	-4.9		27.6	34.0	-6.4*	-13.8
Peabody Picture Vocabulary Test (PPVT)-III Standard Score	86.0	83.7	2.3*	14.2		82.2	80.7	1.5	8.9
Percentage with PPVT-III < 85***	42.9	47.9	-5.0	-9.9		55.7	60.3	-4.6	-9.3
Child Social-Emotional Development									
Engagement of Parent During Parent-Child Semistructured Play	4.9	4.7	0.2**	19.4		4.8	4.6	0.2**	17.9
Sustained Attention with Objects During Parent-Child Semistructured Play	5.1	4.9	0.2**	15.6		4.9	4.8	0.2**	16.0
Engagement of Parent During Parent-Child Puzzle Challenge Task	5.0	4.9	0.1*	14.7		5.0	5.0	0.0	1.5
Persistence During Parent-Child Puzzle Challenge Task	4.8	4.6	0.1	10.6		4.4	4.3	0.1	5.7
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	4.1	4.1	-0.0	-0.5		3.9	3.9	0.0	0.1
Bayley BRS: Orientation/ Engagement	3.9	3.9	0.1	6.5		3.8	3.8	0.0	0.9
Negativity Toward Parent During Parent-Child Semistructured Play**	1.3	1.3	0.0	0.6		1.2	1.4	-0.2***	-25.0
Frustration During Parent-Child Puzzle Challenge Task	2.7	2.7	0.0	0.1		2.7	2.7	0.0	1.8
Child Behavior Checklist—Aggressive Behavior	10.2	10.7	-0.5	-8.3		11.1	11.8	-0.7	-10.5
Child Health Status									
Child's Health Status*	4.0	4.1	-0.1	-11.3		4.0	4.0	0.1	6.9
Percentage of Children in Fair or Poor Health*	7.9	8.2	-0.3	-1.1		8.3	8.7	-0.4	-1.3
Quality of the Home Environment and Parenting: Overall and Physical Environment									
Home Observation for Measurement of the Environment (HOME) Total Score	28.0	27.2	0.8**	15.7		27.2	27.0	0.2	4.2
HOME Internal Physical Environment	7.9	7.9	0.1	4.9		7.8	7.8	-0.1	-4.5
Parenting Behavior: Emotional Support									
HOME Warmth	2.6	2.5	0.1	10.1		2.6	2.5	0.1	7.1
Supportiveness During Parent-Child Semistructured Play	4.1	3.9	0.2**	19.0		3.9	3.9	0.1	8.6
Supportive Presence During Parent-Child Puzzle Challenge Task	4.4	4.4	0.0	2.7		4.5	4.4	0.0	2.8
Parenting Behavior: Stimulation of Language and Learning									
Percentage of Children with a Regular Bedtime***	58.4	59.6	-1.2	-2.5		60.0	56.7	3.3	6.7
HOME: Support of Language and Learning	10.8	10.5	0.3**	15.3		10.5	10.4	0.1	3.4
Parent-Child Play	4.5	4.4	0.1*	13.5		4.4	4.3	0.0	3.8
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.6	3.5	0.1	7.7		3.6	3.5	0.1	8.6
Percentage of Children Who Follow a Bedtime Routine***	70.7	69.0	1.6	3.5		67.5	68.3	-0.8	-1.6
Percentage of Parents Who Read to Child Daily***	59.2	54.8	4.5	8.9		55.3	49.3	6.0*	12.0

TABLE E.VII.6 (*continued*)

	Female					Male			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Percentage of Parents Who Read to Child at Bedtime***	34.8	30.9	3.9	8.7		30.0	27.3	2.7	6.0
Parenting Behavior: Negative Parenting Behavior									
Detachment During Parent-Child Semistructured Play	1.2	1.3	-0.1	-8.7		1.2	1.3	-0.1	-8.0
Intrusiveness During Parent-Child Semistructured Play	1.6	1.6	0.0	2.8		1.6	1.7	-0.1	-11.2
Detachment During Parent-Child Puzzle Challenge Task	1.6	1.6	0.1	6.6		1.7	1.7	-0.0	-3.6
Intrusiveness During Parent-Child Puzzle Challenge Task	2.6	2.7	-0.1	-5.6		2.7	2.8	-0.1	-8.1
Negative Regard During Parent-Child Semistructured Play	1.3	1.3	0.0	6.9		1.3	1.3	-0.1	-8.2
HOME Harshness	0.2	0.2	-0.0	-2.3		0.3	0.3	0.0	6.3
Percentage of Parents Who Spanked Child in the Past Week***	43.4	52.1	-8.8**	-17.5		49.5	54.8	-5.4	-10.7
Knowledge of Safety Practices and Discipline Strategies									
Percentage of Parents Who Usually Use a Car Seat Correctly***	71.2	70.4	0.8	1.7		69.0	71.6	-2.6	-5.6
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	46.1	52.4	-6.3**	-12.6		46.1	49.4	-3.3	-6.6
Percentage of Parents Who Would Use Mild Discipline Only***	44.9	38.6	6.3*	12.8		44.4	42.3	2.1	4.3
Index of Severity of Discipline Strategies	3.3	3.6	-0.3**	-15.3		3.4	3.5	-0.1	-6.4
Parent Physical and Mental Health									
Parent's Health Status*	3.4	3.5	-0.1*	-13.7		3.5	3.5	0.0	3.4
Parenting Stress Index (PSI) Parental Distress	24.5	24.9	-0.4	-4.1		24.8	25.8	-0.9	-9.8
PSI Parent-Child Dysfunctional Interaction	17.4	17.2	0.2	2.6		18.1	18.2	-0.1	-0.9
Center for Epidemiological Studies Depression (CES-D; Short Form)	7.3	7.6	-0.3	-3.6		7.4	7.6	-0.2	-2.2
CES-D Severe Depressive Symptoms ***	14.8	15.0	0.2	-0.5		14.3	14.2	0.2	0.4
Family Environment Scale (FES): Family Conflict	1.6	1.7	-0.1	-9.2		1.7	1.7	0.0	1.5
Father Presence									
Currently Married To Biological Father ***	36.6	37.2	-0.6	-1.2		33.1	35.2	-2.0	-4.2
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	48.4	51.9	-3.5	-7.1		49.4	49.5	-0.2	-0.4
Biological Father Currently Present in Child's Life***	73.3	69.9	3.3	7.5		72.5	71.3	1.2	2.7
Continuous Biological Father Presence Child Age 14-36 Months***	68.0	66.0	2.0	4.4		66.7	69.4	-2.7	-5.9
No Biological Father Presence Child Age 14-36 Months***	12.2	14.8	-2.6	-8.4		12.6	10.0	2.6	8.2
Continuous Male Presence Child Age 14-36 Months***	80.7	82.4	-1.8	-4.9		78.4	82.8	-4.3	-12.1
No Male Presence Child Age 14-36 Months***	2.8	1.9	0.9	7.7		2.0	1.8	0.2	2.0

TABLE E.VII.6 (*continued*)

	Female					Male			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Sample Size									
Bayley	**444**	**399**	**843**			**435**	**380**	**815**	
Parent Interview	**542**	**500**	**1,042**			**565**	**502**	**1,067**	
Parent-Child Interactions	**431**	**394**	**825**			**443**	**390**	**833**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.7

IMPACTS ON SELF-SUFFICIENCY AT 28 MONTHS, BY FOCUS CHILD'S GENDER

	Female					Male			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Education/Job Training									
Ever in Education or Training***[d]	61.2	53.0	8.2**	16.3		59.4	50.0	9.4***	18.7
Ever in High School***	12.1	8.5	3.6*	12.6		15.0	10.1	4.9***	17.2
Ever in ESL Class***	4.2	2.6	1.5	10.7		3.2	2.3	0.9	6.2
Ever in Vocational Program***	19.2	16.6	2.6	6.9		20.5	16.7	3.9	10.3
Average Hours per Week in Education or Training	4.3	3.4	0.9**	14.7		5.0	3.4	1.6***	25.5
In Education or Training:									
1st Quarter***	24.4	23.1	1.3	3.1		20.9	21.7	-0.8	-1.9
2nd Quarter***	29.3	25.5	3.8	8.9		26.1	24.7	1.3	3.1
3rd Quarter***	33.3	28.1	5.2*	11.8		30.8	25.0	5.8**	13.2
4th Quarter***	30.4	27.4	3.0	7.0		31.9	22.1	9.8***	22.9
5th Quarter***	29.6	28.4	1.1	2.7		32.3	21.7	10.6***	24.7
6th Quarter***	27.6	24.5	3.1	7.4		32.3	21.1	11.1***	26.8
7th Quarter***	25.4	21.9	3.5	8.6		27.5	21.1	6.4**	15.9
8th Quarter***	24.7	19.8	4.9	12.4		28.5	20.3	8.3***	21.0
Have High School Diploma***	52.7	48.8	3.9	7.8		48.0	49.4	-1.4	-2.8
Have GED***	10.0	11.5	-1.6	-4.9		10.3	10.5	-0.1	-0.4
Employment									
Ever Employed***	87.5	82.3	5.2**	13.9		88.3	84.1	2.2	5.8
Average Hours/Week Employed	18.4	16.9	1.5	10.5		16.2	16.9	-0.8	-5.2
Employed in:									
1st Quarter***	39.3	36.5	2.8	5.7		39.4	40.3	-0.9	-1.9
2nd Quarter***	48.4	44.1	4.3	8.7		43.8	45.9	-2.1	-4.2
3rd Quarter***	56.7	51.7	5.2	10.4		50.0	51.3	-1.3	-2.6
4th Quarter***	58.2	55.1	3.1	6.3		56.0	54.3	1.7	3.4
5th Quarter***	65.1	58.1	7.0**	14.3		58.7	60.8	-2.1	-4.3
6th Quarter***	68.5	59.7	8.7**	17.7		59.9	58.0	1.9	3.8
7th Quarter***	63.7	57.6	6.1*	12.2		57.0	56.1	0.9	1.8
8th Quarter***	66.1	62.6	3.5	7.2		60.8	58.9	1.8	3.8
Any Self-Sufficiency-Oriented Activity (Education, Training, or Employment)									
Ever Employed or in Education/Training***	94.3	89.7	4.6**	15.2		93.5	91.1	2.4	8.0
Average Hours per Week in Any Activity	23.2	20.4	2.8**	17.6		21.8	20.7	1.1	7.2
In Activities in:									
1st Quarter***	54.5	50.4	4.2	8.3		53.6	53.4	0.2	0.5
2nd Quarter***	65.9	57.4	8.5***	17.2		60.4	58.9	1.5	3.0
3rd Quarter***	74.7	65.8	8.9***	18.8		67.4	64.6	2.8	5.9
4th Quarter***	74.3	67.5	6.8**	14.2		71.2	63.7	7.5***	15.6
5th Quarter***	77.8	69.9	7.9***	17.1		72.2	69.5	2.7	5.8
6th Quarter***	80.0	69.7	10.3***	21.9		74.3	66.0	8.3***	17.7
7th Quarter***	75.6	66.1	9.4***	19.7		68.3	64.6	3.7	7.8
8th Quarter***	75.9	69.6	6.3*	13.6		72.4	67.5	4.9	10.4

TABLE E.VII.7 (*continued*)

	Female					Male			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
AFDC/TANF Receipt									
Ever Received AFDC/TANF***	46.2	44.8	1.3	2.7		47.7	44.9	2.8	5.7
Received AFDC/TANF in:									
1st Quarter***	33.1	30.1	3.1	6.6		34.5	31.4	3.2	6.8
2nd Quarter***	34.7	33.2	1.5	3.2		34.3	33.0	1.3	2.8
3rd Quarter***	35.1	34.4	0.7	1.5		37.9	34.6	3.3	6.9
4th Quarter***	27.7	31.1	-3.4	-7.4		32.7	28.9	3.8	8.2
5th Quarter***	27.9	30.2	-2.4	-5.2		31.4	28.2	3.1	6.8
6th Quarter***	24.8	30.5	-5.7***	-12.3		32.6	28.9	3.7	8.0
7th Quarter***	18.9	26.0	-7.1**	-16.2		25.9	25.0	0.9	2.0
8th Quarter***	19.2	23.2	-4.0	-9.4		24.6	22.3	2.3	5.4
Total AFDC/TANF Benefits ($)*	$1,894	$2,121	-$237	-6.1		$2,378	$2,170	$209	5.4
Receipt of Other Welfare Benefits									
Ever Received Welfare***	66.4	68.0	-1.6	-3.5		69.2	65.4	3.9*	8.2
Total Welfare Benefits ($)*	$4,893	$5,243	-$350	-4.6		$5,694	$5,720	-$26	-0.3
Ever Received Food Stamps***	59.7	59.7	0.0	0.1		61.0	59.3	1.8	3.6
Total Food Stamp Benefits ($)	$2,069	$1,966	$104	3.8		$2,130	$2,214	-$84	-3.1`
Income/Poverty									
Income Above Poverty Level***	47.0	45.9	1.1	2.2		39.5	41.1	-1.6	-3.3
Subsequent Births									
Subsequent Birth by 24 Months after Random Assignment***	23.7	28.4	-4.7	-10.5		22.8	28.0	-5.3	-11.7
Sample Size	**530**	**503**	**1,033**			**545**	**508**	**1,053**	

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.8

IMPACTS ON SERVICE RECEIPT DURING THE FIRST 28 MONTHS, BY LABOR FORCE STATUS AT ENROLLMENT

	Employed				In School or Training				Neither Employed nor in School/Training		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Any Services											
Any Key Services***[a,b]	99.2	87.0	12.2***		94.1	78.4	15.7***		96.8	80.1	16.7***
Any Home Visits Or Center-Based Child Care***	99.3	63.8	35.5***		89.7	56.2	33.5***		91.6	53.2	38.4***
More Than 1 Home Visit or 2 Weeks Center-Based Child Care***	97.4	59.1	38.3***		89.9	44.3	45.7***		90.9	46.7	44.2***
Home Visits or Center Care at Required Intensity in at Least 1 Followup***	77.7	13.9	63.8***		71.2	12.9	58.3***		78.7	12.6	66.1***
Home Visits or Center Care at Required Intensity in All 3 Followups***	37.0	9.6	27.4***		20.3	2.5	17.8***		35.0	1.8	33.2***
Home Visits											
Any Home Visits***	94.1	37.1	57.0***		80.2	33.2	47.0***		86.3	33.3	53.0***
Any Child Development Services During Home Visits***	93.3	34.1	59.2***		79.7	31.8	47.9***		85.1	29.7	55.4***
Weekly Home Visits, 1st Follow-Up Period***	45.4	4.9	40.6***		43.9	2.4	41.5***		47.9	3.3	44.5***
Weekly Home Visits, 2nd Follow-Up Period***	35.5	1.8	33.7***		27.7	1.2	26.5***		39.9	3.0	36.9***
Weekly Home Visits, 3rd Follow-Up Period***	32.1	2.5	29.6***		22.9	4.1	18.8***		32.3	2.7	29.6***
Weekly Home Visits in At Least 1 Followup***	60.9	3.8	57.0***		54.3	4.6	49.7***		59.9	5.2	54.7***
Weekly Home Visits in All 3 Followups***	25.5	0.9	24.7***		13.3	0.7	12.6***		22.0	1.3	20.7***
Child Care											
Any Child Care***	95.4	93.0	2.3		93.7	89.3	4.4		79.7	71.5	8.2***
Any Center-Based Child Care***	50.3	39.1	11.2**		56.0	31.2	24.8***		47.0	30.3	16.7***
Average Hours Per Week of Center-Based Care	8.5	5.6	2.9*		5.8	2.4	3.4***		6.0	2.3	3.8***
Concurrent Child Care Arrangements***	60.8	61.9	-1.1		61.8	55.7	6.1		43.3	37.4	5.9*
Average Weekly Out-of-Pocket Cost of Care***	$4.84	$12.45	-$7.61***		$4.61	$3.75	$0.86		$3.74	$6.48	-$2.73***
Received a Child Care Subsidy***	24.7	41.2	-16.5*		47.8	38.9	8.9		27.8	30.0	-2.2
Child Was in Care at 12 Months of Age***	82.3	81.8	0.5		82.4	73.8	8.6		50.4	42.1	8.3**
Child Was in Care at 24 Months of Age***	74.7	74.2	0.5		72.4	67.5	4.9		51.3	41.2	10.1**
Case Management											
Any Case Management Meetings***	92.0	60.0	32.0***		83.1	57.8	25.4***		87.5	56.4	31.1***
Weekly Case Management, 1st Follow-Up Period***	57.0	13.9	43.1***		50.7	5.7	45.0***		48.9	9.0	39.8***
Weekly Case Management, 2nd Follow-Up Period***	41.6	4.2	37.5***		25.9	2.0	23.9***		38.0	6.8	31.2***
Weekly Case Management, 3rd Follow-Up Period***	36.6	3.2	33.4***		19.6	4.2	15.5***		29.6	5.7	23.9***

TABLE E.VII.8 (*continued*)

	Employed				In School or Training				Neither Employed nor in School/Training		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Group Activities											
Any Group Parenting Activities***	71.1	35.4	35.6***		64.7	43.4	21.3***		73.4	35.1	38.3***
Any Parent-Child Group Activities***	43.2	17.8	25.4***		36.5	15.5	21.0***		44.2	14.8	29.3***
Early Intervention Services											
Identification of Child's Disability***	11.8	9.0	2.7		2.8	4.9	-2.1		9.0	6.2	2.8*
Services for Child With Disability***	9.9	7.1	2.8		1.4	2.1	-0.7		5.6	3.6	1.9
Child Health Services											
Any Child Health Services***	100.0	100.0	0.0		99.9	99.8	0.1		100.0	99.9	0.1
Any Doctor Visits***	98.4	98.5	-0.1		99.6	98.4	1.2		99.1	98.6	0.6
Any Emergency Room Visits***	48.0	53.0	-5.0		60.6	57.0	3.6		55.9	53.4	2.5
Number of Emergency Room Visits for Injuries	0.2	0.4	-0.2*		0.3	0.4	-0.1		0.2	0.2	0.0
Any Dentist Visits***	28.7	26.8	1.8		23.9	28.6	-4.7		30.0	26.7	3.3
Any Screening Tests***	63.8	68.1	-4.2		66.1	71.1	-5.1		68.3	65.3	3.0
Any Immunizations***	99.4	97.8	1.6		98.4	97.9	0.5		99.0	97.7	1.3
Family Development Services											
Any Education-Related Services***	86.5	48.5	38.0***		93.1	84.3	8.8**		84.7	52.0	32.7***
Any Employment-Related Services***	74.8	37.8	36.9***		76.1	55.6	20.5***		79.4	47.3	32.1***
Any Family Health Services[c]	100.0	100.0	0.0		100.0	100.0	0.0		100.0	100.0	0.0
Any Family Mental Health Services***	23.7	23.5	0.2		18.0	16.6	1.4		25.2	23.0	2.2
Transportation Assistance***	25.9	16.4	9.6**		29.0	35.0	-6.1		35.2	21.2	14.0***
Housing Assistance***	51.3	47.7	3.6		58.2	63.7	-5.5		63.3	56.8	6.4**
Sample Size	**253**	**226**	**479**		**231**	**205**	**436**		**557**	**544**	**1,101**

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroups are included in the estimates for each subgroup.

[a] Home visits, case management, center-based child care, and/or group parenting activities.

[b] Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups in the first two columns. The third column is a subset of the second column and is included to aid interpretation of subgroup differences.

[c] There is no variance across subgroups due to lack of variance in level of services.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.9

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY LABOR FORCE STATUS AT ENROLLMENT

	Employed					In School or Training					Neither Employed nor in School/Training			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development														
Bayley Mental Development Index (MDI) Standard Score	93.5	91.6	1.9	14.4		90.7	89.6	1.1	8.3		92.0	90.0	2.0**	15.8
Percentage with MDI < 85***[d]	21.6	27.5	-5.9	-12.7		24.2	35.9	-11.7	-25.1		26.3	32.1	-5.8	-12.5
Peabody Picture Vocabulary Test (PPVT)-III Standard Score	86.6	83.1	3.5	21.3		82.3	78.8	3.4	21.0		82.7	81.6	1.2	7.2
Percentage with PPVT-III < 85***	44.7	48.3	-3.6	-7.2		54.4	64.6	-10.2	-20.5		49.5	57.8	-8.3*	-16.6
Child Social-Emotional Development														
Engagement of Parent During Parent-Child Semistructured Play*	4.8	4.6	0.3*	25.3		4.9	4.4	0.5**	44.2		4.7	4.7	0.0	3.1
Sustained Attention with Objects During Parent-Child Semistructured Play**	5.1	4.7	0.4***	38.8		5.1	4.6	0.5***	50.0		4.9	4.9	-0.0	-1.3
Engagement of Parent During Parent-Child Puzzle Challenge Task	5.0	5.0	0.0	1.1		5.1	4.7	0.4*	37.5		5.0	5.0	0.0	1.6
Persistence During Parent-Child Puzzle Challenge Task	4.6	4.5	0.1	8.4		4.7	4.2	0.5**	44.1		4.5	4.5	-0.0	-2.0
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	4.1	4.0	0.1	8.3		4.1	4.1	0.1	11.1		4.0	4.0	-0.0	-2.6
Bayley BRS: Orientation/ Engagement	3.8	3.8	-0.1	-7.1		4.0	3.8	0.1	15.9		3.9	3.8	0.1	7.8
Negativity Toward Parent During Parent-Child Semistructured Play	1.2	1.3	-0.1*	-23.6		1.2	1.3	-0.1	-17.0		1.3	1.3	-0.1	-8.3
Frustration During Parent-Child Puzzle Challenge Task**	2.7	2.9	-0.2	-17.4		2.2	2.8	-0.7**	-50.4		2.8	2.7	0.1	5.2

TABLE E.VII.9 (*continued*)

Outcome	Employed				In School or Training				Neither Employed nor in School/Training			
	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Behavior Checklist—Aggressive Behavior	11.1	11.1	-0.0	-0.6	9.9	11.0	-1.1	-16.9	11.1	11.6	-0.6	-8.5
Child Health Status												
Child's Health Status	4.1	4.1	0.0	1.7	4.0	4.1	-0.1	-7.5	4.0	4.0	-0.1	-5.5
Percentage of Children in Fair or Poor Health***	5.5	10.1	-4.6	-16.2	8.6	4.9	3.7	13.0	9.7	7.7	2.0	7.2
Quality of the Home Environment and Parenting: Overall and Physical Environment												
Home Observation for Measurement of the Environment (HOME) Total Score	27.7	27.1	0.7	13.4	26.5	26.4	0.2	3.9	27.7	27.0	0.7**	13.9
HOME Internal Physical Environment	7.8	7.9	-0.1	-8.0	7.6	7.6	-0.0	-1.9	7.9	7.8	0.1	5.4
Parenting Behavior: Emotional Support												
HOME Warmth	2.7	2.6	0.1	14.6	2.4	2.3	0.1	5.5	2.6	2.5	0.1*	12.8
Supportiveness During Parent-Child Semistructured Play	4.1	4.0	0.2	16.1	3.9	3.7	0.3	28.6	4.0	3.9	0.1	5.0
Supportive Presence During Parent-Child Puzzle Challenge Task	4.8	4.8	-0.0	-0.8	4.1	4.1	-0.0	-0.2	4.5	4.4	0.1	7.8
Parenting Behavior: Stimulation of Language and Learning												
Percentage of Children with a Regular Bedtime***	61.5	54.9	6.6	13.4	53.0	33.6	-0.6	-1.2	62.2	61.6	0.6	1.2
Percentage of Children Who Follow a Bedtime Routine***	77.2	67.9	9.3*	20.0	67.3	61.7	3.6	7.7	69.0	70.0	-1.0	-2.1
HOME: Support of Language and Learning	10.7	10.4	0.3	13.5	10.4	10.2	0.2	7.0	10.6	10.3	0.3**	14.0
Parent-Child Play	4.3	4.4	-0.1	-9.7	4.6	4.4	0.1	17.0	24.4	4.4	0.1	11.9
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.8	3.7	0.1	9.3	3.6	3.3	0.3	26.9	3.6	3.5	0.1	8.7

TABLE E.VII.9 (*continued*)

Outcome	Employed				In School or Training				Neither Employed nor in School/Training			
	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Percentage of Parents Who Read to Child Daily***	57.3	53.5	3.8	7.6	57.5	55.8	1.7	3.4	58.8	50.0	8.7**	17.5
Percentage of Parents Who Read to Child at Bedtime***	41.0	31.5	9.6*	21.0	26.5	39.8	-13.3*	-29.3	33.0	27.1	5.8*	12.9
Parenting Behavior: Negative Parenting Behavior												
Detachment During Parent-Child Semistructured Play	1.2	1.2	-0.0	-1.8	1.5	1.4	0.1	15.5	1.2	1.2	-0.1	-8.3
Intrusiveness During Parent-Child Semistructured Play*	1.3	1.5	-0.2**	-26.4	1.8	1.7	0.1	6.1	1.5	1.5	0.0	5.2
Detachment During Parent-Child Puzzle Challenge Task	1.4	1.6	-0.2	-18.7	2.0	1.7	0.3	28.1	1.7	1.6	-0.1	9.8
Intrusiveness During Parent-Child Puzzle Challenge Task	2.4	2.7	-0.3**	-26.1	3.0	3.1	-0.1	-9.3	2.7	2.7	0.1	4.4
Negative Regard During Parent-Child Semistructured Play**	1.1	1.3	-0.2***	-32.1	1.4	1.4	0.1	12.9	1.3	1.2	0.0	6.8
HOME Harshness	0.3	0.3	-0.1	-2.2	0.4	0.3	0.1	10.9	0.3	0.2	0.0	7.1
Percentage of Parents Who Spanked Child in the Past Week***	43.6	53.6	-10.1*	-20.2	51.8	63.7	-12.0	-24.0	45.3	50.3	-5.0	-10.1
Knowledge of Safety Practices and Discipline Strategies												
Percentage of Parents Who Usually Use a Car Seat Correctly***	77.4	74.2	3.2	7.0	60.2	73.0	-12.8*	-27.8	73.0	71.1	1.9	4.1
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	38.5	46.1	-7.6	-15.1	59.9	60.5	-0.6	-1.2	41.7	48.7	-7.1**	-14.1
Percentage of Parents Who Would Use Mild Discipline Only***	53.5	48.4	5.1	10.4	31.7	32.7	-1.0	-2.0	49.1	42.7	6.3*	12.9

TABLE E.VII.9 (*continued*)

	Employed					In School or Training					Neither Employed nor in School/Training			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Index of Severity of Discipline Strategies	3.1	3.3	-0.2	-11.4		3.9	3.8	0.1	4.5		3.2	3.5	-0.3***	-17.7
Parent Physical and Mental Health														
Parent's Health Status	3.6	3.4	0.2	15.6		3.6	3.6	-0.0	-1.8		3.3	3.4	-0.1	-8.6
Parenting Stress Index (PSI) Parental Distress	24.9	23.8	1.2	12.2		23.6	25.5	-1.9	-19.8		25.0	25.8	-0.8	-8.2
PSI Parent-Child Dysfunctional Interaction	17.6	16.9	0.7	11.0		17.5	18.6	-1.2	-19.1		18.0	17.8	0.2	3.4
Center for Epidemiological Studies Depression (CES-D; Short Form)	7.2	8.0	-0.9	-12.6		7.9	7.7	0.2	2.8		7.8	7.9	-0.1	-1.6
CES-D Severe Depressive Symptoms ***	13.6	17.6	-4.0	-11.2		17.7	11.4	6.4	17.6		16.4	16.8	-0.3	-0.9
Family Environment Scale (FES): Family Conflict	1.7	1.7	-0.1	-10.4		1.6	1.7	-0.1	-9.0		1.6	1.7	-0.0	-6.9
Father Presence														
Currently Married To Biological Father ***	45.1	39.2	5.9	12.1		14.9	18.6	-3.7	-7.7		41.3	44.1	-2.8	-5.7
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	58.2	51.9	6.3	12.7		36.2	36.4	-0.2	-0.4		55.7	57.2	-1.6	-3.1
Biological Father Currently Present in Child's Life***	75.9	68.9	7.0	15.6		63.5	62.5	1.1	2.3		76.8	74.0	2.8	6.1
Continuous Biological Father Presence Child Age 14-36 Months***	64.9	64.3	0.6	1.2		51.1	61.3	-10.3	-22.3		74.3	74.4	-0.1	-0.2
No Biological Father Presence Child Age 14-36 Months***	13.7	15.8	-2.1	-6.7		15.7	13.3	2.5	7.9		9.2	8.6	0.6	1.8
Continuous Male Presence Child Age 14-36 Months***	81.9	89.4	-7.6	-21.1		75.4	78.3	-2.8	-7.9		82.3	84.5	-2.2	-6.2

TABLE E.VII.9 (*continued*)

	Employed					In School or Training					Neither Employed nor in School/Training			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
No Male Presence Child Age 14-36 Months***	4.5	1.9	2.7	22.3		1.9	1.8	0.1	0.9		0.7	1.4	-0.8	-6.4
Sample Size														
Bayley	**226**	**178**	**404**			**194**	**158**	**352**			**425**	**413**	**838**	
Parent Interview	**270**	**230**	**500**			**234**	**201**	**435**			**567**	**535**	**1,102**	
Parent-Child Interactions	**224**	**188**	**412**			**193**	**154**	**347**			**427**	**411**	**838**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.10

IMPACTS ON SELF-SUFFICIENCY AT 28 MONTHS, BY LABOR FORCE STATUS AT ENROLLMENT

	Employed					In School or Training					Neither Employed nor in School/Training			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Education/Job Training														
Ever in Education or Training***[d]	52.4	41.5	10.8*	21.6		82.7	78.2	4.5	9.1		53.8	43.5	10.3***	20.6
Ever in High School***	4.1	1.7	2.4	8.3		38.8	26.3	12.5**	43.9		3.4	2.6	0.7	2.6
Ever in ESL Class***	4.5	1.6	2.9	20.0		-0.1	0.7	-0.9	-5.9		3.8	3.4	0.4	3.0
Ever in Vocational Program***	17.2	13.9	3.4	8.9		25.6	20.7	4.9	13.0		18.7	16.9	1.7	4.6
Average Hours per Week in Education or Training	2.6	1.8	0.8	12.9		9.9	7.6	2.3*	36.4		2.7	2.0	0.7*	10.3
In Education or Training:														
1st Quarter***	14.4	20.0	-5.6*	-13.6		55.1	54.1	1.0	2.4		13.1	13.0	0.2	0.4
2nd Quarter***	17.3	20.1	-2.9	-6.6		56.7	54.9	1.8	4.2		17.5	15.9	1.6	3.7
3rd Quarter***	21.2	19.2	2.0	4.4		62.9	51.8	11.1*	25.2		22.0	17.8	4.2	9.4
4th Quarter***	23.1	20.7	2.4	5.6		58.0	44.8	13.2**	30.8		23.7	17.5	6.2**	14.4
5th Quarter***	24.5	18.8	5.7	13.3		54.1	47.6	6.6	15.2		24.1	17.7	6.3**	14.7
6th Quarter***	23.5	16.8	6.8	16.3		56.5	44.6	12.0*	28.8		23.0	16.7	6.2**	15.0
7th Quarter***	21.1	15.9	5.3	13.1		42.8	32.7	10.1	25.2		18.0	16.9	1.1	2.7
8th Quarter***	23.0	12.3	10.7**	27.3		39.7	33.1	6.6	16.8		19.7	15.3	4.4	11.1
Have High School Diploma***	62.5	60.0	2.6	5.1		47.5	44.5	3.0	6.0		47.5	48.7	-1.2	-2.3
Have GED***	8.1	11.3	-3.2	-10.1		13.6	12.8	0.9	2.7		11.7	12.6	-0.9	-2.8
Employment														
Ever Employed***	95.4	96.7	-1.3	-3.5		84.9	87.9	-2.9	-7.8		83.8	77.4	6.4**	17.1
Average Hours/Week Employed	28.3	27.4	1.0	6.6		11.9	13.8	-1.9	-12.7		14.3	14.0	0.3	2.1
Employed in:														
1st Quarter***	77.1	71.6	5.5	11.4		26.8	31.8	-5.0	-10.4		28.9	29.4	-0.5	-1.0
2nd Quarter***	79.4	71.1	8.3**	16.7		38.2	38.0	0.2	0.4		35.9	39.7	-3.8	-7.7
3rd Quarter***	83.1	78.8	4.4	8.7		47.0	51.2	-4.3	-8.5		44.5	42.3	2.2	4.5
4th Quarter***	81.3	81.3	0.0	0.0		53.6	54.6	-1.0	-2.0		48.6	46.8	1.8	3.7
5th Quarter***	84.1	84.1	0.0	0.0		57.6	61.2	-3.6	-7.3		54.1	52.6	1.6	3.2
6th Quarter***	82.2	77.1	5.1	10.3		53.5	61.7	-8.2	-16.6		57.7	52.9	4.8	9.6
7th Quarter***	76.5	76.8	-0.3	-0.6		49.2	56.2	-7.1	-14.3		54.3	49.8	4.5	9.2
8th Quarter***	75.6	79.1	-3.5	-7.1		52.0	61.9	-9.9	-20.2		60.0	54.8	5.2	10.7
Any Self-Sufficiency-Oriented Activity (Education, Training or Employment)														
Ever Employed or in Education/Training***	96.5	97.8	-1.3	-4.1		98.5	96.4	2.1	7.0		90.6	86.1	4.5*	14.7
Average Hours per Week in Any Activity	30.8	28.8	2.0	12.5		23.4	22.2	1.2	7.4		17.1	16.3	0.8	4.9
1st Quarter***	79.7	75.8	4.0	7.9		67.4	68.1	-0.7	-1.4		37.4	39.3	-1.8	-3.7
2nd Quarter***	82.2	74.4	7.8**	15.7		77.4	73.1	4.3	8.7		47.8	50.0	-2.0	-4.0

TABLE E.VII.10 (*continued*)

	Employed				In School or Training				Neither Employed nor in School/Training			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
3rd Quarter***	87.3	83.1	4.2	8.8	83.0	79.5	3.6	7.5	58.0	53.5	4.6	9.6
4th Quarter***	87.2	85.1	2.2	4.5	83.9	78.8	5.2	10.8	62.1	55.0	7.1**	14.9
5th Quarter***	87.4	86.7	0.7	1.6	85.6	82.0	3.6	7.8	65.3	60.4	4.9	10.6
6th Quarter***	83.8	78.3	5.5	11.7	83.6	80.3	3.3	7.1	68.9	60.0	8.9**	19.0
7th Quarter***	79.5	79.4	0.1	0.3	72.3	73.3	-1.0	-2.1	64.3	57.7	6.6*	13.8
8th Quarter***	79.1	81.2	-2.1	-4.5	72.8	77.1	-4.2	-9.1	69.9	61.6	8.3**	17.8
AFDC/TANF Receipt												
Ever Received AFDC/TANF***	31.6	32.2	-0.6	-1.2	51.0	54.7	-3.7	-7.5	51.7	46.3	5.4**	10.8
Received AFDC/TANF in:												
1st Quarter***	16.7	17.1	-0.4	-0.9	37.3	31.0	6.3	13.5	40.3	36.7	3.6	7.8
2nd Quarter***	18.0	20.8	-2.8	-5.9	37.2	35.6	1.6	3.3	40.0	38.2	1.7	3.7
3rd Quarter***	22.7	22.9	-0.3	-0.6	40.1	40.5	-0.4	-0.9	41.9	37.4	4.6*	9.5
4th Quarter***	18.2	21.9	-3.8	-8.1	33.2	38.2	-5.0	-10.8	35.9	32.3	3.6	7.8
5th Quarter***	14.0	20.8	-6.8**	-14.8	35.7	33.9	1.7	3.8	35.0	31.4	3.7	8.0
6th Quarter***	12.3	18.2	-5.8	-12.6	28.9	35.9	-7.0	-15.2	35.8	31.8	4.0	8.8
7th Quarter***	10.7	14.7	-4.0	-9.1	27.3	35.6	-8.3	-18.8	27.6	26.8	0.9	2.0
8th Quarter***	9.6	10.5	-0.9	-2.1	27.5	35.0	-7.5	-17.7	27.8	24.0	3.8	8.9
Total AFDC/TANF Benefits ($)*	$583	$533	$50	1.3	$1,815	$2,064	-$248	-6.4	$2,852	$2,563	$290	7.5
Receipt of Other Welfare Benefits												
Ever Received Welfare***	59.6	57.2	2.4	5.1	68.6	75.1	-6.5	-13.9	72.2	67.6	4.6*	9.9
Total Welfare Benefits ($)*	$2,332	$3,263	-$931	-12.3	$4,674	$3,405	$1,270	16.8	$6,870	$6,624	$246	3.3
Ever Received Food Stamps***	52.8	53.9	-1.1	-2.2	57.3	63.6	-6.3	-12.9	64.8	62.4	2.4	4.8
Total Food Stamp Benefits ($)	$1,038	$1,177	-$139	-5.1	$2,312	$2,425	-$114	-4.2	$2,531	$2,435	$96	3.5
Income/Poverty												
Income Above Poverty Level***	46.7	50.8	-4.1	-8.3	33.3	27.6	5.7	11.5	41.1	44.1	-3.0	-6.0
Subsequent Births												
Subsequent Birth by 24 Months after Random Assignment***	22.0	27.4	-5.4	-12.1	25.7	37.7	-12.0*	-26.8	23.9	31.4	-7.5**	-16.7
Sample Size	**253**	**226**	**479**		**231**	**205**	**436**		**557**	**544**	**1,101**	

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

TABLE E.VII.10 (*continued*)

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.11

IMPACTS ON SERVICE RECEIPT DURING THE FIRST 28 MONTHS, BY HIGHEST GRADE COMPLETED AT ENROLLMENT

	Less than 12th Grade				12th Grade				More than 12th Grade		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Any Services											
Any Key Services***[a,b]	94.9	79.2	15.8***		97.4	83.5	13.8***		97.3	86.0	11.3***
Any Home Visits Or Center-Based Child Care***	91.2	53.0	38.2***		96.6	60.0	36.6***		97.3	62.5	34.8***
More Than 1 Home Visit or 2 Weeks Center-Based Child Care***	89.0	45.1	43.8***		96.0	54.9	41.1***		96.1	57.8	38.4***
Home Visits or Center Care at Required Intensity in at Least 1 Followup***	68.4	12.6	55.7***		78.1	11.7	66.4***		85.6	11.5	74.1***
Home Visits or Center Care at Required Intensity in All 3 Followups***	44.3	4.2	40.1***		35.1	2.1	33.0***		42.1	5.8	36.2***
Home Visits											
Any Home Visits***	86.2	36.8	49.4***		89.9	34.3	55.6***		91.4	30.3	61.1***
Any Child Development Services During Home Visits***	84.3	32.7	51.6***		91.3	32.7	58.6***		90.7	28.4	62.3***
Weekly Home Visits, 1st Follow-Up Period***	45.7	4.6	41.2***		49.4	4.4	45.0***		60.5	0.8	59.7***
Weekly Home Visits, 2nd Follow-Up Period***	33.9	2.1	31.8***		40.6	3.9	36.7***		44.8	1.6	43.2***
Weekly Home Visits, 3rd Follow-Up Period***	26.7	4.1	22.6***		34.8	2.8	32.0***		29.2	0.6	28.6***
Weekly Home Visits in At Least 1 Followup***	59.0	8.3	50.7***		62.8	6.1	56.7***		66.5	1.4	65.1***
Weekly Home Visits in All 3 Followups***	17.3	0.3	17.0***		25.4	0.8	24.6***		26.1	0.3	25.7***
Child Care											
Any Child Care***	84.7	77.5	7.2***		88.6	84.8	3.8		91.2	83.0	8.3**
Any Center-Based Child Care***	47.3	29.1	18.2***		53.4	36.1	17.3***		53.6	42.2	11.4**
Average Hours Per Week of Center-Based Care	5.0	2.1	3.0***		6.1	2.3	3.8***		6.1	4.4	1.6
Concurrent Child Care Arrangements***	50.6	42.2	8.4**		58.2	54.5	3.7		48.7	52.1	-3.4
Average Weekly Out-of-Pocket Cost of Care***	$3.73	$4.86	-$1.13		$5.27	$6.11	-$0.84		$4.43	$14.48	-$10.06***
Received a Child Care Subsidy***	26.7	32.8	-3.1		36.1	38.3	-2.2		33.7	28.1	5.5
Child Was in Care at 12 Months of Age***	63.8	54.1	9.6***		65.3	63.7	1.6		65.9	55.9	10.0*
Child Was in Care at 24 Months of Age***	57.9	51.1	6.8		57.8	51.2	6.6		68.5	67.2	1.3
Case Management											
Any Case Management Meetings***	85.6	56.9	28.7***		92.1	64.5	27.5***		89.8	56.4	33.4***
Weekly Case Management, 1st Follow-Up Period***	43.5	8.8	34.6***		50.0	9.2	40.9***		54.2	9.9	44.4***
Weekly Case Management, 2nd Follow-Up Period***	30.6	4.4	26.1***		43.0	8.4	34.6***		41.4	1.4	40.0***
Weekly Case Management, 3rd Follow-Up Period***	27.8	4.0	23.8***		32.0	9.2	22.8***		35.7	2.9	32.8***

TABLE E.VII.11 (*continued*)

	Less than 12th Grade				12th Grade				More than 12th Grade		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Group Activities											
Any Group Parenting Activities***	67.8	34.3	33.5***		69.8	36.1	33.7***		77.4	43.3	34.1***
Any Parent-Child Group Activities**	36.7	10.9	25.8***		38.6	14.8	23.8***		45.5	20.6	24.9***
Early Intervention Services											
Identification of Child's Disability***	6.2	5.2	1.0		7.9	5.9	2.0		12.0	7.2	4.8*
Services for Child With Disability***	3.72	3.1	0.6		6.1	4.1	2.0		7.3	4.3	2.9
Child Health Services											
Any Child Health Services**	100.0	99.6	0.5		100.0	100.0	0.0		100.0	100.0	0.0
Any Doctor Visits***	98.6	97.7	0.9		100.0	99.7	0.3		99.3	99.6	-0.4
Any Emergency Room Visits***	54.1	55.9	-1.8		59.4	59.2	0.1		56.0	48.2	7.8
Number of Emergency Room Visits for Injuries	0.2	0.4	-0.1**		0.2	0.3	-0.0		0.3	0.3	0.0
Any Dentist Visits***	26.9	24.8	2.1		31.6	21.9	9.7**		31.2	28.2	3.0
Any Screening Tests***	63.4	66.9	-3.6		69.4	63.2	6.2		70.6	67.4	3.1
Any Immunizations***	98.3	97.3	0.9		98.9	98.4	0.5		100.0	98.8	1.2
Family Development Services											
Any Education-Related Services***	91.2	67.1	24.0***		84.4	52.6	31.8***		88.2	57.6	30.6***
Any Employment-Related Services***	75.2	46.5	28.7***		82.3	54.4	28.0***		80.2	47.4	32.8***
Any Family Health Services[c]	100.0	100.0	0.0		100.0	100.0	0.0		100.0	100.0	0.0
Any Family Mental Health Services***	20.4	18.3	2.1		27.0	25.8	1.2		25.3	24.0	1.3
Transportation Assistance***	31.9	24.6	7.3**		37.8	25.4	12.4***		34.8	18.7	16.1***
Housing Assistance***	56.6	57.0	-0.5		63.8	65.8	-2.0		54.1	44.5	9.6**
Sample Size	**475**	**448**	**923**		**292**	**283**	**575**		**269**	**239**	**508**

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroups are included in the estimates for each subgroup.

[a] Home visits, case management, center-based child care, and/or group parenting activities.

[b] Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups in the first two columns. The third column is a subset of the second column and is included to aid interpretation of subgroup differences.

[c] There is no variance across subgroups due to lack of variance in level of services.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.12

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY HIGHEST GRADE COMPLETED AT ENROLLMENT

	Less than 12th Grade					12th Grade					More than 12th Grade			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development														
Bayley Mental Development Index (MDI) Standard Score	89.9	87.8	2.0*	15.6		92.8	90.0	2.8*	21.5		95.3	96.5	-1.2	-9.3
Percentage with MDI < 85***[d]	29.7	37.0	-7.3*	-15.8		23.0	31.6	-8.9	-18.4		20.0	16.5	3.5	7.6
Peabody Picture Vocabulary Test (PPVT)-III Standard Score	80.0	79.4	0.6	3.8		85.9	82.1	3.8**	23.2		93.4	93.7	-0.4	-2.2
Percentage with PPVT-III < 85***	62.9	62.5	0.4	0.8		40.9	53.2	-12.3*	-24.6		24.6	27.0	-2.4	-4.7
Child Social-Emotional Development														
Engagement of Parent During Parent-Child Semistructured Play	4.6	4.5	0.1	11.0		5.0	4.7	0.3**	26.7		5.0	4.9	0.1	9.4
Sustained Attention with Objects During Parent-Child Semistructured Play	4.9	4.7	0.2**	19.8		5.2	4.9	0.2*	22.0		5.2	5.1	0.1	8.3
Engagement of Parent During Parent-Child Puzzle Challenge Task	4.9	4.9	0.0	3.8		5.2	5.0	0.2	17.1		5.2	5.0	0.1	13.7
Persistence During Parent-Child Puzzle Challenge Task	4.4	4.4	-0.0	-0.1		4.8	4.5	0.3**	26.3		5.0	4.8	0.1	9.8
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	3.9	3.9	-0.0	-1.0		3.9	3.9	0.0	5.5		4.1	4.1	-0.0	-1.1
Bayley BRS: Orientation/ Engagement	3.8	3.8	0.0	0.6		3.9	3.9	0.1	6.4		4.1	4.2	-0.1	-13.0
Negativity Toward Parent During Parent-Child Semistructured Play	1.3	1.3	0.0	0.5		1.2	1.4	-0.2***	-33.9		1.2	1.3	-0.1	-11.1
Frustration During Parent-Child Puzzle Challenge Task	2.6	2.6	-0.0	-1.4		2.9	3.0	-0.1	-5.2		2.7	2.9	-0.3	-18.8

TABLE E.VII.12 (*continued*)

Outcome	Less than 12th Grade: Program Group Participants	Less than 12th Grade: Control Group[a]	Less than 12th Grade: Impact Estimate per Participant[b]	Less than 12th Grade: Effect Size[c]	12th Grade: Program Group Participants	12th Grade: Control Group[a]	12th Grade: Impact Estimate per Participant[b]	12th Grade: Effect Size[c]	More than 12th Grade: Program Group Participants	More than 12th Grade: Control Group[a]	More than 12th Grade: Impact Estimate per Participant[b]	More than 12th Grade: Effect Size[c]
Child Behavior Checklist—Aggressive Behavior	10.7	11.4	-0.7	-10.9	11.6	11.4	0.2	2.7	10.1	11.3	-1.2*	-19.3
Child Health Status												
Child's Health Status	4.0	4.0	-0.0	-2.6	4.0	3.9	0.1	9.6	4.1	4.3	-0.2	15.9
Percentage of Children in Fair or Poor Health***	8.9	8.3	0.5	1.9	5.8	10.1	-4.2	-14.9	7.0	2.7	4.3	15.1
Quality of the Home Environment and Parenting: Overall and Physical Environment												
Home Observation for Measurement of the Environment (HOME) Total Score	26.0	25.7	0.3	6.2	28.2	27.9	0.4	7.2	29.8	29.9	-0.1	-2.2
HOME Internal Physical Environment	7.5	7.6	-0.1	-7.7	7.9	7.9	0.0	1.1	8.0	8.2	-0.2	-16.0
Parenting Behavior: Emotional Support												
HOME Warmth	2.4	2.3	0.1	7.4	2.7	2.5	0.1	13.2	2.7	2.8	-0.1	-8.9
Supportiveness During Parent-Child Semistructured Play	3.8	3.7	0.1	9.1	4.2	4.0	0.1	14.6	4.4	4.3	0.1	12.7
Supportive Presence During Parent-Child Puzzle Challenge Task	4.1	4.2	-0.1	-7.1	4.8	4.6	0.2*	18.1	5.1	5.1	-0.1	-3.8
Parenting Behavior: Stimulation of Language and Learning												
Percentage of Children with a Regular Bedtime***	57.4	64.3	2.4	4.9	63.0	57.1	6.0	12.1	64.3	64.3	0.1	0.2
Percentage of Children Who Follow a Bedtime Routine***	67.6	4.3	3.3	7.2	71.4	71.4	-0.0	-0.1	75.9	73.9	2.0	4.3
HOME: Support of Language and Learning**	10.2	10.0	0.3	12.1	10.9	10.7	0.2	10.7	11.3	11.8	-0.5**	-21.4
Parent-Child Play	4.4	4.3	0.1	11.4	4.4	4.3	0.1	7.5	4.5	4.4	0.1	15.1
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.3	3.3	0.0	1.0	3.8	3.5	0.3**	28.6	4.0	4.0	0.0	1.3
Percentage of Parents Who Read to Child Daily***	51.7	47.3	4.5	9.0	60.3	52.7	7.6	15.1	69.2	59.9	9.3*	18.7

TABLE E.VII.12 (*continued*)

	Less than 12th Grade					12th Grade					More than 12th Grade			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Percentage of Parents Who Read to Child at Bedtime***	24.1	23.9	0.2	0.5		34.0	31.7	2.3	5.0		50.6	39.1	11.5**	25.3
Parenting Behavior: Negative Parenting Behavior														
Detachment During Parent-Child Semistructured Play	1.3	1.3	-0.0	-6.4		1.2	1.2	-0.0	-3.5		1.1	1.1	-0.0	-0.4
Intrusiveness During Parent-Child Semistructured Play	1.7	1.7	-0.0	-0.1		1.4	1.5	-0.1	-10.9		1.4	1.4	-0.0	-4.6
Detachment During Parent-Child Puzzle Challenge Task	1.9	1.8	0.1	9.1		1.5	1.6	-0.1	-10.8		1.5	1.5	-0.1	-5.7
Intrusiveness During Parent-Child Puzzle Challenge Task	2.8	2.9	-0.1	-4.3		2.4	2.6	-0.2	-19.1		2.3	2.4	-0.1	-6.0
Negative Regard During Parent-Child Semistructured Play	1.4	1.3	0.0	7.3		1.2	1.3	-0.1	-12.7		1.2	1.2	-0.1	-9.5
HOME Harshness	0.4	0.4	0.0	2.7		0.3	0.2	0.0	5.9		0.3	0.3	-0.0	-4.2
Percentage of Parents Who Spanked Child in the Past Week***	48.2	52.6	-4.4	-8.8		44.3	52.2	-7.9	-15.8		47.1	60.4	-13.3**	-26.7
Knowledge of Safety Practices and Discipline Strategies														
Percentage of Parents Who Usually Use a Car Seat Correctly***	62.6	65.5	-2.9	-6.4		72.1	70.1	2.0	4.5		81.3	79.4	1.9	4.2
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	52.5	55.0	-2.5	-5.0		44.6	49.7	-5.2	-10.3		37.4	44.6	-7.2	-14.4
Percentage of Parents Who Would Use Mild Discipline Only***	40.6	36.9	3.6	7.4		45.3	43.3	2.0	4.1		52.0	49.2	2.7	5.5
Index of Severity of Discipline Strategies	3.6	3.7	-0.1	-6.0		3.3	3.5	-0.2	-9.1		3.1	3.3	-0.2	-12.6
Parent Physical and Mental Health														
Parent's Health Status	3.4	3.4	-0.0	-2.4		3.4	3.5	-0.0	-2.6		3.6	3.6	-0.1	-5.9
Parenting Stress Index (PSI) Parental Distress	25.4	27.1	-1.7**	-17.6		25.5	24.4	1.1	11.4		23.0	23.5	-0.4	-4.5

TABLE E.VII.12 (*continued*)

Outcome	Less than 12th Grade: Program Group Participants	Less than 12th Grade: Control Group[a]	Less than 12th Grade: Impact Estimate per Participant[b]	Less than 12th Grade: Effect Size[c]	12th Grade: Program Group Participants	12th Grade: Control Group[a]	12th Grade: Impact Estimate per Participant[b]	12th Grade: Effect Size[c]	More than 12th Grade: Program Group Participants	More than 12th Grade: Control Group[a]	More than 12th Grade: Impact Estimate per Participant[b]	More than 12th Grade: Effect Size[c]
PSI Parent-Child Dysfunctional Interaction	18.7	19.0	-0.3	-5.1	18.0	17.0	1.1*	17.5	16.8	16.6	0.1	2.0
Center for Epidemiological Studies Depression (CES-D; Short Form)	8.3	8.1	0.3	3.5	7.8	8.6	-0.8	-11.3	7.2	7.5	-0.4	-5.3
CES-D Severe Depressive Symptoms ***	19.9	14.9	5.1	14.1	12.9	19.7	-6.8*	-18.9	12.6	12.6	0.0	0.0
Family Environment Scale (FES): Family Conflict	1.7	1.7	0.0	3.1	1.6	1.7	-0.1	-16.5	1.6	1.7	-0.0	-4.6
Father Presence												
Currently Married To Biological Father ***	29.7	27.4	2.3	4.8	3.9.3	41.0	-1.7	-3.5	38.8	39.4	-0.6	-1.2
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	46.5	45.1	1.4	2.9	54.2	55.0	-0.8	-1.6	48.6	47.1	1.5	3.1
Biological Father Currently Present in Child's Life***	70.6	67.5	3.2	7.0	75.2	74.1	1.1	2.5	74.9	68.8	6.0	13.5
Continuous Biological Father Presence Child Age 14-36 Months***	58.7	61.4	-2.7	-5.9	69.3	74.0	-4.8	-10.4	72.3	72.1	0.1	0.2
No Biological Father Presence Child Age 14-36 Months***	11.9	13.9	-2.0	-6.5	11.3	8.5	2.8	8.8	10.8	14.4	-3.6	-11.3
Continuous Male Presence Child Age 14-36 Months***	77.2	79.1	-1.8	-5.1	82.0	85.3	-3.3	-9.2	87.6	90.7	-3.2	-8.9
No Male Presence Child Age 14-36 Months***	0.8	2.0	-1.3	-10.5	2.8	1.2	1.6	13.4	2.1	2.8	-0.7	-5.8
Sample Size												
Bayley	**394**	**347**	**741**		**237**	**216**	**453**		**212**	**182**	**394**	
Parent Interview	**484**	**438**	**922**		**312**	**280**	**592**		**272**	**244**	**516**	
Parent-Child Interactions	**395**	**347**	**742**		**246**	**211**	**457**		**200**	**192**	**392**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

TABLE E.VII.12 (*continued*)

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.12

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY HIGHEST GRADE COMPLETED AT ENROLLMENT

	Less than 12th Grade					12th Grade					More than 12th Grade			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development														
Bayley Mental Development Index (MDI) Standard Score	89.9	87.8	2.0*	15.6		92.8	90.0	2.8*	21.5		95.3	96.5	-1.2	-9.3
Percentage with MDI < 85***[d]	29.7	37.0	-7.3*	-15.8		23.0	31.6	-8.9	-18.4		20.0	16.5	3.5	7.6
Peabody Picture Vocabulary Test (PPVT)-III Standard Score	80.0	79.4	0.6	3.8		85.9	82.1	3.8**	23.2		93.4	93.7	-0.4	-2.2
Percentage with PPVT-III < 85***	62.9	62.5	0.4	0.8		40.9	53.2	-12.3*	-24.6		24.6	27.0	-2.4	-4.7
Child Social-Emotional Development														
Engagement of Parent During Parent-Child Semistructured Play	4.6	4.5	0.1	11.0		5.0	4.7	0.3**	26.7		5.0	4.9	0.1	9.4
Sustained Attention with Objects During Parent-Child Semistructured Play	4.9	4.7	0.2**	19.8		5.2	4.9	0.2*	22.0		5.2	5.1	0.1	8.3
Engagement of Parent During Parent-Child Puzzle Challenge Task	4.9	4.9	0.0	3.8		5.2	5.0	0.2	17.1		5.2	5.0	0.1	13.7
Persistence During Parent-Child Puzzle Challenge Task	4.4	4.4	-0.0	-0.1		4.8	4.5	0.3**	26.3		5.0	4.8	0.1	9.8
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	3.9	3.9	-0.0	-1.0		3.9	3.9	0.0	5.5		4.1	4.1	-0.0	-1.1
Bayley BRS: Orientation/ Engagement	3.8	3.8	0.0	0.6		3.9	3.9	0.1	6.4		4.1	4.2	-0.1	-13.0
Negativity Toward Parent During Parent-Child Semistructured Play	1.3	1.3	0.0	0.5		1.2	1.4	-0.2***	-33.9		1.2	1.3	-0.1	-11.1
Frustration During Parent-Child Puzzle Challenge Task	2.6	2.6	-0.0	-1.4		2.9	3.0	-0.1	-5.2		2.7	2.9	-0.3	-18.8

TABLE E.VII.12 (*continued*)

Outcome	Less than 12th Grade: Program Group Participants	Less than 12th Grade: Control Group[a]	Less than 12th Grade: Impact Estimate per Participant[b]	Less than 12th Grade: Effect Size[c]	12th Grade: Program Group Participants	12th Grade: Control Group[a]	12th Grade: Impact Estimate per Participant[b]	12th Grade: Effect Size[c]	More than 12th Grade: Program Group Participants	More than 12th Grade: Control Group[a]	More than 12th Grade: Impact Estimate per Participant[b]	More than 12th Grade: Effect Size[c]
Child Behavior Checklist—Aggressive Behavior	10.7	11.4	-0.7	-10.9	11.6	11.4	0.2	2.7	10.1	11.3	-1.2*	-19.3
Child Health Status												
Child's Health Status	4.0	4.0	-0.0	-2.6	4.0	3.9	0.1	9.6	4.1	4.3	-0.2	15.9
Percentage of Children in Fair or Poor Health***	8.9	8.3	0.5	1.9	5.8	10.1	-4.2	-14.9	7.0	2.7	4.3	15.1
Quality of the Home Environment and Parenting: Overall and Physical Environment												
Home Observation for Measurement of the Environment (HOME) Total Score	26.0	25.7	0.3	6.2	28.2	27.9	0.4	7.2	29.8	29.9	-0.1	-2.2
HOME Internal Physical Environment	7.5	7.6	-0.1	-7.7	7.9	7.9	0.0	1.1	8.0	8.2	-0.2	-16.0
Parenting Behavior: Emotional Support												
HOME Warmth	2.4	2.3	0.1	7.4	2.7	2.5	0.1	13.2	2.7	2.8	-0.1	-8.9
Supportiveness During Parent-Child Semistructured Play	3.8	3.7	0.1	9.1	4.2	4.0	0.1	14.6	4.4	4.3	0.1	12.7
Supportive Presence During Parent-Child Puzzle Challenge Task	4.1	4.2	-0.1	-7.1	4.8	4.6	0.2*	18.1	5.1	5.1	-0.1	-3.8
Parenting Behavior: Stimulation of Language and Learning												
Percentage of Children with a Regular Bedtime***	57.4	64.3	2.4	4.9	63.0	57.1	6.0	12.1	64.3	64.3	0.1	0.2
Percentage of Children Who Follow a Bedtime Routine***	67.6	4.3	3.3	7.2	71.4	71.4	-0.0	-0.1	75.9	73.9	2.0	4.3
HOME: Support of Language and Learning**	10.2	10.0	0.3	12.1	10.9	10.7	0.2	10.7	11.3	11.8	-0.5**	-21.4
Parent-Child Play	4.4	4.3	0.1	11.4	4.4	4.3	0.1	7.5	4.5	4.4	0.1	15.1
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.3	3.3	0.0	1.0	3.8	3.5	0.3**	28.6	4.0	4.0	0.0	1.3
Percentage of Parents Who Read to Child Daily***	51.7	47.3	4.5	9.0	60.3	52.7	7.6	15.1	69.2	59.9	9.3*	18.7

TABLE E.VII.12 (*continued*)

	Less than 12th Grade					12th Grade					More than 12th Grade			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Percentage of Parents Who Read to Child at Bedtime***	24.1	23.9	0.2	0.5		34.0	31.7	2.3	5.0		50.6	39.1	11.5**	25.3
Parenting Behavior: Negative Parenting Behavior														
Detachment During Parent-Child Semistructured Play	1.3	1.3	-0.0	-6.4		1.2	1.2	-0.0	-3.5		1.1	1.1	-0.0	-0.4
Intrusiveness During Parent-Child Semistructured Play	1.7	1.7	-0.0	-0.1		1.4	1.5	-0.1	-10.9		1.4	1.4	-0.0	-4.6
Detachment During Parent-Child Puzzle Challenge Task	1.9	1.8	0.1	9.1		1.5	1.6	-0.1	-10.8		1.5	1.5	-0.1	-5.7
Intrusiveness During Parent-Child Puzzle Challenge Task	2.8	2.9	-0.1	-4.3		2.4	2.6	-0.2	-19.1		2.3	2.4	-0.1	-6.0
Negative Regard During Parent-Child Semistructured Play	1.4	1.3	0.0	7.3		1.2	1.3	-0.1	-12.7		1.2	1.2	-0.1	-9.5
HOME Harshness	0.4	0.4	0.0	2.7		0.3	0.2	0.0	5.9		0.3	0.3	-0.0	-4.2
Percentage of Parents Who Spanked Child in the Past Week***	48.2	52.6	-4.4	-8.8		44.3	52.2	-7.9	-15.8		47.1	60.4	-13.3**	-26.7
Knowledge of Safety Practices and Discipline Strategies														
Percentage of Parents Who Usually Use a Car Seat Correctly***	62.6	65.5	-2.9	-6.4		72.1	70.1	2.0	4.5		81.3	79.4	1.9	4.2
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	52.5	55.0	-2.5	-5.0		44.6	49.7	-5.2	-10.3		37.4	44.6	-7.2	-14.4
Percentage of Parents Who Would Use Mild Discipline Only***	40.6	36.9	3.6	7.4		45.3	43.3	2.0	4.1		52.0	49.2	2.7	5.5
Index of Severity of Discipline Strategies	3.6	3.7	-0.1	-6.0		3.3	3.5	-0.2	-9.1		3.1	3.3	-0.2	-12.6
Parent Physical and Mental Health														
Parent's Health Status	3.4	3.4	-0.0	-2.4		3.4	3.5	-0.0	-2.6		3.6	3.6	-0.1	-5.9
Parenting Stress Index (PSI) Parental Distress	25.4	27.1	-1.7**	-17.6		25.5	24.4	1.1	11.4		23.0	23.5	-0.4	-4.5

TABLE E.VII.12 (*continued*)

Outcome	Less than 12th Grade: Program Group Participants	Less than 12th Grade: Control Group[a]	Less than 12th Grade: Impact Estimate per Participant[b]	Less than 12th Grade: Effect Size[c]	12th Grade: Program Group Participants	12th Grade: Control Group[a]	12th Grade: Impact Estimate per Participant[b]	12th Grade: Effect Size[c]	More than 12th Grade: Program Group Participants	More than 12th Grade: Control Group[a]	More than 12th Grade: Impact Estimate per Participant[b]	More than 12th Grade: Effect Size[c]
PSI Parent-Child Dysfunctional Interaction	18.7	19.0	-0.3	-5.1	18.0	17.0	1.1*	17.5	16.8	16.6	0.1	2.0
Center for Epidemiological Studies Depression (CES-D; Short Form)	8.3	8.1	0.3	3.5	7.8	8.6	-0.8	-11.3	7.2	7.5	-0.4	-5.3
CES-D Severe Depressive Symptoms ***	19.9	14.9	5.1	14.1	12.9	19.7	-6.8*	-18.9	12.6	12.6	0.0	0.0
Family Environment Scale (FES): Family Conflict	1.7	1.7	0.0	3.1	1.6	1.7	-0.1	-16.5	1.6	1.7	-0.0	-4.6
Father Presence												
Currently Married To Biological Father ***	29.7	27.4	2.3	4.8	3.9.3	41.0	-1.7	-3.5	38.8	39.4	-0.6	-1.2
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	46.5	45.1	1.4	2.9	54.2	55.0	-0.8	-1.6	48.6	47.1	1.5	3.1
Biological Father Currently Present in Child's Life***	70.6	67.5	3.2	7.0	75.2	74.1	1.1	2.5	74.9	68.8	6.0	13.5
Continuous Biological Father Presence Child Age 14-36 Months***	58.7	61.4	-2.7	-5.9	69.3	74.0	-4.8	-10.4	72.3	72.1	0.1	0.2
No Biological Father Presence Child Age 14-36 Months***	11.9	13.9	-2.0	-6.5	11.3	8.5	2.8	8.8	10.8	14.4	-3.6	-11.3
Continuous Male Presence Child Age 14-36 Months***	77.2	79.1	-1.8	-5.1	82.0	85.3	-3.3	-9.2	87.6	90.7	-3.2	-8.9
No Male Presence Child Age 14-36 Months***	0.8	2.0	-1.3	-10.5	2.8	1.2	1.6	13.4	2.1	2.8	-0.7	-5.8
Sample Size												
Bayley	**394**	**347**	**741**		**237**	**216**	**453**		**212**	**182**	**394**	
Parent Interview	**484**	**438**	**922**		**312**	**280**	**592**		**272**	**244**	**516**	
Parent-Child Interactions	**395**	**347**	**742**		**246**	**211**	**457**		**200**	**192**	**392**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

TABLE E.VII.12 (*continued*)

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.13

IMPACTS ON SELF-SUFFICIENCY AT 28 MONTHS, BY HIGHEST GRADE COMPLETED AT ENROLLMENT

	Less than 12th Grade				12th Grade				More than 12th Grade			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Education/Job Training												
Ever in Education or Training***[d]	68.7	62.2	6.5*	12.9	47.7	39.0	8.7*	17.4	60.8	52.1	8.8*	17.5
Ever in High School***	28.9	22.1	6.7**	23.6	-0.1	0.4	-0.4	-1.4	0.0	0.0	0.0	0.0
Ever in ESL Class***	4.2	3.4	0.8	5.6	4.0	2.4	1.6	11.2	1.3	4.8	-3.5***	-24.5
Ever in Vocational Program***	18.0	18.6	-0.7	-1.8	25.2	15.7	9.4**	25.0	21.6	13.9	7.7*	20.4
Average Hours per Week in Education or Training*	6.7	4.8	2.0***	31.2	2.3	1.4	0.9*	13.8	3.4	3.3	0.1	1.0
In Education or Training:												
1st Quarter***	28.6	26.6	2.1	5.0	10.3	12.3	-2.0	-4.9	23.0	25.9	-2.9	-6.9
2nd Quarter***	33.7	30.6	3.1	7.1	13.4	13.8	-0.4	-1.0	26.7	78.5	-1.8	-4.1
3rd Quarter***	39.8	31.7	8.1**	18.4	20.3	15.2	5.1	11.5	27.0	29.3	-2.3	-5.1
4th Quarter***	39.9	26.7	13.1***	30.5	19.3	15.3	4.0	9.3	28.1	29.6	-1.5	-3.5
5th Quarter***	36.6	28.1	8.5**	19.8	20.7	15.1	5.7	13.1	31.9	27.9	4.0	9.3
6th Quarter***	35.3	28.2	7.2**	17.2	24.4	12.4	12.1***	29.1	26.1	25.0	1.1	2.6
7th Quarter***	29.8	25.1	4.7	11.8	17.2	12.4	4.8	11.9	24.8	25.2	-0.3	-0.9
8th Quarter***	29.0	25.3	3.8	9.6	19.6	11.6	8.0**	20.4	28.2	22.9	5.3	13.4
Have High School Diploma***	18.8	20.7	-1.9	-3.8	76.1	69.6	6.5	13.0	74.9	82.2	-7.2*	-14.5
Have GED***	12.6	12.2	0.4	1.2	14.4	18.1	-3.7	-11.5	5.6	5.5	0.1	0.2
Employment												
Ever Employed***	85.1	82.7	2.4	6.3	90.6	84.8	5.8*	15.6	90.2	87.6	2.6	6.9
Average Hours/Week Employed	13.0	13.8	-0.8	-5.6	21.8	19.5	2.3	15.6	21.4	19.8	1.6	11.1
Employed in:												
1st Quarter***	28.0	31.6	-3.6	-7.5	47.5	49.1	-1.6	-3.3	51.8	41.4	10.4**	21.4
2nd Quarter***	36.0	38.5	-2.6	-5.1	54.4	54.2	0.1	0.3	57.9	49.1	8.8**	17.6
3rd Quarter***	42.6	47.6	-5.0	-10.0	62.4	58.1	4.3	8.6	64.8	58.7	6.2	12.4
4th Quarter***	49.3	48.9	0.4	0.8	64.5	59.6	5.0	10.0	66.1	65.9	0.2	0.5
5th Quarter***	53.9	53.4	0.6	1.2	69.9	64.7	5.3	10.7	70.0	68.7	1.5	2.7
6th Quarter***	58.9	55.1	3.8	7.7	72.6	60.6	12.0**	24.3	72.6	69.2	3.4	6.9
7th Quarter***	55.3	52.4	2.9	5.8	65.8	57.8	8.1*	16.3	68.6	67.4	1.2	2.4
8th Quarter***	59.1	59.1	0.0	0.0	69.0	61.8	7.2	14.8	71.5	69.0	2.5	5.2
Any Self-Sufficiency-Oriented Activity (Education, Training or Employment)												
Ever Employed or in Education/Training***	94.7	91.5	3.2	10.6	94.6	88.4	6.2**	20.5	96.7	93.0	3.7	12.0
Average Hours per Week in Any Activity	20.8	18.8	2.0	12.9	24.3	21.4	2.9*	18.3	25.1	23.7	1.4	8.9

TABLE E.VII.13 (*continued*)

	Less than 12th Grade					12th Grade					More than 12th Grade			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
In Activities in:														
1st Quarter***	48.5	48.9	-0.4	-0.8		54.8	54.7	0.1	0.3		62.6	54.8	7.8*	15.5
2nd Quarter***	58.8	56.7	2.1	4.2		61.9	61.2	0.7	1.5		71.0	59.6	11.4***	23.1
3rd Quarter***	67.0	64.3	2.8	5.8		72.7	67.9	4.9	10.3		78.0	70.7	7.3*	15.4
4th Quarter***	71.0	62.6	8.4**	17.7		74.3	66.8	7.5*	15.8		76.2	73.0	3.2	6.7
5th Quarter***	72.2	66.3	5.9*	12.8		76.8	70.8	6.1	13.1		80.1	76.1	4.0	8.7
6th Quarter***	75.9	66.7	9.2**	19.6		80.3	64.0	16.3***	34.7		81.9	75.4	6.6	13.9
7th Quarter***	70.1	65.2	4.8	10.1		72.3	63.1	9.1**	19.1		79.1	72.9	6.1	12.8
8th Quarter***	73.2	68.7	4.5	9.6		73.8	65.6	8.2*	17.6		81.9	76.6	5.3	11.4
AFDC/TANF Receipt														
Ever Received AFDC/TANF***	55.2	51.4	3.8	7.6		46.2	45.1	1.1	2.2		31.9	32.8	-0.9	-1.8
Received AFDC/TANF in:														
1st Quarter***	40.4	33.4	7.0***	15.0		34.4	32.2	2.2	4.6		22.8	23.4	-0.6	-1.3
2nd Quarter***	40.8	35.9	5.0*	10.5		35.0	36.6	-1.6	-3.3		23.6	24.0	-0.4	-0.9
3rd Quarter***	43.7	38.5	5.2*	10.9		35.6	35.8	-0.2	-0.4		27.0	24.6	2.4	5.0
4th Quarter***	38.0	32.7	5.3*	11.5		27.9	31.6	-3.7	-8.1		21.5	21.5	0.0	-0.1
5th Quarter***	35.8	33.1	2.7	5.9		28.5	31.2	-2.7	-5.9		20.2	20.2	0.0	0.0
6th Quarter***	34.4	35.6	-1.2	-2.6		26.3	30.5	-4.2	-9.0		17.3	18.3	-1.0	-2.3
7th Quarter***	29.9	32.4	-2.4	-5.5		18.6	24.5	-5.9	-13.4		13.1	12.5	0.6	1.4
8th Quarter***	30.3	29.5	0.8	1.8		17.6	22.5	-4.9	-11.5		11.7	11.5	0.3	0.6
Total AFDC/TANF Benefits ($)*	$2,638	$2,563	$74	1.9		$1,880	$2,113	-$233	-6.0		$1,389	$1,408	-$19	-0.5
Receipt of Other Welfare Benefits														
Ever Received Welfare***	72.9	71.4	1.5	3.2		66.5	67.2	-0.7	-1.5		59.6	55.3	4.3	9.1
Total Welfare Benefits ($)*	$6,518	$6,928	-$409	-5.4		$6,150	$5,415	$735	9.7		$3,424	$4,239	-$815	-10.8
Ever Received Food Stamps***	65.9	64.5	1.4	2.9		58.7	62.5	-3.8	-7.7		50.0	48.2	1.8	3.6
Total Food Stamp Benefits ($)*	$2,447	$2,370	$77	2.8		$1,886	$2,442	-$556**	-20.4		$1,461	$1,464	-$2	-0.1
Income/Poverty														
Income Above Poverty Level***	24.8	33.8	-9.0**	-18.3		48.9	39.2	9.7*	14.7		54.6	65.7	-11.1**	-22.5
Subsequent Births														
Subsequent Birth by 24 Months after Random Assignment***	24.2	35.4	-11.2***	-24.9		23.6	31.4	-7.8	-17.4		22.4	19.3	3.1	6.9
Sample Size	**475**	**448**	**923**			**292**	**283**	**575**			**269**	**239**	**508**	

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

TABLE E.VII.13 (*continued*)

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.14

IMPACTS ON SERVICE RECEIPT DURING THE FIRST 28 MONTHS, BY MARITAL STATUS AND LIVING ARRANGEMENT AT ENROLLMENT

	Lived with Spouse				Lived with Other Adults				Lived Alone with Child		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Any Services											
Any Key Services***[a,b]	99.4	81.3	18.1***		96.4	83.0	13.4***		94.8	79.6	15.2***
Any Home Visits Or Center-Based Child Care***	96.7	50.9	45.8***		93.1	57.8	35.3***		90.5	62.2	28.3***
More Than 1 Home Visit or 2 Weeks Center-Based Child Care***	95.3	46.9	48.4***		91.9	49.5	42.4***		89.7	57.5	32.2***
Home Visits or Center Care at Required Intensity in at Least 1 Followup***	83.0	12.2	70.8***		72.1	13.5	58.7***		72.3	10.9	61.4***
Home Visits or Center Care at Required Intensity in All 3 Followups***	37.1	2.9	34.2***		26.4	1.7	24.7***		28.6	2.0	26.6***
Home Visits											
Any Home Visits***	94.6	26.9	67.7***		87.2	38.8	48.4***		84.1	33.7	50.4***
Any Child Development Services During Home Visits***	93.4	24.1	69.3***		86.0	35.8	50.2***		82.9	30.0	52.9***
Weekly Home Visits, 1st Follow-Up Period***	57.9	1.3	56.6***		48.3	6.3	42.0***		40.9	2.8	38.1***
Weekly Home Visits, 2nd Follow-Up Period***	51.8	2.2	49.7***		36.7	3.2	33.5***		32.9	2.6	30.2***
Weekly Home Visits, 3rd Follow-Up Period***	42.1	1.5	40.6***		29.0	3.0	26.0***		25.0	3.5	21.5***
Weekly Home Visits in At Least 1 Followup***	72.4	4.4	67.9***		58.6	8.6	50.0***		51.4	5.7	45.6***
Weekly Home Visits in All 3 Followups***	30.4	0.0	30.8***		19.2	1.0	18.2***		17.2	1.1	16.1***
Child Care											
Any Child Care***	72.1	66.5	5.7		88.7	82.5	6.2**		89.8	84.8	5.0*
Any Center-Based Child Care***	34.7	31.5	3.1		51.1	30.6	20.5***		52.0	40.6	11.5***
Average Hours Per Week of Center-Based Care	3.2	2.2	1.0		4.8	2.2	2.6***		5.9	3.1	2.8***
Concurrent Child Care Arrangements***	38.0	39.4	-1.4		59.2	44.8	14.4***		49.9	47.6	2.3
Average Weekly Out-of-Pocket Cost of Care	$5.68	$5.32	$0.36		$3.71	$5.87	-$2.16*		$5.73	$7.34	-$1.60
Received a Child Care Subsidy***	11.6	16.9	-5.4		29.1	34.7	-5.7		48.3	44.7	3.6
Child Was in Care at 12 Months of Age***	46.5	39.0	7.5		71.4	60.1	11.3***		72.2	59.8	12.5***
Child Was in Care at 24 Months of Age***	46.2	37.2	8.9		73.4	59.1	14.4***		66.1	53.7	12.4***
Case Management											
Any Case Management Meetings***	91.5	52.1	39.5***		86.2	62.5	23.7***		83.1	55.7	27.5***
Weekly Case Management, 1st Follow-Up Period***	53.8	5.7	48.1***		46.6	12.4	34.2***		41.2	10.8	30.4***
Weekly Case Management, 2nd Follow-Up Period***	47.1	4.2	42.9***		33.0	6.9	26.2***		31.7	5.2	26.6***
Weekly Case Management, 3rd Follow-Up Period***	41.0	4.1	36.9***		31.0	5.3	25.7***		23.9	6.2	17.8***

TABLE E.VII.14 (*continued*)

	Lived with Spouse				Lived with Other Adults				Lived Alone with Child		
	Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant		Program Group	Control Group	Impact Estimate per Eligible Applicant
Group Activities											
Any Group Parenting Activities***	78.5	45.8	32.8***		67.7	39.3	28.4***		68.7	29.1	39.6***
Any Parent-Child Group Activities***	54.2	18.5	35.7***		37.4	14.2	23.2***		36.6	11.2	25.4***
Early Intervention Services											
Identification of Child's Disability***	11.8	4.3	7.5***		5.9	5.4	0.5		5.3	6.3	-1.0
Services for Child With Disability***	6.4	3.7	2.6		3.2	3.1	0.1		3.3	3.7	-0.4
Child Health Services											
Any Child Health Services***	100.0	100.0	0.0		100.0	99.8	0.3		100.0	99.8	0.2
Any Doctor Visits***	99.8	98.9	0.9		98.6	98.2	0.5		99.7	98.7	0.9
Any Emergency Room Visits***	53.1	46.6	6.5		57.2	52.5	4.7		54.9	57.8	-2.9
Number of Emergency Room Visits for Injuries	0.2	0.3	-0.0		0.2	0.3	-0.1		0.3	0.3	-0.1
Any Dentist Visits***	34.6	25.3	9.3*		25.3	24.7	0.6		28.0	30.3	-2.3
Any Screening Tests***	61.3	57.7	3.6		66.4	67.0	-0.6		70.9	73.2	-2.3
Any Immunizations***	100.0	96.8	3.6***		98.7	98.3	0.4		98.3	99.0	-0.7
Family Development Services											
Any Education-Related Services***	84.7	49.7	35.0***		89.9	63.0	26.9***		84.1	57.8	26.3***
Any Employment-Related Services***	75.8	29.3	46.5***		76.7	50.5	26.3***		84.5	66.3	16.2***
Any Family Health Services[c]	100.0	100.0	0.0		100.0	100.0	0.0		100.0	100.0	0.0
Any Family Mental Health Services***	22.3	20.7	1.6		22.7	22.9	-0.2		26.4	25.8	0.6
Transportation Assistance***	27.0	15.7	11.3***		34.3	26.0	8.3**		37.9	25.6	12.4***
Housing Assistance***	45.5	45.7	-0.2		55.7	52.3	3.4		62.5	62.4	0.1
Sample Size	**276**	**270**	**546**		**414**	**406**	**820**		**386**	**329**	**715**

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroups are included in the estimates for each subgroup.

[a] Home visits, case management, center-based child care, and/or group parenting activities.

[b] Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups in the first two columns. The third column is a subset of the second column and is included to aid interpretation of subgroup differences.

[c] There is no variance across subgroups due to lack of variance in level of services.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.15

IMPACTS ON CHILD AND FAMILY OUTCOMES AT AGE 3, BY MARITAL STATUS AND LIVING ARRANGEMENT AT ENROLLMENT

	Lived with Spouse					Lived with Other Adults					Lived Alone with Child			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Cognitive and Language Development														
Bayley Mental Development Index (MDI) Standard Score	94.5	93.1	1.3	10.3		90.6	87.5	3.1***	24.1		91.9	90.6	1.3	10.4
Percentage with MDI < 85***[d]	19.1	26.9	-7.8	-16.7		28.0	37.3	-9.3**	-19.9		27.8	29.5	-1.7	-3.6
Peabody Picture Vocabulary Test (PPVT)-III Standard Score	86.6	88.0	-1.4	-8.8		81.6	79.9	1.8	11.0		86.7	85.2	1.5	9.0
Percentage with PPVT-III < 85***	37.2	43.4	-6.2	-12.5		55.9	62.0	-6.1	-12.3		41.4	44.9	-3.4	-6.9
Child Social-Emotional Development-1.4														
Engagement of Parent During Parent-Child Semistructured Play	4.8	4.6	0.2	14.1		4.9	4.5	0.4***	34.4		4.8	4.7	0.1	4.5
Sustained Attention with Objects During Parent-Child Semistructured Play**	4.9	4.9	-0.0	-1.1		5.1	4.8	0.4***	35.2		4.9	4.8	0.1	5.0
Engagement of Parent During Parent-Child Puzzle Challenge Task	5.1	5.1	-0.0	-0.2		5.0	4.9	0.1	13.9		4.9	4.9	0.1	5.5
Persistence During Parent-Child Puzzle Challenge Task	4.7	4.7	0.0	0.2		4.4	4.4	0.0	0.8		4.6	4.5	0.1	8.3
Bayley Behavioral Rating Scale (BRS): Emotional Regulation	4.0	4.0	-0.0	-0.5		3.9	3.9	-0.0	-1.4		4.0	3.9	0.1	6.6
Bayley BRS: Orientation/ Engagement	3.8	3.7	0.1	11.3		3.9	3.9	0.0	5.0		3.8	3.8	-0.0	-4.4
Negativity Toward Parent During Parent-Child Semistructured Play	1.3	1.2	0.0	4.7		1.3	1.4	-0.1*	-18.1		1.3	1.4	-0.1	-18.4
Frustration During Parent-Child Puzzle Challenge Task	3.1	2.8	0.3	22.2		2.6	2.8	-0.1	-10.6		2.7	2.7	0.1	4.3

TABLE E.VII.15 (*continued*)

	Lived with Spouse					Lived with Other Adults					Lived Alone with Child			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Child Behavior Checklist—Aggressive Behavior	10.7	11.1	-0.4	-6.3		10.8	12.1	-1.3**	-20.1		10.8	11.5	-0.7	-11.4
Child Health Status														
Child's Health Status	4.0	4.0	0.0	2.1		4.0	4.0	-0.0	-4.1		4.0	4.0	0.0	0.5
Percentage of Children in Fair or Poor Health***	8.2	8.5	-0.3	-1.1		7.6	9.5	-1.8	-6.4		10.0	8.7	1.3	4.6
Quality of the Home Environment and Parenting: Overall and Physical Environment														
Home Observation for Measurement of the Environment (HOME) Total Score	28.1	27.8	0.3	6.1		26.7	26.0	0.6	12.3		27.8	27.2	0.6	12.4
HOME Internal Physical Environment	7.9	8.0	-0.1	-3.6		7.5	7.6	-0.1	-7.8		7.9	7.9	-0.0	-2.3
Parenting Behavior: Emotional Support														
HOME Warmth	2.7	2.7	0.1	7.8		2.4	2.3	0.1	12.1		2.6	2.6	0.1	6.2
Supportiveness During Parent-Child Semistructured Play	4.0	4.0	0.0	2.3		3.9	3.7	0.2*	16.5		4.1	4.0	0.1	10.8
Supportive Presence During Parent-Child Puzzle Challenge Task	4.7	4.7	-0.1	-4.2		4.3	4.1	0.2	11.8		4.6	4.7	-0.1	-6.3
Parenting Behavior: Stimulation of Language and Learning														
Percentage of Children with a Regular Bedtime***	59.9	60.5	-0.6	-1.2		56.5	55.8	0.7	1.5		58.9	58.6	0.2	0.5
Percentage of Children Who Follow a Bedtime Routine***	75.5	72.7	2.9	6.2		65.0	67.9*	-2.8	-6.1		71.0	68.1	2.9	6.3
HOME: Support of Language and Learning	10.6	10.6	0.0	2.0		10.4	10.2	0.2	11.1		10.7	10.6	0.2	7.3
Parent-Child Play	4.4	4.2	0.2*	19.4		4.4	4.4	0.0	3.9		4.4	4.4	0.0	3.1
Quality of Assistance During Parent-Child Puzzle Challenge Task	3.9	3.7	0.2	12.7		3.6	3.3	0.3**	21.3		3.7	3.5	0.1	11.9

TABLE E.VII.15 (*continued*)

	Lived with Spouse					Lived with Other Adults					Lived Alone with Child			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Percentage of Parents Who Read to Child Daily***	62.8	48.5	14.3***	28.7		55.3	51.9	3.3	6.7		56.2	53.8	2.4	4.7
Percentage of Parents Who Read to Child at Bedtime***	37.1	35.2	1.9	4.1		27.9	26.5	1.4	3.0		34.7	30.9	3.8	8.4
Parenting Behavior: Negative Parenting Behavior														
Detachment During Parent-Child Semistructured Play	1.2	1.2	-0.1	-7.3		1.3	1.3	-0.0	-0.6		1.2	1.3	-0.1	-11.0
Intrusiveness During Parent-Child Semistructured Play	1.6	1.5	0.1	15.3		1.7	1.8	-0.1	-13.9		1.5	1.6	-0.0	-2.9
Detachment During Parent-Child Puzzle Challenge Task	1.5	1.4	0.1	7.1		1.8	1.8	-0.1	-6.8		1.6	1.5	0.0	1.4
Intrusiveness During Parent-Child Puzzle Challenge Task	2.4	2.4	0.0	1.0		2.9	3.0	-0.1	-8.2		2.6	2.6	-0.1	-5.6
Negative Regard During Parent-Child Semistructured Play	1.2	1.2	0.1	8.0		1.4	1.3	0.0	4.8		1.3	1.4	-0.1	-19.8
HOME Harshness	0.1	0.2	-0.1	-9.0		0.4	0.4	-0.0	-1.0		0.3	0.3	6.0	0.1
Percentage of Parents Who Spanked Child in the Past Week***	38.6	45.8	-7.2	-14.4		48.6	57.8	-9.2**	-18.4		43.1	50.3	-7.3	-14.5
Knowledge of Safety Practices and Discipline Strategies														
Percentage of Parents Who Usually Use a Car Seat Correctly***	77.8	74.4	3.4	7.4		63.6	66.2	-2.6	-5.7		69.9	71.0	-1.1	-2.4
Percentage of Parents Suggesting Physical Punishment as a Discipline Strategy***	28.9	33.6	-4.7	-9.4		49.7	56.2	-6.5*	-13.0		44.3	53.5	-9.2**	-18.5
Percentage of Parents Who Would Use Mild Discipline Only***	57.6	53.3	4.3	8.8		43.8	37.6	6.3*	-12.7		47.3	37.8	9.5**	1.3

TABLE E.VII.15 (*continued*)

	Lived with Spouse					Lived with Other Adults					Lived Alone with Child			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Index of Severity of Discipline Strategies	2.8	3.0	-0.2	-13.5		3.5	3.7	-0.2*	-12.3		3.2	3.6	-0.4***	-23.7
Parent Physical and Mental Health														
Parent's Health Status	3.4	3.5	-0.1	-12.7		3.4	3.5	-0.1	-4.5		3.3	3.4	-0.1	-14.1
Parenting Stress Index (PSI) Parental Distress	25.3	25.2	0.0	0.2		25.1	25.7	-0.6	-6.7		24.4	26.4	-2.0**	-20.4
PSI Parent-Child Dysfunctional Interaction	18.6	17.5	1.2	18.9		17.9	18.1	-0.2	-2.9		17.7	17.8	-0.2	-2.6
Center for Epidemiological Studies Depression (CES-D; Short Form)	6.8	6.8	0.1	0.8		8.4	8.6	-0.3	-3.8		7.6	7.9	-0.3	-4.6
CES-D Severe Depressive Symptoms ***	10.3	13.0	-2.7	-7.4		19.5	16.6	2.9	8.2		13.7	17.8	-4.0	-11.2
Family Environment Scale (FES): Family Conflict	1.6	1.6	-0.0	-3.2		1.7	1.7	0.0	1.1		1.6	1.7	-0.1	-11.8
Father Presence														
Currently Married To Biological Father ***	83.7	86.4	-2.7	-5.6		20.0	20.1	-0.1	-0.3		17.4	15.2	2.2	4.5
Biological Father is Currently Married to, Lives with, or is Boyfriend of Respondent***	84.0	88.1	-4.1	-8.2		44.3	43.7	0.5	1.1		29.4	29.3	0.2	0.3
Biological Father Currently Present in Child's Life***	92.1	97.0	-4.9*	-10.8		69.9	66.4	3.5	7.7		57.6	53.8	3.8	8.6
Continuous Biological Father Presence Child Age 14-36 Months***	93.6	97.1	-3.5	-7.6		58.0	60.9	-2.9	-6.3		48.1	44.7	3.4	7.3
No Biological Father Presence Child Age 14-36 Months***	0.6	-0.1	0.7	2.2		16.6	17.9	-1.3	-4.3		20.3	20.7	-0.4	-1.1

TABLE E.VII.15 (*continued*)

	Lived with Spouse					Lived with Other Adults					Lived Alone with Child			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]		Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Continuous Male Presence Child Age 14-36 Months***	93.4	98.6	-5.2**	-14.6		76.0	81.3	-5.3	-14.9		69.4	78.2	-8.8	-24.6
No Male Presence Child Age 14-36 Months***	0.0	0.0	0.0	0.0		1.8	2.0	-0.2	-1.9		3.8	4.1	-0.2	-1.9
Sample Size														
Bayley	**213**	**203**	**416**			**354**	**305**	**659**			**312**	**268**	**580**	
Parent Interview	**288**	**269**	**557**			**425**	**388**	**813**			**394**	**341**	**735**	
Parent-Child Interactions	**221**	**213**	**434**			**356**	**313**	**669**			**297**	**255**	**552**	

SOURCE: Parent interviews, child assessments, interviewer observations, and assessments of semistructured parent-child interactions conducted when children were approximately 36 months old.

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.

TABLE E.VII.16

IMPACTS ON SELF-SUFFICIENCY AT 28 MONTHS, BY MARITAL STATUS AND LIVING ARRANGEMENT AT ENROLLMENT

	Lived with Spouse				Lived with Other Adults				Lived Alone with Child			
Outcome	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]	Program Group Participants	Control Group[a]	Impact Estimate per Participant[b]	Effect Size[c]
Education/Job Training												
Ever in Education or Training***[d]	45.3	41.9	3.4	6.8	66.3	58.6	7.7**	15.4	58.0	47.1	10.9**	21.7
Ever in High School***	1.0	0.9	0.1	0.5	22.7	17.5	5.2*	18.1	8.9	4.5	4.4*	15.4
Ever in ESL Class***	7.7	3.4	4.3*	30.4	2.3	0.6	1.7*	12.0	2.7	4.4	-1.7	-11.7
Ever in Vocational Program***	9.9	13.8	-3.9	-10.3	21.8	20.4	1.4	3.8	19.2	14.8	4.4	11.7
Average Hours per Week in Education or Training	1.6	1.3	0.3	4.9	6.5	4.7	1.8***	28.2	3.9	3.1	0.8	11.8
In Education or Training:												
1st Quarter***	8.5	12.1	-3.6	-8.7	27.3	24.9	2.4	5.7	20.4	20.1	0.3	0.7
2nd Quarter***	13.1	14.7	-1.6	-3.6	34.1	28.0	6.1*	14.2	23.0	24.0	-1.0	-2.3
3rd Quarter***	15.6	14.1	1.5	3.4	38.7	29.3	9.4***	21.3	29.8	28.4	1.4	3.3
4th Quarter***	14.6	13.5	1.2	2.6	38.1	25.2	12.9***	30.1	29.7	27.4	2.3	5.4
5th Quarter***	12.5	14.0	-1.5	-3.4	37.8	27.4	10.4***	24.2	29.7	27.9	1.8	4.3
6th Quarter***	16.1	12.6	3.6	8.5	37.5	30.3	7.3*	17.5	28.1	21.9	6.2	14.9
7th Quarter***	15.1	12.2	2.9	7.2	32.2	26.8	5.4	13.5	25.3	18.3	6.9*	17.3
8th Quarter***	18.6	9.4	9.2**	23.5	31.2	24.6	6.6*	16.8	24.4	18.0	6.5	16.5
Have High School Diploma***	53.7	56.2	-2.5	-4.9	44.7	43.1	1.6	3.2	50.4	49.1	1.3	2.6
Have GED***	6.9	4.4	2.5	7.8	14.7	14.3	0.4	1.3	8.9	13.5	-4.6	-14.5
Employment												
Ever Employed***	81.1	77.5	3.6	9.6	87.4	87.1	0.3	0.9	86.5	83.9	2.6	7.0
Average Hours/Week Employed	16.5	16.8	-0.4	-2.6	17.1	15.7	1.3	9.1	17.4	18.0	-0.6	-4.4
Employed in:												
1st Quarter***	42.1	35.1	7.0	14.4	32.6	36.1	-3.5	-7.2	45.5	44.4	1.2	2.4
2nd Quarter***	45.2	40.6	4.6	9.3	43.1	44.4	-1.2	-2.5	49.6	47.5	2.0	4.1
3rd Quarter***	55.6	50.1	5.5	11.0	52.9	54.4	-1.5	-3.0	52.2	51.8	0.4	0.8
4th Quarter***	59.5	52.9	6.5	13.1	54.9	57.6	-2.8	-5.6	56.1	53.6	2.5	4.9
5th Quarter***	62.7	57.4	5.3	10.8	60.4	60.9	-0.6	-1.1	62.8	61.2	1.6	3.3
6th Quarter***	61.1	57.2	3.9	7.9	65.6	58.7	6.9	14.0	64.9	63.4	1.6	3.2
7th Quarter***	60.0	54.3	5.7	11.4	59.9	57.2	2.7	5.5	60.9	60.1	0.8	1.5
8th Quarter***	61.8	56.4	5.4	11.0	64.4	61.3	3.0	6.2	63.6	63.2	0.4	0.8
Any Self-Sufficiency-Oriented Activity (Education, Training or Employment)												
Ever Employed or in Education/Training***	89.6	85.8	3.7	12.3	94.6	94.1	0.4	1.4	93.1	89.8	3.2	10.7
Average Hours per Week in Any Activity	18.5	18.7	-0.3	-1.6	24.3	20.6	3.6***	23.1	21.9	21.6	0.4	2.3

TABLE E.VII.16 (*continued*)

Outcome	Lived with Spouse: Program Group Participants	Lived with Spouse: Control Group[a]	Lived with Spouse: Impact Estimate per Participant[b]	Lived with Spouse: Effect Size[c]	Lived with Other Adults: Program Group Participants	Lived with Other Adults: Control Group[a]	Lived with Other Adults: Impact Estimate per Participant[b]	Lived with Other Adults: Effect Size[c]	Lived Alone with Child: Program Group Participants	Lived Alone with Child: Control Group[a]	Lived Alone with Child: Impact Estimate per Participant[b]	Lived Alone with Child: Effect Size[c]
In Activities in:												
1st Quarter***	46.2	41.1	5.1	10.3	50.1	54.3	-4.2	-8.4	59.1	55.8	3.3	6.6
2nd Quarter***	52.3	46.9	5.4	11.0	62.6	62.4	0.2	0.3	65.0	59.3	5.6	11.4
3rd Quarter***	62.8	57.7	5.1	10.7	71.9	70.6	1.4	2.8	70.6	66.4	4.2	8.9
4th Quarter***	65.2	58.3	6.9	14.4	73.5	70.1	3.4	7.1	71.9	66.3	5.6	11.8
5th Quarter***	66.0	61.3	4.6	10.0	77.4	73.0	4.5	9.6	73.6	73.0	0.6	1.2
6th Quarter***	67.5	61.4	6.1	13.0	80.8	72.6	8.2**	17.5	76.9	71.2	5.7	12.2
7th Quarter***	64.3	58.9	5.4	11.2	74.9	70.3	4.7	9.7	71.8	65.9	5.9	12.3
8th Quarter***	68.0	59.2	8.8*	18.8	76.3	72.9	3.3	7.1	74.7	69.0	5.7	12.2
AFDC/TANF Receipt												
Ever Received AFDC/TANF***	20.7	20.0	0.7	1.4	51.0	50.4	0.6	1.2	59.9	58.8	1.2	2.4
Received AFDC/TANF in:												
1st Quarter***	13.5	10.3	3.1	6.7	35.4	33.1	2.3	4.8	46.3	46.0	0.4	0.8
2nd Quarter***	14.4	12.1	2.3	4.8	36.3	35.2	1.1	2.3	46.6	47.9	-1.4	-2.8
3rd Quarter***	14.6	14.4	0.3	0.6	39.5	38.3	1.2	2.6	49.3	49.3	0.0	-0.1
4th Quarter***	8.4	10.3	-2.0	-4.2	31.3	32.7	-1.4	-3.0	45.2	43.6	1.6	3.5
5th Quarter***	8.2	8.6	-0.4	-0.8	30.8	30.8	0.0	-0.1	42.7	46.3	-3.6	-7.9
6th Quarter***	9.5	10.9	-1.4	-3.1	29.5	32.5	-3.0	-6.6	43.9	46.3	-2.4	-5.2
7th Quarter***	6.9	8.1	-1.3	-2.8	20.6	29.6	-8.9**	-20.3	35.0	38.8	-3.8	-8.6
8th Quarter***	6.3	4.2	2.1	5.0	19.9	28.2	-8.3**	-19.6	35.1	32.0	3.1	7.3
Total AFDC/TANF Benefits ($)*	$822	$571	$251	6.5	$2,163	$2,433	-$270	-7.0	$3,579	$3,602	-$22	-0.6
Receipt of Other Welfare Benefits												
Ever Received Welfare***	46.1	42.8	3.4	7.2	72.6	70.6	2.0	4.3	77.1	76.9	0.2	0.4
Total Welfare Benefits ($)*	$1,928	$1,630	$298	3.9	$6,319	$6,440	-$121	-1.6	$7,396	$8,153	-$757	-10.0
Ever Received Food Stamps***	40.2	38.7	1.5	3.1	64.0	62.3	1.7	3.6	70.0	71.2	-1.2	-2.5
Total Food Stamp Benefits ($)	$1,126	$752	$374	13.7	$2,262	$2,259	$3.3	0.1	$2,794	$2,858	-$64	-2.3
Income/Poverty												
Income Above Poverty Level***	54.1	57.1	-3.1	-6.2	38.1	41.0	-2.9	-5.9	33.4	37.0	-3.6	-7.4
Subsequent Births												
Subsequent Birth by 24 Months after Random Assignment***	22.2	27.1	-5.0	-11.1	26.5	31.5	-5.0	-11.1	17.2	27.7	-10.5**	-23.3
Sample Size	**276**	**270**	**546**		**414**	**406**	**820**		**386**	**529**	**715**	

SOURCE: Parent Services Follow-Up Interviews completed an average of 7, 16, and 28 months after random assignment.

TABLE E.VII.16 (*continued*)

NOTE: All estimates were calculated using regression models, where each site was weighted equally. Only sites with at least 10 program group members and 10 control group members in the subgroup are included in the estimates for each subgroup.

[a]A participant is defined as a program group member who received more than one Early Head Start home visit, met with an Early Head Start case manager more than once, received at least two weeks of Early Head Start center-based care, and/or participated in Early Head Start group parent-child activities. The control group mean is the mean for the control group members who would have participated in Early Head Start if they had instead been assigned to the program group. This unobserved mean is estimated as the difference between the program group mean for participants and the impact per participant.

[b]The estimated impact per participant is measured as the estimated impact per eligible applicant divided by the proportion of program group members who participated in Early Head Start services (which varied by site). The estimated impact per eligible applicant is measured as the difference between the regression-adjusted means for program and control group members.

[c]The effect size is calculated by dividing the estimated impact per participant by the standard deviation of the outcome measure for the control group times 100 (that is, it is the impact per participant expressed as a percentage of a standard deviation).

[d]Asterisks next to variable names indicate significance levels for statistical tests of differences in impacts across the subgroups.

*Significantly different from zero at the .10 level, two-tailed test.
**Significantly different from zero at the .05 level, two-tailed test.
***Significantly different from zero at the .01 level, two-tailed test.