

Evaluation of the Parent-Child Home Program/Play & Learn Group Demonstration Project 2005-2010

Final Report

Prepared for Business Partnership for Early Learning & City of Seattle
Prepared by Organizational Research Services
November 2010

TABLE OF CONTENTS

- Executive Summary 1
- Introduction 5
- Methodology 9
- Implementing PCHP 12
- Impact on Caregivers 15
- Impact on Children 23
- Impact on Families 29
- Changes in Communities 34
- Exploring Differences in Impact 36
- Longer-Term Impact 38
- Lessons Learned from the Demonstration 42
- Looking Ahead 46
- Conclusion 48

TABLE OF TABLES

- TABLE 1: Percentage of Enrolled Participants with Completion and Demographic Characteristics 13
- TABLE 2: TROLL Average Scores for All Common Items and Subscales at Two Time Points 26
- TABLE 3: Percentage of PCHP Graduates from Cohorts 2 and 3 with Specific Transition Plans..... 38

TABLE OF FIGURES

- FIGURE 1: PACT Average Score Across Items..... 16
- FIGURE 2: Percentage of Caregivers Attaining PACT Average Score of 3 or Greater 17
- FIGURE 3: PACT Average Score: Showing Affection Subscale..... 19
- FIGURE 4: PACT Average Score: Verbalizing Directions Subscale 19
- FIGURE 5: CBT Average Score Across Items 24
- FIGURE 6: Percentage of Children Attaining CBT Average Score of 3 or Greater 25
- FIGURE 7: Percentage of Participants Attending Play & Learn 31

APPENDICES

APPENDIX A: Average Assessment Score by Item

APPENDIX B: Differences in Program Impact by Subgroup

EXECUTIVE SUMMARY

The **Business Partnership for Early Learning (BPEL)**, a coalition of King County business leaders, joined with the City of Seattle to invest in the Parent-Child Home Program – an evidence-based practice that has been proven to effectively serve diverse, hard-to-reach families with young children. Their goals were to promote early learning and help high-need children reach their full potential in the classroom. BPEL engaged **Organizational Research Services (ORS)**, an independent evaluation consulting company, to conduct an outcome-based and process evaluation of the five-year demonstration project.

ORS created an evaluation plan to collect data on outcomes related to child and parent changes using observational assessments and parent interviews. The evaluation was designed specifically to inform funders and funded community agencies about the short-term impacts of the program while being culturally sensitive and non-invasive to participating families. To document program implementation, ORS regularly attended agency staff meetings and convened meetings of Agency Coordinators and representatives of BPEL and the City of Seattle to discuss successes and challenges. In preparation for the final report, ORS also conducted focus groups with Home Visitors and interviews with Agency Coordinators and funders.

The final report presents results from across four cohorts of families who completed the two-year program from 2005-2010 and lifts up findings to support future expansion of the model in King County, led by United Way of King County, and potentially in other parts of Washington State.

Overview of the Parent Child Home Program

The Parent-Child Home Program (PCHP), developed in 1965, is a research-based early childhood literacy and school readiness home visiting program for families with two- to four-year-old children facing multiple obstacles to educational and economic success. The program aims to strengthen families and prepare children for academic success through intensive home visiting. Families receive two 30-minute visits per week for 23 weeks each year for two years, a total of 92 visits. During these visits, a Home Visitor utilizes a non-directive approach and a high-quality toy or book to model behaviors for parents that enhance children's development.

The program is designed to substantially increase parents' verbal interaction with their children and other parenting skills and thus increase the cognitive and emotional development of at-risk toddlers. PCHP has been evaluated for longer-term child outcomes in many communities during its 45 years of implementation. Previous research studies indicate that toddlers at risk of educational disadvantage who participate in PCHP have demonstrated increased cognitive skills, academic achievement and high school graduation rates compared with their peers.

Implementation of the Parent Child Home Program in Seattle

Three multi-service agencies provided PCHP in Seattle: Neighborhood House, Atlantic Street Center, and Southwest Youth & Family Services. These agencies implemented PCHP with fidelity to the evidence-based national model and demonstrated key elements of quality implementation, including recruitment of Home Visitors who share cultural and language backgrounds with target program participants; high levels of supervision, training and support for Home Visitors to ensure implementation of key elements; and active participation in the evaluation.

Program participation data show that BPEL reached its target population of ethnically diverse, low-income families⁴ and the vast majority of families completed the full two-year program. Since Winter 2006 when the program began, **467 families** enrolled in Seattle's Parent-Child Home Program across four completed cohorts. Almost ninety percent of enrolled families had an income below the 2010 poverty line, almost seventy percent of families spoke a language other than English at home, and about twenty-two percent of families were African American. Overall, **85 percent of enrolled families completed both years of the program,** and this rate has been increasing over time. According to Program Coordinators, most of the families who did not complete the program moved outside of the service area.

BPEL provided additional supports intended to strengthen the impact of PCHP and provide complementary outcomes for parents and children, including investment in Play & Learn Groups and support for Neighborhood House Home Visitors to provide their immigrant and refugee families with five additional weeks of home visits to learn typical American songs and rhymes that children would encounter in other early childhood and school settings. Since fall 2008, the Seattle Public Library has partnered with Neighborhood House and Atlantic Street Center to incorporate the Raising A Reader program into the first year of PCHP. Raising A Reader is a "book bag" program that provides participating families access to a lending library and introduces families to their local library so that they can continue to borrow children's books after the program ends.

Impact on Caregivers

PCHP intends to change behaviors of both adults and children through their interactions with the Home Visitor. With training and support from ORS and Agency Coordinators, Home Visitors assess the participating adult on the frequency of their use of 20 positive parenting behaviors and interactions through the **Parent And Child Together (PACT) observational assessment.** The PACT was completed at three time points during the two-year program: at baseline, end of year one, and end of year two.

Between each time point, caregivers exhibited statistically significant increases in the frequency of positive behaviors and interactions on all PACT assessment items and on an average score across items, providing strong and consistent evidence of enhanced caregiver-child interactions and increases in caregivers' use of positive parenting behaviors as a result of the program. **By the end of the second year of the program, over 90 percent of caregivers exhibited positive parenting behaviors and interactions with an average frequency of "most of the time" or greater.**

Through interviews, caregivers explained that they are more engaged with their child and better able to support their child's school readiness as a result of PCHP. Caregivers said that they now ask their child more questions, listen and speak more to the child, engage in conversations, and read and play. Caregivers also expressed confidence and excitement about staying involved in their child's development and learning. One caregiver stated: **"I feel really good. I know what I am doing to help my child to be ready to go the school."** Program staff report that caregivers increasingly recognized that children start learning at birth, and in many cases, this shift in attitude also appeared to extend to fathers and other relatives, even if they did not actively participate in the program. **"My family has been changing to be my child's teacher."**

Impact on Children

PCHP intends to improve children's behaviors related to social-emotional development and self-regulation and increase their pre-literacy skills. Home Visitors assess the participating child on the frequency of 20 positive child behaviors through the **Child Behavior Traits (CBT) observational assessment**, completed at three time points during the two-year program: at baseline, end of year one, and end of year two. To assess the child's pre-literacy skills, Home Visitors complete the **Teacher Rating of Oral Language and Literacy (TROLL) observational assessment** at two time points: end of year one and end of year two. With permission from the developer, ORS adapted this tool to be language neutral and appropriate for a home visit setting.

Between each time point, children exhibited statistically significant increases in the frequency of positive behaviors on all CBT items and on an average score across items, providing strong and consistent evidence of increases in children's social-emotional development and self-regulation skills. **By the end of the second year of the program, over 90 percent of participating children exhibited positive behaviors with an average frequency of "most of the time" or greater.**

Between the end of the first and second years of the program, children also exhibited statistically significant increases in ratings of their pre-literacy skills on TROLL items. These significant increases held true for an overall average score as well as for each of three TROLL subscales: Language Use, Reading, and Print Concepts.

Additional Impacts on Families and Communities

Extending the parent-child relationship beyond the home and into the community was another benefit of the demonstration project. **Through interviews, caregivers reported that their family began new activities outside of the home since participating in PCHP**, particularly activities at the library and Play & Learn groups. Caregivers felt that these activities supported their children's socialization and learning. Moreover, according to program staff, caregivers began accessing additional resources and services for their families and became more empowered and involved in all of their children's' education as a result of their participation in PCHP.

There's some evidence that the impact of PCHP extended beyond the participating families to the friends and neighbors interacting with those families. Program staff shared that recruiting families to participate in PCHP became easier over time as awareness of PCHP spread through word of

Executive Summary

mouth and non-participants witnessed the program's impact. They noted that many non-participating caregivers are following PCHP participants in recognizing that young children can learn, in part by observing changes among participating children.

Longer-Term Impact

Most families graduating from PCHP are transitioning their children into formal preschool programs. Almost 90 percent of caregivers who graduated from PCHP in 2008 and 2009 enrolled their children in formal preschool programs following PCHP. Caregivers also expressed an intention to continue participating in other programs at the library and Play & Learn Groups beyond PCHP.

PCHP graduates who enter Seattle Public Schools will be tracked over time to examine their academic achievement compared with a control group of their peers. As standardized assessment and high school graduation data become available, they will provide additional opportunities to explore the long-term impact of PCHP in Seattle. To date, two-thirds of graduates from PCHP in 2007 and 2008 have been identified in the Seattle Public School system.

Looking Ahead

United Way of King County assumed the role of funder of the BPEL PCHP programs in July 2010 and looks to expand the program throughout King County. This is an opportunity to reflect on the role of the business community in initiating this demonstration project and the contributions it has made to PCHP and the broader field.

The Business Partnership for Early Learning's investment in the community was key to the success of the PCHP Demonstration Project. Business leaders provided time, money, connections, expertise and clout, and they positioned the time-limited demonstration project for sustainability and expansion. The primary goal for the project was to show that children from diverse ethnic and language groups who were most likely to enter school unprepared could be effectively and sustainably served through an early learning program. Evaluation findings provide strong evidence that BPEL's goal was achieved.

United Way of King County is now set to continue PCHP in Seattle and expand the program in size and scale across King County, building on the experiences of this demonstration project. Over the next several years, United Way plans to offer PCHP to any family in King County living in poverty that is interested in and can benefit from it. Eventually, United Way hopes to serve 1200 families per year with PCHP, more than seven times the 160 families currently served on an annual basis.

Conclusion

Evaluation results demonstrate that Seattle agencies implemented PCHP with high quality and fidelity and achieved strong and consistent outcomes for families with demonstrated need. BPEL and the City of Seattle achieved their objectives for the time-limited demonstration project and, in partnership with the United Way of King County, positioned PCHP for sustainable expansion.

INTRODUCTION

The Business Partnership for Early Learning (BPEL) engaged Organizational Research Services (ORS), an independent evaluation consulting company, to conduct an outcome-based and process evaluation of the five-year Parent-Child Home Program/Play & Learn Group Demonstration Project funded by BPEL and the City of Seattle. This report presents results from across the four completed cohorts and lifts up findings to support future expansion of the model in Washington. This section presents some key background information.

Members of the business community invested in an early learning demonstration project to better understand how to effectively reach targeted high-need children and help them achieve their potential.

Started in 2005, the Business Partnership for Early Learning (BPEL), a coalition of King County business leaders, committed to investing resources to promote early learning and ensure that children who typically are least prepared for school have the opportunity to reach their full potential in the classroom. Data from Seattle Public Schools suggested that these children are concentrated in Southeast, Central and Southwest Seattle, live in poverty and are African-American, Native American or part of a family that does not speak English at home. These children also come from families that are often isolated and outside the reach of other formal programs. BPEL outlined a plan to tackle these issues directly by funding, deploying and testing a research-based approach to fostering school readiness that would reach the children with the largest preparedness gap. BPEL's investment was explicitly designed to support quality implementation of the research-based approach and evaluation for effectiveness and possible expansion.

BPEL invested in the Parent-Child Home Program, an evidence-based practice that has been proven to effectively serve diverse, hard-to-reach families and prepare their young children for school.

The Parent-Child Home Program (PCHP) is a research-based early childhood literacy and school readiness home visiting program for families with two- to four-year-old children facing multiple obstacles to educational and economic success, such as poverty, illiteracy, language barriers, and single or teenage parent status. The program aims to strengthen families and prepare children for academic success through intensive home visiting. The model was developed in 1965 “to enrich, by a unique, play-oriented, non-didactic approach, the parenting skills of parents challenged by low income and limited education, especially their verbal interaction with their young children, and to foster attachment between parent and child.”¹

Families receive two 30-minute visits per week for 23 weeks each year for two years. During these visits, a Home Visitor utilizes a non-directive approach by modeling behaviors for parents that enhance children's development through the use of a VISM (Verbal Interaction Stimulus Material), a high-quality toy or book that is developmentally appropriate and cognitively stimulating.

¹ Levenstein, Levenstein, Oliver. (2002) First grade school readiness of former child participants in a South Carolina replication of the Parent-Child Home Program. *Applied Developmental Psychology* 23, 331-353.

Introduction

The program is designed to increase the cognitive and emotional development—and thus the school readiness and perhaps eventual literacy—of at-risk toddlers and to promote parents’ verbal interaction with their children and other parenting skills, embedded in the attachment between the parent and child. Indeed, past research efforts have directly linked positive parenting behaviors and parent-child interactions to achievement of child outcomes. Relevant findings from a sample of past research studies supporting the link between caregiver and child outcomes include:²

- A study found that parents’ scores on the Parent And Child Together (PACT) observational assessment are strongly correlated with children’s scores on the Child Behavior Traits (CBT) observational assessment. This was especially true for PACT items related to verbal behaviors.³
- A series of studies found that parents’ verbal responsiveness during the second year of PCHP predicted not only children’s IQ scores at the end of the program but also their skills on the CBT two years later, including independence, task orientation, emotional stability and positive cognitive orientation.⁴
- A study utilized an observational assessment called the MIB, through which independent observers score parent-child interactions based on videotapes of dyadic play. Positive interactions measured by the MIB were shown to predict children’s first grade cognitive skills, school performance and emotional stability.⁵

PCHP has also been evaluated for longer-term child outcomes in many communities during its 45 years of implementation. Evaluation findings indicate that toddlers at risk of educational disadvantage who participate in PCHP have demonstrated the following:

- **Increased Cognitive Skills:** Children whose families received the PCHP model’s services had significantly higher scores on full scale verbal and performance IQ measures than those in a control group.⁶ A matched-comparison study of a cohort of PCHP graduates found that as first graders, PCHP graduates passed the Cognitive Skills Assessment Battery (an assessment implemented statewide in South Carolina) at a significantly higher rate than similar peers who did not participate in the program.⁷
- **Increased Academic Achievement:** Many studies have demonstrated PCHP participants’ strong performance in academic achievement. For example, a comprehensive study conducted in public schools in Pittsfield, Massachusetts found that PCHP graduates scored between one and three points higher than the national norm on the reading component of the California Achievement Test (CAT) and between one and four points higher than the national norm on the math component. In addition, a long-term evaluation of PCHP conducted in South Carolina showed decreased likelihood of involvement in special education for students at risk for experiencing academic challenges. Less than half of PCHP

² All of these studies are summarized in: Levenstein & Levenstein (2008). *Messages from Home: The Parent-Child Home Program for Overcoming Educational Disadvantage*. Philadelphia: Temple University Press. See for example Chapters 5 and 11.

³ *Ibid*, pg. 96.

⁴ *Ibid*, pg. 96.

⁵ *Ibid*, pg. 96.

⁶ Royce JM, Darlington RB and Murray HW. (1983). Pooled analyses: Findings across studies. In: Consortium for Longitudinal Studies, Ed. *As the Twig is Bent*. Hillsdale, NJ: Lawrence Erlbaum Associates.

⁷ Levenstein P, Levenstein S, Oliver D. (2002) First grade school readiness of former child participants in a South Carolina replication of the Parent-Child Home Program. *Applied Developmental Psychology* 23, 331-353.

graduates required the district's remedial services, although all had shown their "at-risk" eligibility for such services at pretest.⁸

- **Increased High School Graduation Rates:** In a long-term randomized comparison study conducted in Pittsfield, Massachusetts, PCHP graduates were found to have a significantly higher high school graduation rate than children in a local randomized control group and significantly lower high school drop-out rates. The high school graduation rate for PCHP participants was comparable to that of middle-class students.⁹

Beyond providing strong early learning supports, PCHP also supports families by addressing five protective factors that reduce the risk of child abuse and neglect, including knowledge of parenting and child development, social connections, concrete support in times of need, and parental resilience. These have been identified by the Strengthening Families National Network as factors that all effective child abuse prevention efforts should focus on developing in their work with families.¹⁰

Targeted families received PCHP from Home Visitors from three agencies: Neighborhood House, Atlantic Street Center and Southwest Youth & Family Services.

PCHP was implemented by high-capacity, multi-service agencies serving high-risk families in Southeast, Central and Southwest Seattle. BPEL directly supported two programs through Neighborhood House – New Holly and Rainier Vista – and one through Atlantic Street Center, which had already begun providing PCHP two years prior to the demonstration project through another funding source. The City of Seattle supported implementation of PCHP by Southwest Youth & Family Services through the Families and Education Levy.

Over the course of the demonstration, these agencies received funding to reach additional families. This included funding for Neighborhood House to provide PCHP to 36 additional families from the Council for Children and Families and funding for Southwest Youth & Family Services to serve 13 Iraqi families from the White Center Early Learning Initiative. We included their results in the overall evaluation to continue better understanding the program's impact and implementation with diverse populations in Seattle.

BPEL supported additional services for families that complemented PCHP's goals and outcomes.

In addition to serving targeted families through implementation of PCHP home visiting with fidelity and high quality, BPEL provided additional supports which were intended to either strengthen the impact of PCHP or provide complementary outcomes for parents and children. These included:

- Investment in Play & Learn Groups for families participating in PCHP through Neighborhood House and Atlantic Street Center. Play & Learn provides opportunities for reinforcement of

⁸ Springs C. (1990). Mother-Child Home Program Results. Union, SC: Union County School Board Fact Sheet.

⁹ Levenstein PI, Levenstein S., Shiminski, J., Stolzberg, J. (1998). Long-term Impact of a Verbal Interaction Program for At-Risk Toddlers: An Exploratory Study of High School Outcomes in a Replication of the Mother-Child Home Program. *Journal of Applied Developmental Psychology* 19(2): 267-285.

¹⁰ http://parent-child.org/assets/Proven_Outcomes/Research_Summaries/PCHP_and_Strengthening_Families_Approach.pdf, downloaded 101210.

Introduction

PCHP (e.g., learning through play, interacting with children, general school readiness), and provides additional benefits to families, such as opportunities for parent social networking and child socialization (i.e., adults have opportunities to connect with other adults and children socialize with peers).

- Additional support for Neighborhood House Home Visitors to provide their immigrant and refugee families with five additional weeks of home visits and materials to teach typical American songs and rhymes that their children would encounter in other early childhood and school settings. BPEL has provided this additional support since 2008.

Since Fall 2008, the Seattle Public Library has partnered with Neighborhood House and Atlantic Street Center to incorporate the Raising A Reader program into the first year of PCHP. Raising A Reader is a “bookbag” program that provides participating families access to two books per week, which they can keep at home before trading them in with the Home Visitor for new books. Families are introduced to the library through the program so that they can continue to access multicultural and developmentally appropriate children’s books after the program ends.

BPEL emphasized evaluation of PCHP in Seattle from the beginning, both in terms of program implementation and impact, and engaged ORS to implement it. This report is comprised of findings across five years of evaluating the demonstration project.

METHODOLOGY

ORS, in coordination with an Evaluation Workgroup of BPEL and representatives from the City of Seattle, created an evaluation plan to collect data on outcomes related to child and parent changes. The evaluation was designed specifically to collect information that could inform funders and funded organizations about the short-term impacts of the program while being culturally sensitive and non-invasive to participating families.

The outcomes evaluation employed the following data collection tools:

- **CBT (Child Behavior Traits) and PACT (Parent and Child Together) observational assessments:** With guidance from ORS and Agency Coordinators, Home Visitors assess children and parents through two observational assessments required by the National Parent-Child Home Program. Home Visitors complete these assessments at three time points: between the fourth and sixth home visit (baseline), and at the end of the first and second years of the program.
- **TROLL (Teacher Rating of Oral Language and Literacy) observational assessment:** With guidance from ORS and Agency Coordinators, Home Visitors assess children on indicators of pre-literacy – including language use, reading and print concepts – at the end of each program year. ORS adapted this tool, with the permission of the developer, to be language neutral and appropriate for a home visit setting.
- **PCHP Parent Interview:** As part of the PCHP program materials, coordinators interview parents about their satisfaction with program participation. ORS added questions to assess other parental changes not reported on the PACT.

The three funded agencies collected and certified all outcome data presented in this report and entered data into the National PCHP Management Information System (MIS), from which ORS accessed assessment and demographic data on families.

To document program implementation, ORS used the following data and information:

- **KEEP (Key Elements for Establishing Program) Form:** Agencies submit the KEEP form to the national office annually to track elements related to program fidelity. National PCHP informs ORS of the status of the implementing agencies based on this form.
- **Documentation of regular meetings with coordinators and supervisors:** ORS meets with PCHP coordinators and supervisors from three implementing agencies in Seattle and representatives from BPEL and the City of Seattle on about a quarterly basis. The group shares successes and challenges related to the implementation of the program and evaluation.
- **Documentation of agency staff meetings:** ORS staff attends agency staff meetings two to three times during the program year. In preparation for this final report, we also conducted focus groups with Home Visitors from each agency during one of the agency staff meetings we attended.

Methodology

- **Interviews with coordinators and supervisors:** In preparation for this final report, ORS staff conducted one-on-one phone interviews with coordinators and supervisors from each implementing agencies in Seattle and representatives from BPEL and the City of Seattle.

In 2007-08, ORS documented elements of the implementation of the demonstration project likely to bear on outcomes, particularly for families with diverse cultural and language backgrounds. In April 2008, ORS compiled these findings into a detailed process evaluation of PCHP/Play & Learn implementation in Seattle. Findings from the process evaluation are summarized in the “Lessons Learned from the Demonstration” section of this report.

Strengths and limitations of the evaluation methodology are discussed below.

Working with Home Visitors to collect observational data helped increase the validity of findings, and ORS and Agency Coordinators provided extensive training and support to ensure data quality.

The evaluation methodology was intended to achieve a balance between collecting rigorous outcomes data on program participants while minimizing the burden of data collection on program staff and families. Reliance on Home Visitors for primary data collection was both a strength and a challenge. Home Visitors are familiar with the family’s culture – most come from the same cultural group and speak the same home language as the families they serve – and they are therefore able to complete the observational assessments with minimal burden to participants and a high degree of sensitivity to the family’s cultural norms, which enhances the validity of evaluation data. Furthermore, Home Visitors are most familiar with participating families (especially as the program progresses) and in the best position to observe changes over time.

However, Home Visitors are not independent evaluation professionals. We therefore took several steps to increase the reliability of observational data. ORS provided support and oversight to ensure data quality, including annual trainings to new and existing Home Visitors on the three observational assessments (CBT, PACT and TROLL) and quality checks on data from the MIS. Agency Coordinators also provided extensive one-on-one supervision and support to Home Visitors to assist with data collection. The consistent training and support provided to Home Visitors gives us confidence in the reliability of evaluation data.

Use of research-based assessment tools that are closely aligned with the model strengthened the methodology, but the tools had some limitations.

The CBT and PACT, designed for PCHP, are both valid, research-based assessment tools administered and scored in a standard manner. They were specifically developed to evaluate the social-emotional status of low-income children age two to four and the positive parent-child interaction behaviors of low-income parent-child dyads, respectively. The TROLL assessment is also a research-based assessment that was adapted to be completed in the family’s home language, although the validity of the adapted tool has not been tested. All three assessments are culturally sensitive and non-invasive to participants.

Neither the CBT nor the adapted TROLL used to collect data on child outcomes has been normed to a representative sample of children, which would permit us to compare children participating in PCHP

Methodology

with a sample of their peers and examine the effects of child development. It is unlikely, however, that such a national sample would accurately represent children participating in PCHP, an extremely large percentage of whom are ethnic minorities and come from immigrant or refugee families. Furthermore, data on the achievement of caregiver outcomes from the PACT provides evidence that caregivers are increasing their use of positive parenting behaviors with children, making a strong case for the viability of concurrent child outcomes.

The evaluation does not include a comparison group because of cost and ethical implications, but the use of a mixed methods approach including both quantitative and qualitative data collection lends strength to findings.

One final limitation of the methodology is that it does not include a comparison group, which would allow us to empirically explore the effects of natural development on achievement of child outcomes. The costs and ethical implications of recruiting a comparison group of families that are not permitted to participate in PCHP were deemed prohibitive by ORS and the funding agencies. Instead, we rely on a mixed methods approach, including multiple sources of both quantitative and qualitative data, to triangulate data and increase our confidence in findings, supplemented by past research studies utilizing experimental and quasi-experimental designs to document the PCHP model's impact. We are also tracking PCHP graduates who enter Seattle Public Schools and will have opportunities in the next couple years to compare their academic achievement with a comparison group of their peers; this effort is described in more detail in the section "Longer-Term Impacts."

IMPLEMENTING PCHP

Agencies are implementing PCHP with fidelity to the evidence-based national model and demonstrating key elements of quality implementation.

When implementing a research-based program, it is important to follow an established protocol. Generally, this includes maintaining specific program elements, providing a minimum level of service and meeting requirements that are integral to a program model. By doing so, agencies can reasonably expect a program to achieve the same results demonstrated by other replications and related research projects. Based on KEEP form data submitted to the National PCHP organization annually and data on the number of home visits completed with families from the PCHP MIS, all three Seattle agencies have implemented PCHP with fidelity. These results are consistent with observations by ORS in its role as evaluator: all programs adhere to the program model, appear to be delivering quality services, and communicate regularly regarding any program implementation or evaluation issues that arise.

Agencies in Seattle continue to demonstrate key elements of quality implementation, discussed at length below in the section “Lessons Learned from the Demonstration.” In particular, agencies retain Home Visitors who share cultural and language backgrounds with target program participants; provide supervision, training and support for Home Visitors to ensure implementation of key elements; and actively participate in the evaluation, which includes meetings to reflect on ways in which program delivery could be enhanced. Consistently high retention rates among staff and program participants provide evidence in support of the Seattle agencies’ quality implementation of PCHP.

Through the Parent-Child Home Program, BPEL reached its target population of ethnically diverse, low-income families.

BPEL established three criteria to guide enrollment in PCHP:

- Family income is below poverty level;¹¹ and
- Children speak a language other than English at home; or
- Children are African American or Native American.

Since Winter 2006 when the program began, 467 families enrolled in Seattle’s Parent-Child Home Program across four completed cohorts. The vast majority of families enrolled in PCHP (99 percent of 467) met at least one of the three criteria for enrollment listed above, and more than four-fifths (82 percent) met the poverty criteria and a second one.

Specifically, almost ninety percent of enrolled families (88 percent) have an income below the 2010 poverty line, almost seventy percent of families (69 percent) speak a language other than English at home, and about one-quarter of families (24 percent) are either African American or Native American. The small number of families that did not meet the criteria (n=5) represent diverse ethnicities – including Asian, Hispanic, and multi-racial – and indicated a native language other than English. **TABLE 1** below shows participant demographic characteristics for PCHP enrollees overall and by cohort.

¹¹ An annual income of \$25,000 is approximately the federal poverty line for a family of five in 2010.

TABLE 1: Percentage of Enrolled Participants with Completion and Demographic Characteristics

Characteristic	Overall (n=467)	Cohort 1 (n=101)	Cohort 2 (n=110)	Cohort 3 (n=139)	Cohort 4 (n=117)
Completion Rate	85	80	86	86	87
Child Gender					
Male	54	60	49	51	58
Female	46	40	51	49	42
Child Ethnicity					
African	25	22	27	23	27
African-American	22	31	22	23	15
American Indian	2	2	0	1	3
Asian	27	17	22	41	24
Hispanic	18	26	21	10	16
Middle Eastern	3	0	0	0	11
Mixed/Biracial	2	0	2	1	3
White	2	1	4	1	1
Home Language					
English	30	34	32	30	26
Non-English ¹²	70	62	68	70	74
African Language ¹³	25	22	27	23	27
Arabic	3	0	0	0	12
East Asian Language ¹⁴	24	17	21	35	22
Spanish	16	26	1	10	14
Family Income					
<\$10,000/year	43	52	51	32	40
\$10-15,000	25	19	25	33	22
\$15-25,000 ¹⁵	20	24	11	22	22
\$25-35,000	9	2	8	12	12
\$35-45,000	3	0	5	1	3
Participating Caregiver					
Mother	88	86	89	90	87
Father	3	2	3	4	3
FFN ¹⁶	6	8	4	4	9
Parent Status					
Teen Parent	10	14	10	9	9
Single Parent	35	49	32	36	26
Number of Siblings					
0	34	28	35	37	36
1-2	48	50	50	45	49
3+ ¹⁷	18	22	16	18	15

¹² Language and ethnicity are highly correlated. Analyses in this report do not distinguish between various non-English languages as these differences are captured in comparisons by ethnic group.

¹³ The most common African language is Somali (83% of all speakers of African languages across cohorts), followed by Oromo (4%), Tigrinya (4%) and Amharic (4%).

¹⁴ The most common Asian language is Vietnamese (40% of all speakers of East Asian languages across cohorts), followed by Cambodian (27%), Cantonese (19%) and Cham (13%).

¹⁵ An annual income of \$25,000 is approximately the federal poverty line for a family of five in 2010.

¹⁶ FFN refers to Family, Friend & Neighbor caregivers (i.e., not the mother or father). Participating FFN are most often grandparents and occasionally other relatives such as aunts.

The vast majority of families enrolled in PCHP in Seattle completed both years of the program.

TABLE 1 also shows the completion rate for enrolled families. Overall, 85 percent of enrolled families completed both years of the program, and this rate has been increasing over time, particularly following the trial and error and abbreviated recruitment period of the first cohort. Excluding the first cohort, the completion rate is 87 percent.¹⁸ According to Program Coordinators, most of the families who did not complete the program moved away, outside of the service area or even out of the country. This was especially true for Hispanic immigrant families, many of whom are forced to return to their home country because of loss of employment and lack of other opportunities.

A total of 69 families enrolled in PCHP but did not complete both years of the program. African American and Hispanic families were least likely to graduate from the program (about 16 percent of each group left the program prior to completion) while Asian and African families were most likely to graduate (11 to 12 percent did not graduate). No other participant characteristics appeared to have a significant impact on program completion rates.

We compared PCHP's completion rate with those of other multi-year, evidence-based home visiting programs to provide additional context. In 2010, according to the Washington State Home Visiting Coalition, the completion rate for the Nurse Family Partnership (NFP) program was 60 percent in Washington State. For the Parents As Teachers (PAT) program, the completion rate was 84 percent nationally. Overall, completion rates for PCHP in Seattle (85 percent) are on the high end of these rates. It is important to note, however, that requirements for program completion and methods for measuring and tracking attrition differ by program, which limits comparability.

A small number of caregivers enrolled in PCHP more than one time because they demonstrated need for additional support.

Across five years of PCHP implementation in Seattle, just ten families enrolled a second time after completing the two-year program because they demonstrated need for additional modeling and support, in addition to other reasons. According to BPEL guidelines, families were permitted to re-enroll in PCHP if they were at-risk, not able or willing to enroll in another program, and demonstrated all or most of the following criteria: large number of children; family is overwhelmed and has extreme lack of control of children; family has siblings that are not enrolled in other programs; evident stress in family, e.g., mental health issues; isolation; low family literacy in first language and English; single parent family.

At the end of their first cycle through the program, these ten caregivers scored lower than average on the PACT, attaining an average score of 3.49 compared to 3.63 among all other families (n=378). However, after their second cycle, these families attained an average PACT score of 3.58 and closed the gap with other families. Neither difference was statistically significant, not surprising given the very small number of families that completed PCHP twice.

¹⁷ Across cohorts, 9% of families have three children in addition to the child enrolled in PCHP; 5% have four additional children; 2% have five; and 2% have six or more, up to a maximum of 10 additional children.

¹⁸ Among families completing the program, all received at least 46 home visits each year. Many Neighborhood House participants received ten extra home visits in addition to the standard 46.

IMPACT ON CAREGIVERS

PCHP intends to change behaviors of both adults and children through their interactions with the Home Visitor. Expected caregiver outcomes include the following:

- Enhanced interactions between caregivers and children related to showing affection;
- Increased use of positive parenting behaviors related to verbalizing directions.

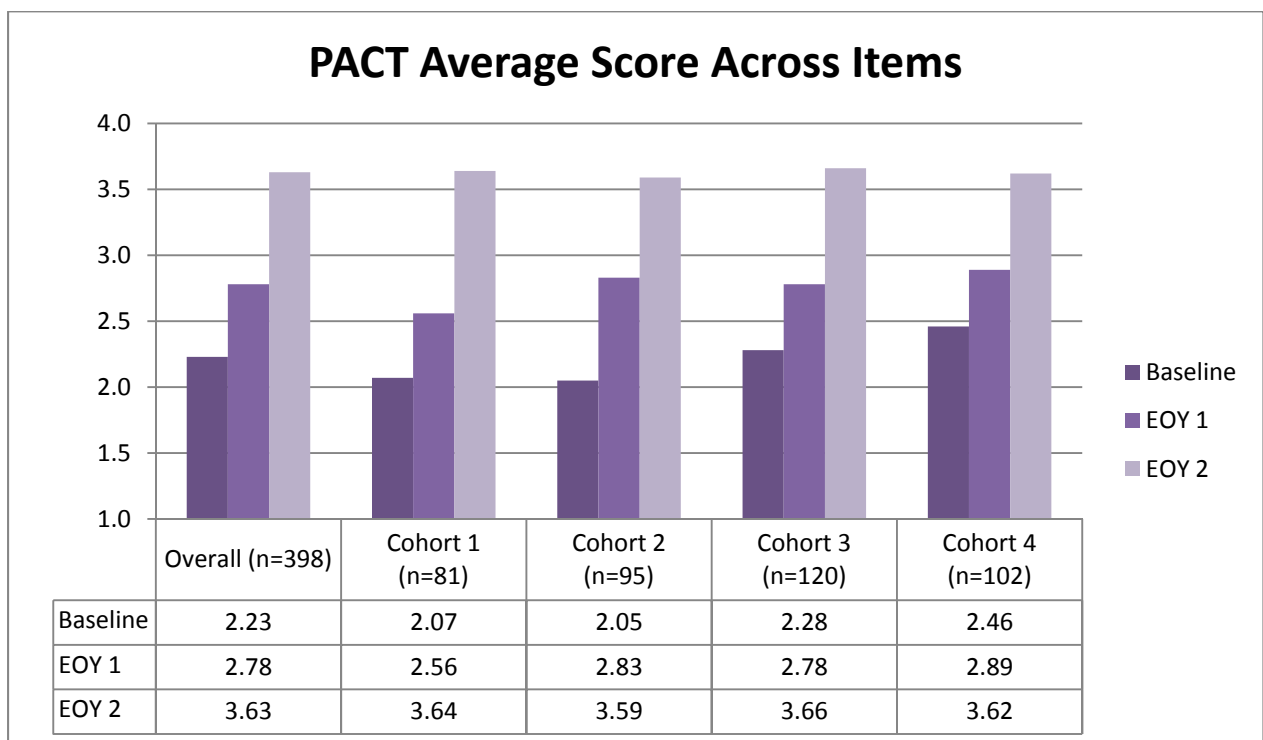
To assess changes in these areas, Home Visitors completed an observational assessment of the frequency of 20 positive caregiver behaviors and interactions with children called the Parent And Child Together (PACT). This assessment was completed at three time points during the two-year program: at baseline, end of the first year, and end of the second year.

The PACT includes items such as “Parent tries to converse with child”, “Parent verbalizes approval of the child”, and “Parent is persistent and consistent in enforcing directions”, rated on a four-point scale that includes “never”, “sometimes”, “most of the time” and “always.” Home Visitors also conducted brief interviews with participating caregivers at the end of the program year.

Between each time point, caregivers exhibited statistically significant increases in the frequency of positive behaviors and interactions on all PACT items and on an average score across items, providing strong and consistent evidence of enhanced caregiver-child interactions and increases in caregivers' use of positive parenting behaviors as a result of the program.

This was true for PCHP graduates overall as well as for each of four graduated cohorts, as shown in **FIGURE 1**. **APPENDIX A** also includes item-by-item scores at each time point for each cohort.

FIGURE 1: PACT Average Score Across Items¹⁹



On average, at the start of PCHP, caregivers demonstrated positive parenting behaviors between “sometimes” and “most of the time.” Caregivers increased this frequency to closer to “most of the time” by the end of the first year, and by the end of the program, they were exhibiting positive parenting behaviors almost “always.” The frequency of positive parenting behaviors increased markedly between the end of the first and second program years, providing strong evidence for the necessity of the second year of the program to instill parenting skills.

¹⁹ Items are rated on a four-point scale, including Never (1), Sometimes (2), Most of the time (3), and Always (4), at three time points: baseline, end of year one (EOY 1) and end of year two (EOY 2). The average score across items accounts for 18 of 20 PACT items. The two items removed include #5 because of frequent misinterpretation for the first and second cohort, and #3 because of a large amount of missing data for this item. Reliability > 0.8.

Impact on Caregivers

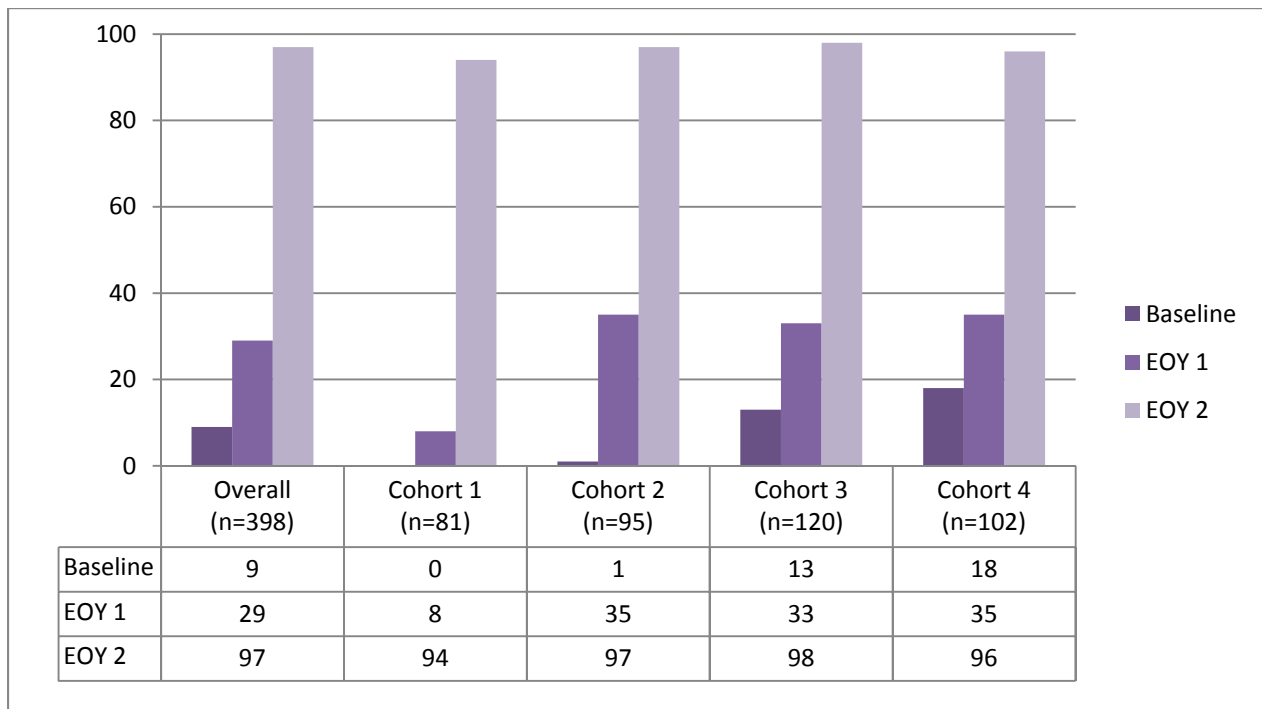
Caregivers showed consistent growth across all 20 PACT items from baseline to the end of the program. Items with notably high increases in average scores from baseline to end of year two (i.e., average change scores of 1.5 points or more on a four-point scale) include:

- Parent provides a verbal rationale for obedience
- Parent listens to child’s reaction to a directive and reacts appropriately
- Parent tries to converse with child
- Parent explains rationale for directions and expectations
- Parent trains child to perform age-appropriate activities (e.g., shows child how to stack blocks, put blocks away when finished)

By the end of the second year of the program, over 90 percent of caregivers exhibited positive parenting behaviors and interactions with an average frequency of “most of the time” or greater.

We analyzed the results of PACT scores in a slightly different way to identify the percentage of caregivers with an average PACT score of three or greater across items, as shown in **FIGURE 2**.

FIGURE 2: Percentage of Caregivers Attaining PACT Average Score of 3 or Greater



At baseline, a very small percentage of caregivers demonstrated positive behaviors at least “most of the time” on average, although this percentage has been increasing with each consecutive cohort. At the end of the first year, about a third of participating caregivers reached this threshold (with the exception of Cohort 1). By the end of the program, the vast majority (90 percent and above) reached this threshold and were using these positive behaviors with their children on a regular basis.

Caregivers entered the program with stronger average ratings on PACT items related to “showing affection” than on items related to “verbalizing directions.” In both areas, caregivers significantly increased their ratings and ended the program with high scores.

We divided the PACT into two subscales to further examine growth in caregivers’ parenting skills. These subscales include items related to “Showing Affection”²⁰ and “Verbalizing Directions.”²¹ The same pattern of statistically significant increases in the frequency of positive behaviors described above (i.e., across time points and cohorts) held true for each of these subscales. Average scores for each of these subscales are displayed in **FIGURES 3 and 4** below.

Average scores were slightly higher at all three time points for the “Showing Affection” subscale compared with “Verbalizing Directions.” Behaviors measured by the latter subscale might take more time and effort to develop. This is consistent with findings shared with us by another researcher, who noted that Home Visitors begin to actively encourage and model more advanced behaviors, such as those related to verbalizing directions, in the second year of PCHP.²² Given the strong links between parent’s verbal interactions and child outcomes, it will be important for Home Visitors to continue to focus on building parent’s verbal interaction skills throughout the program.

²⁰ This subscale consists of six PACT items related to the parent’s showing warmth, affection and approval; items include #4, 8, 10, 14, 16, 20; e.g., “Parent comforts child”. Reliability > 0.8.

²¹ This subscale consists of 12 PACT items related to the parent’s verbalizing and enforcing directions and expectations; items include #1, 2, 6, 7, 9, 11, 12, 13, 15, 17, 18, 19; e.g., “Parent gives directions and encourages child to follow them” and “Parent provides a verbal rationale for obedience”. Reliability > 0.8.

²² Personal communication with Prof. Patricia Manz of Lehigh University, who is studying the impact of PCHP in Philadelphia.

FIGURE 3: PACT Average Score: Showing Affection Subscale²³

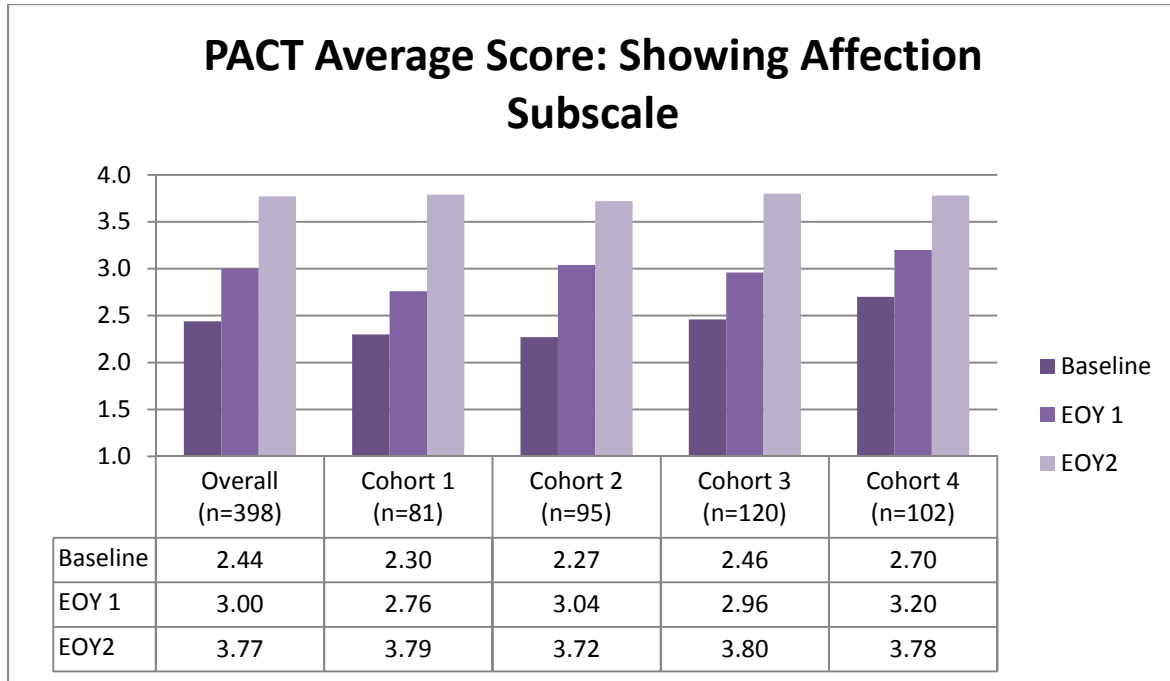
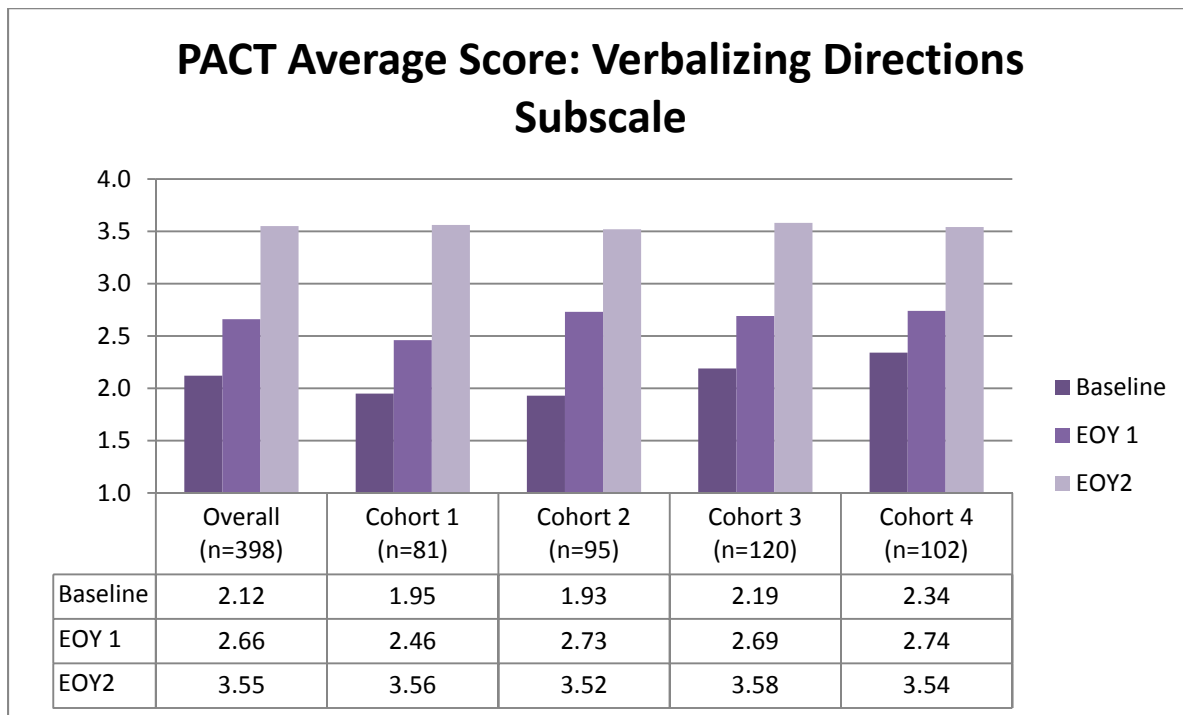


FIGURE 4: PACT Average Score: Verbalizing Directions Subscale



²³ Items are rated on a four-point scale including Never (1), Sometimes (2), Most of the time (3), and Always (4).

Caregivers completing PCHP in Seattle performed better than their counterparts from other PCHP sites nationwide on the PACT.

National PCHP provided ORS with assessment data from other sites for comparison purposes.²⁴ ORS received PACT assessment data for 89 families from two PCHP replication sites in Brooklyn and Queens, NY, for the 2009-10 program year. These sites were chosen because their participants are comparable to Seattle's in terms of income and similarly diverse in terms of ethnicity and language. More than half of the participants from these sites are Hispanic (53 percent), the majority of whom speak Spanish as their primary language, and most of the remaining children are African American (43 percent).²⁵ Seattle PCHP participants received average PACT scores that were significantly higher than those of their counterparts from other sites at both baseline (2.26 vs. 1.99) and end of year two (3.63 vs. 3.20). Seattle participants also scored significantly higher in terms of their average change in PACT scores across the two-year program (1.40 in Seattle, compared with 1.20 in Brooklyn and Queens).

Through interviews, caregivers explained that they are more engaged with their child and better able to support their child's school readiness as a result of PCHP.

At the end of each program year, PCHP Coordinators and Home Visitors completed interviews with participating caregivers to further document changes in parent-child interactions and parenting behaviors. Through several open-ended questions, caregivers were asked to reflect on and share their perspectives about changes they may have experienced as a result of PCHP. In Spring 2010, the funded agencies completed interviews with 100 caregivers from Cohort 4 (out of 102, a 98 percent response rate). Key themes from these interviews are described below.²⁶

When asked about what caregivers do differently now compared with before they started participating in PCHP, caregivers said that they engage more with their child, including asking more questions, listening and speaking to the child more, engaging in conversations, and reading and playing.

I never read the book to my son. I never play or talk to him. Before I never went and learn about the school of my children. Now I am going and asking and helping them.

I have realized that the more time I spend playing with the toys and books the program provides, the better prepared my child will be.

I really didn't know what to do before this program. Now I know how to participate and listen the story and I learn how to play with him.

Caregivers also reported that they have begun new activities designed to prepare their child for school (e.g. schedule story time, family reading time, play and learn, etc.).

²⁴ ORS cannot verify the quality of data obtained from other PCHP sites.

²⁵ It is important to note that the Seattle sites were composed of diverse immigrant groups, compared to the majority Hispanic New York sites. It is unclear how this difference in composition of non-native English-speaking participants might have affected performance.

²⁶ Interviews with caregivers from previous cohorts identified similar themes and are summarized in annual evaluation reports prepared for BPEL by ORS from 2007-2009. Because interview questions changed from year to year, they could not be combined for meta-analysis.

Impact on Caregivers

We look for different activities for her to participate in and we seek out more educational types of games to use as fun ways to learn.

Caregivers also mentioned other changes, such as reducing the amount of time their child is permitted to watch television, having better access to resources such as books at home and library offerings, and learning parenting practices that they can use with other children in their home.

Next, caregivers described any changes they perceived in their ability to help their child learn and be ready for school since participating in PCHP. Caregivers said they are better able to support their child because they know how to teach their child (e.g., to read and play), have a better understanding of the expectations for school, and view themselves as the child's advocate and first teacher. Caregivers also expressed confidence and excitement about staying involved in their child's development and learning.

I feel really good. I know what I am doing to help my child to be ready to go the school.

When asked what other kinds of changes they have experienced from participating in PCHP, caregivers commented that their children are more ready for school because they can sit and listen and follow instruction, and they are more capable of and interested in reading and learning (e.g., able to identify shapes and colors).

I feel PCHP program is very helpful. That helped my child learn a lot, shapes, colors, number, name animals. And how to talk too. I think my child will be ready go to school.

Program staff felt similarly about children's growth and school readiness. In the words of one Agency Coordinator:

When you witness the changes in the children and families, it is just so powerful. It's silly to say it, but on the outside the program looks so simple: you go into the home two times a week, thirty minutes a visit, and other people outside say, 'You can't change [a child] in an hour a week.' We don't change that child in an hour a week; that child has a book and he goes, 'Read this to me.' He has a toy that he wants to interact with his parents and siblings. It's so simple on the outside but it's really so profound. I think that was my biggest 'aha' with this... I think that these children are ready to learn, they are ready to go to school, they can sit still, they know how to hold a book. I think that has to be the most important thing.

Program staff report that caregivers became more hands-on with their children over the course of the program and increasingly recognized that children start learning at birth.

Agency Coordinators and Home Visitors reported that many families began PCHP with the belief that children start to learn when they enter school and that it is the school's responsibility to educate the child. As a result of seeing the growth in their young children (at times compared to older siblings who may be struggling in school) and observing the Home Visitor, caregivers began to identify themselves as "the child's first teacher."²⁷ As a result, caregivers ask more questions about early learning, spend more

²⁷ This finding was echoed by caregivers themselves through interviews summarized in previous years' evaluation reports.

Impact on Caregivers

time reading with their children, allow the child to initiate and lead activities, and set up bookshelves and space in their homes specifically for children to play and read.

In many cases, this shift in attitude also extends to fathers and other relatives, even if they do not actively participate in the program. Program staff reports that many fathers became more involved in the program as it progressed, especially as their children showed them the book or toy and asked them to read or play. Indeed, through interviews, caregivers said that they noticed other family members, especially fathers, engaging more often with the child.

Now my husband read more with my son. We spend more time together.

My family has been changing to be my child's teacher.

In addition to these changes, program staff felt that caregivers become better at following a schedule and routine of biweekly home visits and informing the Home Visitor in advance when they need to reschedule a visit.

IMPACT ON CHILDREN

PCHP intends to impact children on the following outcomes:

- Improved child behaviors related to social-emotional development and self-regulation skills;
- Increased pre-literacy skills.

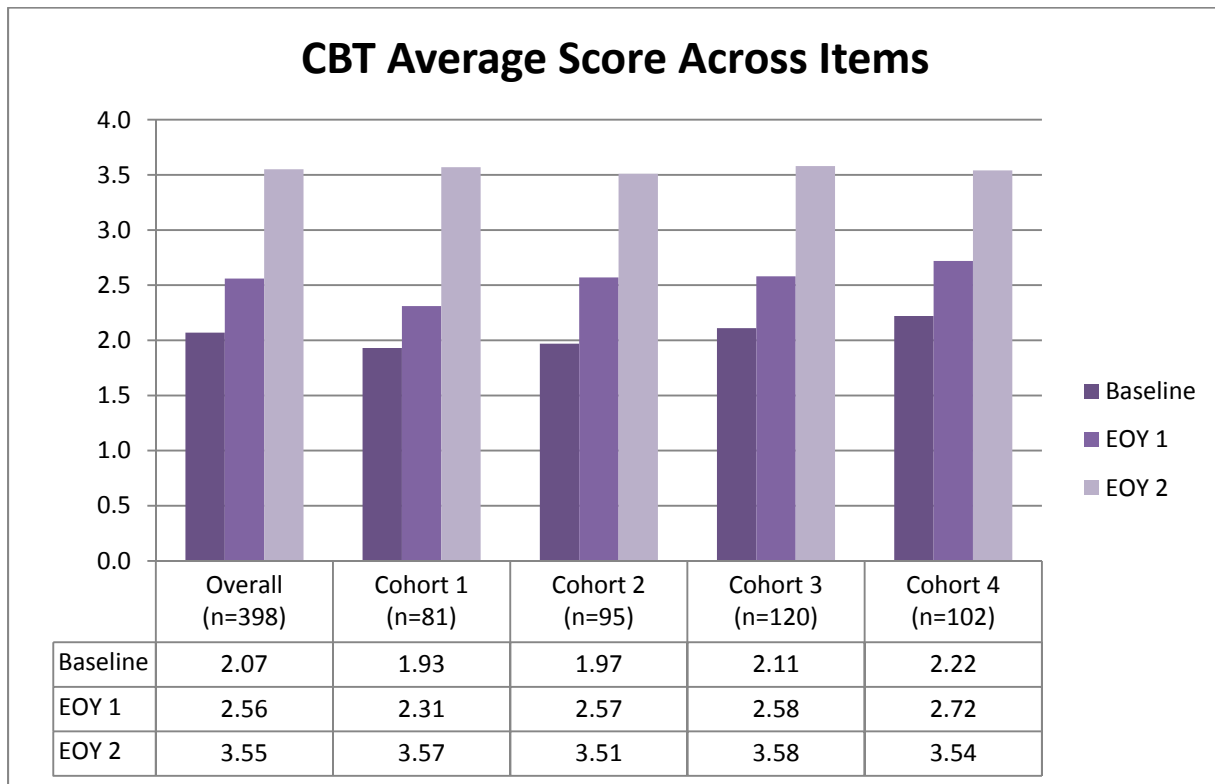
To assess changes in child social-emotional development and self-regulation skills, Home Visitors completed an observational assessment of the frequency of 20 positive child behaviors, called the Child Behavior Traits (CBT). This assessment is administered at three time points during the two-year program: at baseline, end of the first year, and end of the second year.

The CBT includes items such as “Attentive and concentrates on activities for up to three minutes” and “Is creative and inventive during playtime activities”, which are rated on a four-point scale that includes “never”, “sometimes”, “most of the time” and “always”.

Between each time point, children exhibited statistically significant increases in the frequency of positive behaviors on all CBT items and on an average score across items, providing strong and consistent evidence of increases in children’s social-emotional development and self-regulation skills.

This was true for PCHP graduates overall as well as for each of four graduated cohorts, as shown in **FIGURE 5**. **APPENDIX A** also includes item-by-item scores at each time point and for each cohort.

FIGURE 5: CBT Average Score Across Items²⁸



On average, at the start of PCHP, children demonstrated positive behaviors “sometimes.” Children increased this frequency to closer to “most of the time” by the end of the first year, and by the end of the program, they were exhibiting positive behaviors almost “always.” The frequency of positive child behaviors increased markedly between the end of the first and second program years, providing strong evidence for the necessity of the second year of the program to fortify gains in child behavior.

²⁸ Items are rated on a four-point scale, including Never (1), Sometimes (2), Most of the time (3), and Always (4), at three time points: baseline, end of year one (EOY 1) and end of year two (EOY 2). The average score across items accounts for 18 of 20 CBT items, rated on a scale of Never (1), Sometimes (2), Most of the time (3), and Always (4). The two items removed include #3 because of frequent misinterpretation for the first and second cohort, and #18 because of a large amount of missing data for this item. Reliability > 0.8. A factor analysis revealed no subscales for this assessment.

Impact on Children

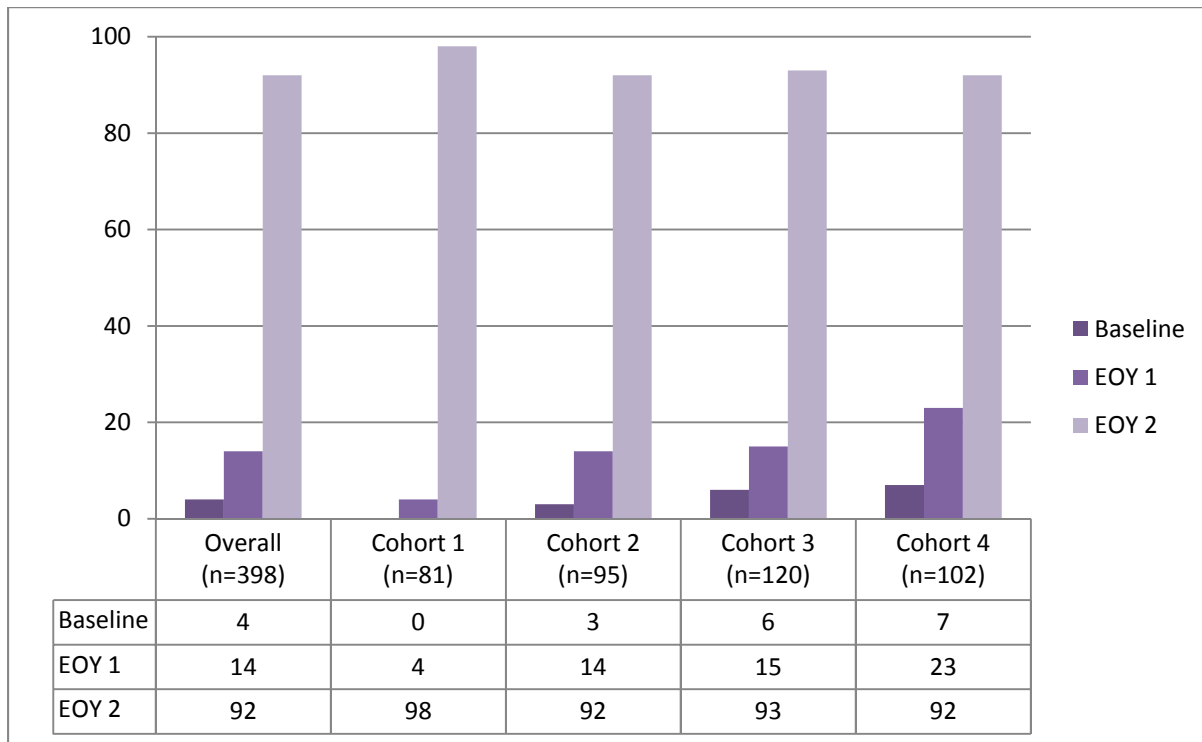
Children showed consistent growth across all 20 CBT items from baseline to the end of the program. Items with notably high increases in average scores from baseline to end of year two (i.e., average change scores of 1.5 points or more on a four-point scale) include:

- Understands and completes activities that are developmentally appropriate (e.g., makes a puzzle, builds with blocks, etc.)
- Can describe in words or sentences the pictures in a book
- Participates in pretend playtime activities (e.g., pouring pretend milk)
- Is creative and inventive during playtime activities
- Initiates positive activities (e.g., builds with blocks, sings a song, plays with a toy on her own)

By the end of the second year of the program, over 90 percent of participating children exhibited positive behaviors with an average frequency of “most of the time” or greater.

We analyzed the results of CBT scores in a slightly different way to identify the percentage of children with an average CBT score of three or higher across items, as shown in **FIGURE 6**. At baseline, a very small percentage of children demonstrated positive behaviors at least “most of the time” on average. At the end of the first year, about an eighth of participating children reached this threshold, and the percentage seems to be increasing with each consecutive cohort, perhaps a result of increases in Home Visitors’ skills over time. By the end of the program, the vast majority (90 percent and above) reached this threshold and were exhibiting these positive behaviors on a regular basis.

FIGURE 6: Percentage of Children Attaining CBT Average Score of 3 or Greater



To explore changes in children’s pre-literacy skills as a result of PCHP, Home Visitors completed an additional observational assessment of children called the Adaptation of the Teacher Rating of Oral Literacy and Language (TROLL) at two time points: end of the first and second years.²⁹ The developers of the original TROLL assessment identified three subscales (Language Use, Reading, and Print Concepts) for which we computed average scores in addition to the average score across all items.

The Language Use subscale includes items such as “How clearly and logically does the child communicate things that he or she sees or experiences?” and “How often does the child try out new words?” The Reading subscale includes items such as “How much does the child like to hear books read?” and “Can the child recognize printed letters (English and/or home language)?” And the Print Concepts subscale includes items such as “Does the child recognize the front and the back of a book?” and “Does the child turn the pages in a book a single page at a time?”

Between the end of the first and second years of the program, children exhibited statistically significant increases in ratings of their pre-literacy skills on TROLL items.

There is no single definition for TROLL scores because rating scales differ by TROLL item; however, the results clearly demonstrate a significant increase in pre-literacy skills across time for participating children on all TROLL items that were common at both time points and on comparable total and subscale average scores.³⁰ This was true for PCHP graduates overall as well as for each of four graduated cohorts, as shown in **TABLE 2. APPENDIX A** also includes item-by-item scores at each time point and for each cohort.

TABLE 2: TROLL Average Scores for All Common Items and Subscales at Two Time Points³¹

Cohort	Average Score Across All Items		Language Use Subscale		Reading Subscale		Print Concepts Subscale	
	EOY1	EOY2	EOY1	EOY2	EOY1	EOY2	EOY1	EOY2
Overall (n=317)	2.71	3.55	2.62	3.55	2.57	3.37	3.11	3.90
Cohort 2 (n=95)	2.68	3.51	2.59	3.47	2.52	3.33	3.09	3.87
Cohort 3 (n=120)	2.71	3.65	2.63	3.65	2.59	3.47	3.07	3.93
Cohort 4 (n=102)	2.75	3.47	2.65	3.39	2.58	3.28	3.18	3.90

²⁹There are two versions of the TROLL, one for use at the end of year 1 (EOY1) containing 13 items and one for use at the end of year 2 (EOY2) containing the same 13 items plus an additional 8 items which are most developmentally relevant for children between three and four years of age (i.e., items addressing letter, number and word recognition). Because the TROLL pre-literacy assessment is intended for children ages three to five, the first assessment is done at the end of the first program year. For Cohort 1, the TROLL assessment was only completed at the end of year 2.

³⁰ Nine of the 13 common TROLL items are rated on a frequency scale that includes “Never”, “Rarely”, “Sometimes” and “Often.” The other four common items have unique scales, which are listed in **APPENDIX A**.

³¹ All changes between EOY 1 and EOY 2 are statistically significant; $p < .05$.

It's interesting to note that children scored highest at both time points on the Print Concepts items. It appears that children came into the program with a more developed skill set in this area compared with Language Use and Reading, even though there is evidence to suggest that a large portion of participating families lacked books in their home prior to PCHP. Because the Adapted TROLL is not normed to a national sample, we cannot say whether these scores are on par with non-participating children in a similar age range.

Children completing PCHP in Seattle performed better than their counterparts from other PCHP sites nationwide on the CBT and “caught up” with and exceeded their counterparts on the TROLL over the course of the program.

As discussed above in relation to caregiver outcomes, National PCHP provided ORS with assessment data for 89 families from replication sites in Brooklyn and Queens, NY for comparison purposes.³² These sites' participants showed some similarities to Seattle's in terms of income, ethnicity and language, although the Seattle sites included greater diversity of participants in terms of languages and ethnicities. Seattle PCHP participants received average CBT scores that were significantly higher than those of their counterparts from other sites at both baseline (2.07 vs. 1.83) and end of year two (3.55 vs. 3.26). However, their average change in CBT scores across the two-year program was roughly the same (1.48 in Seattle, compared with 1.43 in Brooklyn and Queens).

We also received TROLL data for 438 children at either or both time points (i.e., end of the first and second program year) from other PCHP replication sites in Pennsylvania, California and Massachusetts that implemented the assessment in the 2007-08 program year. A demographic comparison of the sites revealed notable differences: over half of children from PCHP comparison sites (53 percent) are White, four-fifths (80 percent) speak English as their primary language, and more than a third (35 percent) have an income above the poverty line. Children from other sites received significantly higher average TROLL scores at the end of year one than their counterparts in Seattle (2.99 vs. 2.71), as well as on all three TROLL subscales. However, at the end of year two, the pattern was reversed: Seattle PCHP children scored significantly higher than children from other sites on common TROLL items (3.49 vs. 3.36) and on two of three subscales, excluding Language Use.

Previous research studies linked positive parenting behaviors to child outcomes and demonstrated the PCHP model's longer-term impact on children. These findings support the claim that the child outcomes documented in this report are in part attributable to PCHP.

As discussed above in the “Methodology” section, we cannot speak definitively about the extent to which natural child development was a factor in the program's achievement of child outcomes for two reasons: 1) the CBT and Adapted TROLL are not normed to a national sample; and 2) the evaluation methodology did not include a comparison group for ethical and cost reasons. However, previous studies of PCHP programs around the country directly linked positive parenting behaviors and parent-child interactions measured by the PACT to achievement of child outcomes and demonstrated the model's longer-term impact on children in terms of increased cognitive skills, academic achievement

³² ORS cannot verify the quality of data obtained from other PCHP sites.

Impact on Children

and high school graduation rates. These previous research findings were summarized in the “Introduction” section above. The past research and the strong implementation of the model in Seattle give us confidence that the child outcomes described above are in part, if not entirely, a result of participation in PCHP.

IMPACT ON FAMILIES

We identified some additional impacts experienced by participating families as a result of the program, in addition to the prioritized outcomes described previously. These impacts are related to increases in families' participation in activities outside of the home, particularly complementary services promoted by program staff, and the benefits families experienced as a result of these activities.

PCHP participants had the opportunity to participate in several services that are complementary to PCHP, including (1) Play & Learn Groups for participants from Atlantic Street Center and Neighborhood House, (2) additional home visits focusing on traditional American preschool and school activities for Neighborhood House families and (3) the Raising A Reader program implemented during the first year of PCHP by Neighborhood House and Atlantic Street Center with support from the Seattle Public Library.

The Seattle agencies implementing PCHP also coordinate several other activities in the spring and summer, including graduation ceremonies for PCHP (for Program 2 families) and Raising A Reader (for Program 1), "fairs" to connect families with preschool programs or resources like health services, and group trips to community venues such as libraries and parks. These activities are intended to keep families connected to the Home Visitor and the program, provide opportunities to refer families to additional community services and celebrate their achievements.³³

Caregivers reported that their family began new activities outside of the home since participating in PCHP, particularly activities at the library and Play & Learn groups. They felt that these activities support their children's socialization and learning.

Through interviews, caregivers were asked about any new activities they've begun outside of the home with their child since participating in PCHP. Seventy-one percent of Cohort 4 caregivers (71 of 102) responded to this specific line of questioning. More than two-thirds of caregivers who responded to the questions (69 percent) reported that they had begun new activities, while just over one-quarter (28 percent) had not. Among those who started new activities (n=49), caregivers listed activities at the library, Play & Learn, and activities at a park or playground. Frequency of participation in these new activities ranged from weekly to a few times a month.

When asked why they started doing these new activities, caregivers felt the activities benefitted the socialization of their child by helping him or her make friends, interact with others and get outside of the house; helped their child learn; and promoted their child's health and athletic ability. Several caregivers specifically mentioned that their Home Visitor referred them to the new activity.

Caregivers were also asked to identify any barriers or challenges to participating in new activities outside the home. They identified lack of transportation, e.g., because they lack a car and/or the bus is impractical for them; that their family is too large for them to participate in new or additional activities; lack of time, especially because of their work or full-time schooling; and that their child is already involved in enough activities.

³³ The evaluation has not specifically looked at the impact of summer activities, which vary by agency, year and amount of family participation.

Caregivers are accessing additional resources and services for their families and becoming more empowered and involved in all of their children's education as a result of PCHP.

According to interviews with Agency Coordinators and focus groups with Home Visitors, families are accessing additional services through the implementing agencies, particularly for assistance with basic needs such as food and clothing but also including other services like early learning programs and even medical appointments. Referrals to these services happen in several different ways: Home Visitors might tell families about these services directly and answer their questions, get in touch with the Agency Coordinator to refer them, and/or contact other staff members at the agency, such as "family advocates," to assist families. While this creates some burden on Home Visitors because of the time involved in making referrals, most welcome the opportunity to build rapport with the family, and Agency Coordinators try to assume this responsibility as much as possible.

Program staff also reported that PCHP families are increasingly involved in the education of their children of all ages, in terms of transitioning their PCHP-age children into preschool programs (discussed at length in the section "Longer-Term Impact"), supporting younger children's development, and becoming active in their older children's schools. For example, one PCHP parent joined the board of the implementing agency, and several others joined Parent Teacher Associations to advocate for their children. As another example of the empowerment participating caregivers experience, two parents became PCHP Home Visitors after they completed the program.

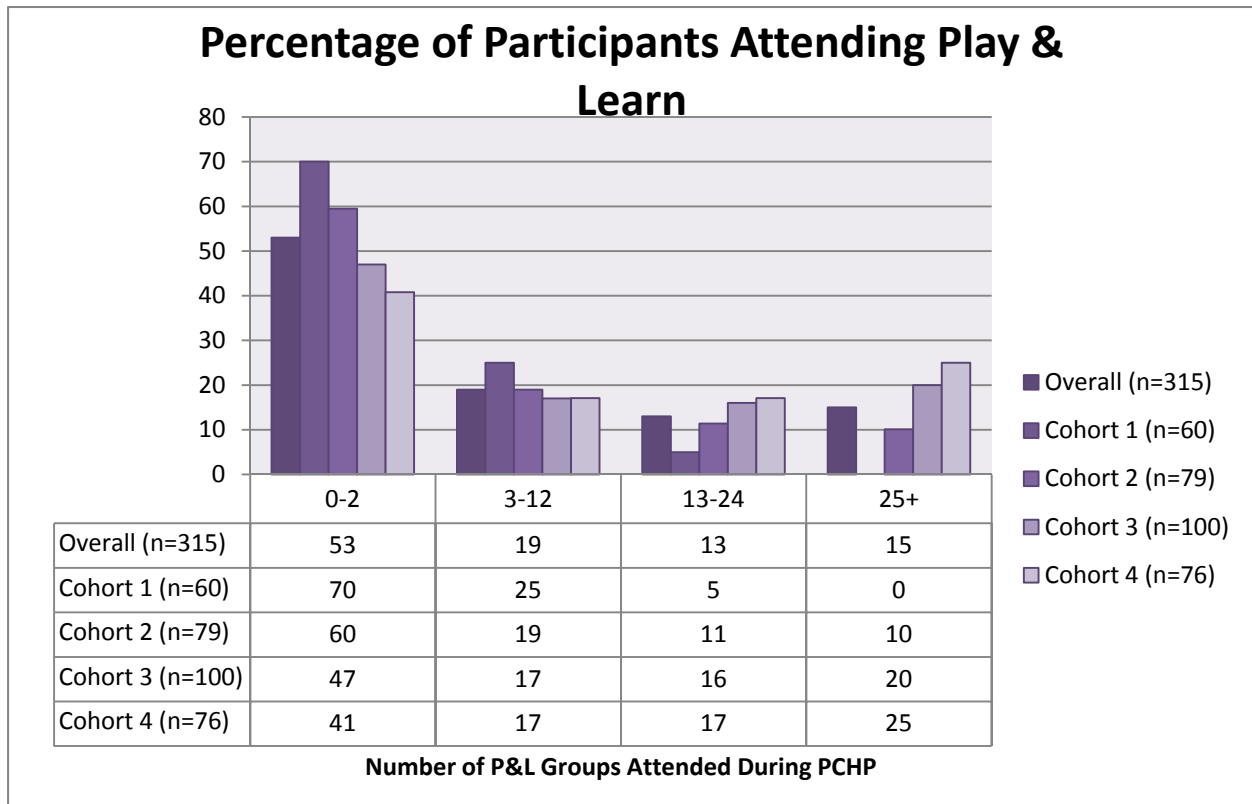
Attendance at Play & Learn Groups increased across cohorts as agencies became more intentional about encouraging their families to attend and groups became more popular.

BPEL-funded organizations encourage PCHP families to participate in Play & Learn Groups. BPEL anticipates that families will benefit from participating in both PCHP and Play & Learn in two ways: (1) Play & Learn provides additional opportunities for reinforcement of PCHP (e.g., learning through play, interacting with children, general school readiness), and (2) Play & Learn provides additional benefits to families, such as opportunities for parent social networking and child socialization (i.e., adults have opportunities to connect with other adults and children can socialize with peers).

Impact on Families

Trends in Play & Learn attendance across cohorts are presented below in **FIGURE 7**. Across all four graduated cohorts, almost half of program graduates (47 percent) attended a Play & Learn group at least three times during the two years of the program.³⁴ The percentage of “low-range” attendees (i.e., 3 to 12 times over two years) was consistent at about one-fifth across the four cohorts. However, the percentage of participants attending Play & Learn between 13 and 24 times and at least 25 times over two years increased dramatically from one year to the next.

FIGURE 7: Percentage of Participants Attending Play & Learn



Immigrant families, particularly those of African and Asian ethnicity, and families with an income above the poverty line were most likely to attend Play & Learn at least three times. This may be because one agency in particular that serves a large proportion of African and Asian families has devoted a significant amount of time and resources toward improving its Play & Learn Group and promoting it to participating families. Furthermore, families with relatively higher incomes may be less challenged by time and transportation constraints that prevent extremely low-income families from participating in additional programs outside the home.

³⁴ These figures include two of the three agencies implementing PCHP: Neighborhood House and Atlantic Street Center. Southwest Youth & Family Services, funded by the City of Seattle, did not collect data on Play & Learn attendance because they did not host a group.

Families who attend Play & Learn indicated that the program provides benefits including positive changes in parents' social networks as well as in children's socialization and school readiness.

Through interviews conducted with past cohorts, caregivers identified benefits of attending Play & Learn with their children such as increased opportunities for both caregivers and children to connect with peers and develop friendships as well as for children to learn and experience a school setting.³⁵ Program staff had similar feelings about the benefits of Play & Learn. For example:

The kids feel a sense of community, like they were part of a group, like they were part of something... And the families didn't even know each other. They don't even speak the same language, but the kids are all friends. They play with each other, even when they can't talk with each other. (Agency Coordinator)

Seattle Public Library's evaluation of Raising A Reader found that participating families spent more time reading together and increased their connection to the library as a result of the program.

Beginning in Fall 2008, the Seattle Public Library and two of the three agencies implementing PCHP in Seattle – Neighborhood House and Atlantic Street Center – partnered to incorporate the Raising A Reader program into the first year of PCHP (starting with Cohort 4). Raising A Reader is a “bookbag” program that provides participating families access to two books per week which they can keep at home before trading in for new books. PCHP coordinators and Home Visitors are trained by the Seattle Public Library in modeling parenting behaviors that will increase children's pre-literacy skills. Families are introduced to the library through the program so that they can continue to access multicultural and developmentally appropriate children's books after the program ends.

A separate evaluation of Raising A Reader with PCHP participants was conducted by the Seattle Public Library in 2008-09 and again in 2009-10. Through pre- and post-surveys of participating families in Cohorts 4 and 5, the evaluation found statistically significant increases in the following: frequency and amount of time families spent looking at books at home (often initiated by the child), presence of an established routine for book sharing, involvement of the caregiver while looking at books with children (e.g., asking the child questions about the story), frequency of library visits, and type of activities done while at the library.³⁶

Agency Coordinators reported that families like the program and the books they received and seem to visit the library more often. They noted that families often lost or damaged books at the beginning of the program, but by the end of the year they seemed to have learned how to handle and borrow books. Coordinators felt that this would help families access books at the local library beyond PCHP.

³⁵ Questions inquiring about the benefits of Play & Learn were not included in this year's interviews with caregivers.

³⁶ The Seattle Public Library & Raising A Reader. (2010). *Evaluating the Impact of Raising A Reader*. Seattle, WA. See Appendix 1 for detailed findings for PCHP.

Caregivers participating in additional home visits to learn typical American preschool and school activities found the extra visits to be helpful for preparing their children for preschool.

At the end of the 2006-07 program year, PCHP families served by Neighborhood House requested that Home Visitors spend time teaching both parents and children typical English-language rhymes and songs. Hailing from diverse language and cultural backgrounds, caregivers realized they did not know – and therefore could not teach – their children the typical rhymes and songs that are used in early learning group experiences such as Play & Learn groups, preschool and elementary school classrooms. Caregivers wanted to expose their children to some common rhymes and songs so that children could more easily and comfortably participate in these group experiences.

In response to this request, BPEL provided additional funding to Neighborhood House since the 2007-08 program year. These funds were specifically designated to support staff training, the purchase of five additional books containing common English-language rhymes and songs, and the delivery of five additional weeks of home visits to families participating in PCHP. As part of the end-of-year parent interviews, caregivers served by Neighborhood House's PCHP program were asked to reflect on the helpfulness and benefits of these extra home visits.

Participating caregivers found the extra visits to be helpful, noting that they gained additional opportunities to positively interact with their child, and their child benefitted by learning songs, rhymes and new activities. They felt that, as a result of the additional visits, their child is more prepared for preschool and will be more comfortable with peers who already know these songs and rhymes.³⁷

Yes [it was helpful]! Because they know the same songs like the other kids and my kid is not behind to others. He remember very well all the songs.

It was wonderful and helpful for my grandson to learning in these rhymes and practicing these songs.

³⁷ Interviews with previous cohorts of caregivers identified similar themes.

CHANGES IN COMMUNITIES

There is evidence from interviews with Agency Coordinators and focus groups with Home Visitors that the impact of PCHP extends beyond the participating families to the friends and neighbors interacting with those families, and even possibly to the broader cultural community.

Recruiting families to participate in PCHP became easier over time as awareness of PCHP spread through word of mouth and non-participants witnessed the program's impact.

Program staff reported that they shifted from actively recruiting families – e.g., through partnerships with community organizations such as schools and clinics – to having families contact them to sign up for the program. Coordinators and Home Visitors explained that many caregivers initially agreed to participate to receive free books and toys, but as the findings above noted, caregivers began to experience the benefits of PCHP for their children and themselves. Caregivers shared these benefits with family members, friends and neighbors, many of whom also witnessed positive changes in participating children's behavior. Some caregivers invited peers to watch home visits and shared books and toys with them to demonstrate the value of the program.

When prospective participants learn about the program from trusted friends who share their background, they are less hesitant to allow a stranger into their home for visits. As a result, demand for the program has increased significantly over the years, to the point that implementing agencies' wait lists are full and they are forced to turn families away. Coordinators and Home Visitors report that families are now approaching them at community venues to sign up for PCHP, sometimes when their children are still in the womb. Some families who live outside of the service area offer to take their child to a family member or friend's house in Seattle so that they can participate.

Although agencies cannot serve all interested families with PCHP, they often refer them to other early learning services.

Families that do not receive a place in PCHP, or whose children are too young or old for the program, often express frustration to program staff. Coordinators direct many of these families to other services, sometimes offered through their agencies, to help meet their needs. For example, agencies refer families to preschool programs like Head Start and help them enroll their children or give them information about library story times.

Program staff report that many non-participating caregivers are following PCHP participants in recognizing that young children can learn, in part by observing changes among participating children.

As discussed above for PCHP families, many communities hold the belief that young children are too young to learn and that learning starts with school. According to program staff, this belief may even be shifting for families that are indirectly exposed to PCHP, e.g., by observing improvements in a participating child's behavior and communication ability and comparing his or her development to other children who are the same age or older. In this way, the shift in beliefs about early learning is extending beyond families participating in PCHP to the broader community. According to program staff, this trend

Changes in Communities

is not unique to any single community, but applies to all cultures participating in PCHP, and may also be a product of other programs and education campaigns in addition to PCHP.

The communities are really starting to understand what school readiness means. They are understanding that children starting school without any preschool...are behind if there aren't things happening in the home... Families are finally going, 'Aha, it's really important that we read and spend time talking and asking questions'... More and more parents are saying that they talk more with their children, they ask them more questions... I think it is coming at them from a lot of places, not just through PCHP...[but] I know PCHP has a big role in that awareness. (Agency Coordinator)

The communities that are served are sharing their delight in the program, and that's getting people talking about early childhood development in ways that didn't happen before. And that's an institutional change because you've injected something into the culture of the communities. (Agency Coordinator)

EXPLORING DIFFERENCES IN IMPACT

ORS has compiled a large pool of quantitative data across the roughly 400 families that have completed PCHP in Seattle over the past five years. With a dataset of this size, we had flexibility to conduct statistical tests to explore program impact by various participant characteristics based on CBT, PACT and TROLL scores. This allowed us to identify any patterns of significant differences and explore whether PCHP is working more or less effectively for certain subgroups.³⁸

Results of our analysis did not show meaningful and consistent differences across subgroups. Rather, it appears that all subgroups are benefitting from PCHP.

Characteristics we examined include gender, ethnicity, home language (English vs. non-English), family income, participating caregiver (mother, father, or FFN; teen parent; single parent), size of the family, and whether the family and Home Visitor match in terms of language and ethnicity.³⁹ We simultaneously controlled for other factors such as cohort and agency using a multivariate statistical technique.

When statistically significant differences in assessment scores across subgroups existed at baseline, these differences disappeared by the end of the program, providing evidence for the equalizing effect of PCHP and its effectiveness with diverse participants.

The most consistent difference at baseline was between Family, Friend and Neighbor (FFN) caregivers and mothers. FFN caregivers entered PCHP with significantly higher PACT scores than mothers, perhaps because many of these caregivers were grandmothers or other elders with possibly greater child rearing experience than their younger counterparts. However, by the end of the program, average PACT scores for mothers and FFN caregivers were roughly the same.

Another notable difference we found was that African and Hispanic children received lower average scores on the CBT at baseline compared with African-American children (the highest scoring group) but caught up to and even surpassed these children in terms of average CBT scores by the end of year two. Finally, male children started off lower on the TROLL than female children but were able to close the gap over the course of the program, possibly a product of differences in rates of language acquisition and development between girls and boys.

There were no significant differences in assessment scores by whether or not the family and Home Visitor matched in terms of language and ethnicity. However, only a relatively small number of families were not matched to their Home Visitor (n=38). See **APPENDIX B** for detailed documentation of differences in the program's impact for various subgroups.

³⁸ Despite the large sample size, some subgroups of participants were still too small to permit in-depth analysis of differences in program impact. For instance, only 13 fathers completed PCHP in Seattle across the four graduated cohorts of families, so our options for analyzing quantitative results for this group were limited.

³⁹ More information on participating families' distribution across these various demographic characteristics can be found in **TABLE 1** above. For family and Home Visitor match, 90 percent of graduated families (354 of 392) matched in terms of language and ethnicity while the remaining 10 percent (n=38) did not match.

Exploring Differences in Impact

It's possible that constraints with the data, such as the limited sensitivity of the assessment rating scales, precluded our ability to detect fine distinctions between subgroups. It seems clear, however, that PCHP is effective for diverse immigrant families and other unique populations (such as FFN caregivers) as well as African-American and other native born low-income families for whom research supporting PCHP's impact already exists.

We did not find a consistent effect of Play & Learn or Raising A Reader participation on families' assessment scores; however, participants reported experiencing other benefits.

When we examined the possible impact of Play & Learn attendance on assessment scores while controlling for other factors such as cohort, agency, income, etc., the results did not tell a clear story. It appears that families that attended Play & Learn may have entered PCHP at a slightly (but statistically significant) higher level than their non-attending counterparts on all three assessments. This finding may have been a product of selection bias, i.e., higher-performing families at baseline self-selected to attend Play & Learn groups, perhaps because they were better able to make arrangements to participate or were more likely to see the value of this activity. Therefore, we have no quantitative evidence for the effectiveness of Play & Learn in increasing scores on the three measured assessments.

Similar to our examination of the possible impact of Play & Learn on assessment scores, we did not find a consistent effect of Raising A Reader participation on scores, even after controlling for various characteristics. It again appeared that these families entered PCHP at a higher level than their counterparts, at least on the CBT and PACT (the differences were not statistically significant for the TROLL). Since families did not self-select to participate in Raising A Reader, it is not clear why these differences occurred. Detailed results are included in **APPENDIX B**. It appears that neither of these programs made a significant impact on participating families' assessment scores; however, families reported experiencing other benefits of participation, described previously.

LONGER-TERM IMPACT

Most families graduating from PCHP are transitioning their children into formal preschool programs.

Starting with the second cohort of PCHP graduates, Program Coordinators began collecting information about families’ plans to transition their children into other kinds of early learning programs following PCHP. For Cohorts 2 and 3, Coordinators checked in with families in the fall after PCHP graduation, if possible, to see if these plans had changed.⁴⁰ As **TABLE 3** shows, the vast majority of families in Cohorts 2 and 3 enrolled their families in preschool programs following PCHP, usually Head Start.

TABLE 3: Percentage of PCHP Graduates from Cohorts 2 and 3 with Specific Transition Plans

Type of Early Learning Program/Experience	Overall (n=215)	Cohort 2 (n=95)	Cohort 3 (n=120)
Preschool/Pre-K Program:	89	91	88
Head Start	56	43	64
Step Ahead/ECEAP	11	6	15
Other preschool/pre-K ⁴¹	23	41	8
Applied to Pre-K program but enrollment not confirmed	3	3	3
Family undecided/no plans	6	6	5

Interviews with caregivers echoed these findings. When asked what kinds of activities or programs they expect to participate in before their child starts kindergarten, caregivers who responded (n=95) identified preschool programs in addition to other activities such as library story time, activities at a community center and Play & Learn.

I will take my child to Play and Learn or reading time at library. I want my child learn specific at classroom. How to participate to hear story time, circle time, too.

Similar to their peers, PCHP graduates entered two publicly funded pre-K programs ready for preschool and left ready for Kindergarten.

Through an agreement with the City of Seattle, we were able to track PCHP graduates who entered into preschool programs associated with Seattle Step Ahead (funded by the City of Seattle Families and Education Levy) and the Early Childhood Education and Assistance Program (ECEAP; funded by Washington State and the City of Seattle) to explore the impact of PCHP beyond the two-year program.⁴² Overall, 37 PCHP graduates from Cohorts 1-3 participated in a Step Ahead or ECEAP program the year following PCHP.

⁴⁰ Coordinators also asked Cohort 4 families to share their initial plans for transitioning from PCHP, but final plans were not available in time for this report.

⁴¹ Other programs include any private or community-based preschool or pre-K program besides Head Start and Step Ahead/ECEAP. Some examples include Just Like Home and The Giddens School.

⁴² See http://www.seattle.gov/humanservices/children_families/school/preschool.htm for more information on these programs.

Longer-Term Impact

We created a comparison group of other Step Ahead/ECEAP participants (n=87) matched to those PCHP graduates with sufficient data on the following characteristics (n=29)⁴³: gender, ethnicity, primary language, and family annual income.⁴⁴ As part of the Creative Curriculum used by almost all Step Ahead/ECEAP programs, teachers complete an observational assessment of all children called the Creative Curriculum Developmental Continuum Assessment System (CCDCAS).⁴⁵ We did not find any significant differences between PCHP graduates and the comparison group of their peers in terms of average assessment scores on the CCDCAS.⁴⁶

The City of Seattle set the standard that children should attain a certain score on the CCDCAS at baseline in order to be ready for preschool and a higher score at the end of the school year to be ready for Kindergarten. The vast majority of PCHP graduates achieved this standard at baseline, and by the end of the school year, all PCHP graduates demonstrated their readiness for Kindergarten. Children from a matched comparison group attained similar scores. Going forward, we will be able to examine standardized test scores for PCHP graduates and a comparison group of their peers enrolled in Seattle Public Schools, which will provide a larger sample size and additional data to assess the long-term impact of PCHP.

Two-thirds of PCHP graduates from the first two cohorts entered Seattle Public Schools and will be tracked over time to examine their academic achievement compared with a group of their peers.

Currently, ORS, United Way of King County and Seattle Public Schools (SPS), with support from BPEL, are working out an agreement to continue sharing assessment data for PCHP graduates and their classmates. Through a prior contract, SPS and ORS were able to identify about two-thirds of PCHP enrollees (139 of 211) in the SPS dataset.⁴⁷ Among matched PCHP participants, 27 will start second grade during the 2010-11 school year, 70 will start first grade, and 19 will start kindergarten.

We are planning to analyze data from three standardized assessments: the Developmental Reading Assessment (DRA), administered in second grade; the Measurements of Student Progress (MSP), which was selected to replace the WASL statewide and will be administered in grades 3-8; and the High School Proficiency Exam (HSPE). As these assessments are for the most part completed in the spring, scores become available to ORS for analysis the next fall. At that point, we plan to attempt to match additional PCHP participants (e.g., who moved into the district after our first match) and form a comparison group

⁴³ Eight PCHP graduates were missing income data and had to be excluded from the analysis.

⁴⁴ We did not have sufficient data to control for other potentially important factors such as children's early childhood experiences besides PCHP and how they learned about Step Ahead/ECEAP programs.

⁴⁵ The CCDCAS is completed at three time points (fall, winter, spring) and uses a rating system of four steps (forerunner, I, II, III) to show children's progress on 50 developmental objectives grouped into four areas of development: Social/Emotional, Physical, Language, and Cognition.

⁴⁶ The lack of significant differences between PCHP graduates and their peers who did not participate in PCHP could be caused by a number of factors unrelated to PCHP, such as the relatively small size of the sample of PCHP graduates with sufficient data for analysis, differences between PCHP graduates and the comparison group that we could not control for, and limitations of the CCDCAS assessment.

⁴⁷ Among children who completed PCHP as opposed to those who just enrolled, we were able to match closer to three-quarters (127 of 176).

Longer-Term Impact

of peers based on factors such as ethnicity, gender, income, language proficiency and mobility outside of the school district.⁴⁸

A review of literature suggests that PCHP can have a positive return on investment in the long term by yielding individual benefits such as increased earnings and decreased expenditures on special education, social programs, and criminal justice.

In October 2006, ORS completed a brief study for BPEL entitled “Potential Cost Savings and Benefits Attributable to the Parent-Child Home Program” exploring the long-term return on investment of funds in early childhood initiatives. Like many programs that rely on corporate, philanthropic and tax-dollar investments, early childhood initiatives such as the Parent-Child Home Program have been called upon to document results. Cost-benefit analysis is one appreciable way to determine results, and, though estimating a specific benefit per dollar of cost for PCHP was beyond the scope of this study, evidence suggests that investment in PCHP can return direct benefits to children and parents who participate in the program, to taxpayers and to Washington’s economy.

Studies show that some early childhood interventions can yield specific benefits and returns on investment, including gains in a child’s emotional and cognitive development; improvements in the educational process or a child’s school achievement; increased economic self-sufficiency as a result of increased participation in the work force; higher income and decreased use of public assistance; reduced involvement in criminal activity; and improvements in certain health indicators.

Additionally, some researchers have argued that strong economic returns can result from investments in early childhood initiatives that promote positive child development.⁴⁹ These economists suggest that long-term economic development returns are generated through investments in human capital, specifically those investments that are directly linked to improving academic success. Many early childhood programs, including the Parent-Child Home Program, have been found to impact academic outcomes such as test scores, school retention and high school graduation. Some economists project that the rate of return may range from 7 to 16 percent annually for funds invested in a high quality early childhood development program.⁵⁰ In addition to individual benefits, research suggests that there are potential public cost savings associated with academic success and high school completion, e.g., because high school graduates are less likely to receive public assistance or be incarcerated.⁵¹

The potential returns suggested by evaluations of PCHP as well as other research on early childhood investments include:

- Individual benefits such as lasting cognitive and developmental gains, academic success, and school retention;

⁴⁸ Because of the small number of PCHP participants entering second grade this school year, we will likely need to wait until fall 2012 (after about 70 or more PCHP children complete second grade) to report meaningful results of comparisons between PCHP graduates and their peers.

⁴⁹ Grunewald R and Rolnick A. (2003). Early Childhood Development: Economic Development with a High Public Return. Minneapolis: Federal Reserve Bank of Minneapolis.

⁵⁰ Ibid.

⁵¹ Bridgeland JM, Dilulio JJ and Morison KB (2006). The Silent Epidemic: Perspectives of High School Dropouts. Report prepared by Civic Enterprises in association with Peter D. Hart Research Associates for the Bill and Melinda Gates Foundation.

Longer-Term Impact

- Increased earnings due to high school completion;
- Cost savings such as decreased expenditures on special education, social programs, and criminal justice costs; and
- Potential long-term improvements in the state's economic development as more capable, better educated workers enter labor markets.

Researchers note that specific benefits of programs such as PCHP are often difficult to quantify because the costs are immediate while the returns accrue over the long term and must be translated to dollar-value estimates. Cost-benefit analyses for programs such as PCHP are typically characterized by caveats and some degree of uncertainty. Though the potential monetary benefits yielded by PCHP are compelling, ensuring the safety and support of all young children is also a valuable civic and moral gesture that can generate results that are not easy to quantify in dollar terms.

LESSONS LEARNED FROM THE DEMONSTRATION

Over the years, ORS has collected information from supervisors, Agency Coordinators and Home Visitors to identify and document what it takes to implement PCHP well with the diverse group of participants served through the demonstration project. This has included exploration on the resources, approaches, conditions and other implementation factors that may bear on participant outcomes. This section presents cumulative findings that may be useful as PCHP expands beyond the initial demonstration agencies.⁵²

Implementing agencies should recruit, hire and retain Home Visitors who can be effective at enrolling and working with the target population.

For example, it is helpful for Home Visitors to share cultural and language backgrounds with target program participants. Agency Coordinators and Home Visitors reported that matching the family with a Home Visitor who shares their cultural and linguistic background helps to establish trust and enhance sensitivity to the home culture and environment. Many Home Visitors are “trusted advocates” in their communities who are well-known to community members and live in the same neighborhoods as many of the families they serve. They can offer additional assistance to families in terms of translations and referring them to culturally appropriate services.

At the same time, many families request Home Visitors who are native English speakers so that they and their children can learn English more quickly and familiarize themselves with American culture. Pairing a family with a Home Visitor from a different culture can encourage cultural exchange and mutual understanding, especially when the Home Visitors have access to other agency staff, such as family advocates, who share the same cultural background as the families and can educate the Home Visitor about their culture. These Home Visitors still stress to families that they should use their home language during visits.

In general, program staff reports that each family has its own unique culture, and that the Home Visitor’s job is to adapt to the culture of the home and not try to change it. Deep understanding of the family’s native culture and language can facilitate this process.

It is important for organizations to offer adequate supports and incentives to retain quality staff. It is worth investing in Home Visitors and retaining them, as Home Visitors enhanced their skills over time.

Agency Coordinators feel strongly that Home Visitors improved over the years as they gained experience. They reported that Home Visitors learned new tools, skills and ways to involve the family and motivate them to participate with consistency and complete the program. Home Visitors also became more confident going into others’ homes and more comfortable with the books and toys as well

⁵²ORS identified and documented potentially important elements of quality implementation in its April 2008 process evaluation of the Parent-Child Home Program/Play & Learn Initiative. More detailed findings can be found in the full report: Organizational Research Services. (2008). *Parent-Child Home Program/Play & Learn Group Demonstration Project: Documentation of Key Elements of Quality Implementation with Diverse Participants in Seattle*. Prepared for the Business Partnership for Early Learning/City of Seattle. Seattle, Washington.

as the assessments. Sharing different perspectives and experiences at agency staff meetings further reinforced this learning process.

Home Visitors thought that they got better over the years. The first year it was overcoming the enormous responsibility of going into someone else's home and being respectful... [Over time, Home Visitors] realized they are less judgmental, more relaxed, and when parents ask questions, they are able to give them good replies. I think it's just being comfortable with the program and I think they realize the program is working themselves. They are seeing tremendous change in the children that they're visiting and it just makes them want to be better. They hone their skills. (Agency Coordinator)

Agencies working with diverse participants need to provide high levels of staff training, supervision and support to implement key elements of the model. The support needed may change over time.

Agencies need to provide sufficient one-on-one supervision for Home Visitors whose first language is not English, especially during their first year. The amount of supervision time required may be affected by Home Visitors' backgrounds and skills as well as cultural and language differences between Home Visitors and Coordinators. Training may focus on developing Home Visitors' knowledge and skills regarding program delivery and child development and addressing their questions about evaluation implementation.

In addition, we found that the kind of support and supervision needed by Seattle sites changed over time. Coordinators continued a high level of supervision of Home Visitors across the years but shifted their focus from basic implementation of PCHP to professional development and problem-solving. For example, when agencies first began implementing PCHP, staff meetings were almost entirely focused on logistics: e.g., an overview of the next week's book or toy and practice using them, check-ins about assessments and other forms, etc. As Home Visitors became more comfortable with the routine of the program, coordinators restructured staff meetings to focus more on reflection and shared learning. For instance, Home Visitors discussed creative uses for the books and toys, shared difficult or rewarding experiences with families and sought advice, strategized about promoting specific indicators from the observational assessments, and assessed their own skills and areas for improvement. One agency has a Home Visitor lead a discussion on a topic related to child development at each staff meeting.

The model of requiring weekly meetings is really powerful and really important. Because that is when you get to hear [Home Visitors'] work, what's important to them, and there is a lot of sharing that goes on. (Agency Coordinator)

Funders should recognize that when serving a diverse group of program participants with a diverse staff, the average per-participant cost is likely to be higher than the national average.

Higher per-participant costs associated with serving diverse populations are related to the cost of hiring and retaining quality staff (e.g., offering salary and benefits instead of an hourly wage) and the level of staff training and support needed to meet staff needs and maintain program quality. When implementation is accompanied by evaluation, per-participant costs are also likely to be higher.

Agencies should have experience providing services to the target population, build good infrastructure and capacity, and demonstrate strong support for the program, including a willingness to commit necessary resources.

Funders should consider making grants to organizations with demonstrated capacity or supporting approaches that build organizational capacity. Home Visitors need to implement the model with fidelity but also effectively address the needs of families in unique situations, including visits with multiple children or adults and when working primarily with a Family, Friend and Neighbor (FFN) caregivers, such as grandparents.

Many home visits are not limited to the participating caregiver and child but also include other children and adults. Home Visitors have developed strategies for this context.

For visits that include multiple children, Home Visitors learned to add structure to the visit, similar to a “school” or “circle time” approach. They shared that they need to set rules and boundaries, especially with older children, and bring additional materials for them, but that the focus of the visit stays with the participating child. While Home Visitors welcome other children’s participation in visits, they also make it clear to everyone involved that the participating child is the main target of the visit, especially early on. Similarly, Home Visitors do not deter other adults from observing and participating in visits, as they receive benefits from the program and this situation reflects the home environment. But they do establish ground rules with adults and ask them not to participate if they are diverting attention from the primary participants.

Home Visitors working with Family, Friend and Neighbor (FFN) caregivers take extra steps to communicate with parents.

Some home visits are done with grandparents, aunts or uncles, as opposed to parents, because of parents’ work or school schedules or other limiting factors (e.g., for teen parents who depend on relatives to assist with child care). In this situation, Home Visitors make a point to check in with parents outside of visits and keep them updated about the child’s progress and remind them about activities they can do with the child. Otherwise, these visits are conducted like any other, except that the family might forget to bring program materials if the visit is held in another adult’s home. Home Visitors see the FFN caregiver as an extension of themselves who can model positive behaviors for the parent, which supports the family’s “team” approach to caring for the child.

It is important to allow opportunities for learning and reflection among multiple stakeholders.

Evaluation, along with regular reflection among program staff, funders and evaluators allows identification of ways program delivery might be enhanced and increases the likelihood the program will be able to achieve and document desired participant outcomes. For instance, regular meetings between funders, evaluators and program staff provided opportunities for dialogue and reflection on program implementation and evaluation findings and helped foster a strong commitment to program quality among service providers. Intentional tracking of outputs such as the number of hours committed to staff training and retention rates helped implementing organizations keep their eye on important factors that support strong participant outcomes.

LOOKING AHEAD

As United Way of King County assumes the role of funder of PCHP in Seattle and looks to expand the program throughout King County, this is an opportunity to reflect on the role of the business community in initiating this demonstration project and the contributions it has made to PCHP and the broader field.

Engagement of business leaders in the community was key to the success of the PCHP Demonstration Project in Seattle, as they provided time, money, connections, expertise and clout.

From the beginning of the time-limited demonstration project, BPEL intended to position PCHP for sustainability and expansion. The initial goals for the project were to show that children from diverse ethnic and language groups who were most likely to enter school unprepared could be effectively and sustainably served through an early learning program; to raise awareness about just how many children are not enrolled in formal early learning programs; and to encourage changes in public policy to support these children. Findings in this report provide strong evidence that BPEL's first goal was achieved, and through PCHP's impact as well as the voice and credibility of the funders, it appears that large steps were made towards achieving the latter two goals as well. In the words of BPEL's Program Coordinator for PCHP: *"It was a program, but it was intended to demonstrate something a lot bigger than a program."*

In various discussions with schools and education people, more than a few times [BPEL funders] had heard, "Well, there is nothing we can do to reach those kids that come to us unprepared. There is nothing that works. We don't know where to find them. We don't speak their language." So it was sort of this challenge of, "Don't tell me there is nothing that works. I want to go prove otherwise. I want to really find out if that's true or not." They felt like PCHP was the program that could determine that. (BPEL Program Coordinator)

BPEL gained credibility in policy circles by making the effort non-partisan, putting their own money behind the demonstration with no short-term benefit to their businesses, and lending their voices and connections to help build awareness of both the problem and the potential solution in PCHP. BPEL and its co-funder, the City of Seattle, were also willing to listen to providers and program staff and provide them with adequate resources and flexibility to reach the target population, while at the same time committing to strong implementation and evaluation to enhance program quality. In the words of one agency representative, *"We've felt supported [by our funders], so the Home Visitors feel support, so the families feel support, so the kids feel support."* Many of the original BPEL funders continue to be involved with the transition to United Way and their plans to expand the program.

Representatives from National PCHP report that other replication sites are following Seattle's example and reaching out to the business community for funding and support, equipped with data and annual reports to help make their case.

When [other PCHP sites] want to go to a bank in their state, they feel like they have a great example of a business community that made a very thoughtful and deliberative decision to invest in the program. That makes it more plausible for them to make that pitch to businesses in their own communities. (Representative from National PCHP)

The Seattle Demonstration Project contributed to PCHP as a model by documenting the program's impact with diverse populations and factors that enabled success.

The project demonstrated that diverse families could be engaged and served through PCHP and helped to identify elements of quality implementation (discussed in the previous section) that could be incorporated by other sites wishing to serve similarly diverse populations. National PCHP always valued the cultural match between the Home Visitor and the family served, but experiences in Seattle provided lessons about the challenges of making that happen on the ground and potential solutions, such as meeting the training and supervision needs of Home Visitors. According to National PCHP, other replication sites “look at the data in Seattle and think, ‘Oh, we really can do this.’”

Findings from Seattle also help to position PCHP among the menu of early learning services available to families with young children and to identify PCHP's unique niche in terms of outcomes and target population (e.g., child age, family income, etc.). For instance, PCHP's target audience appears to be low-income families who represent diverse cultural and language groups, while other programs may be more appropriate for other types of families.

Demographics are changing in this country, and I think programs have to adapt to those changes, and part of doing that is to dig into culture and to really understand it and ask some very tough questions. (National PCHP)

United Way of King County is now set to continue PCHP in Seattle and expand the program in size and scale across King County, building on the experiences of this demonstration project.

According to BPEL's Program Coordinator, “*The piece of this that wasn't even a twinkle in BPEL's eye is the concept of what would happen if you could take this program to scale in a county or city. Would you see larger community changes?*” United Way of King County is now poised to embark on this expansion with the confidence that PCHP has demonstrated strong and consistent outcomes with diverse families in Seattle.

Over the next several years, United Way plans to offer PCHP to any family in King County living in poverty that is interested in and can benefit from it. Eventually, United Way hopes to serve 1200 families per year with PCHP, more than seven times the 160 families currently served on an annual basis. As United Way takes PCHP to scale in King County, they intend to continue to focus on rigorous measurement of the program's effectiveness. The City of Seattle will also stay involved as a funder of PCHP at Southwest Youth & Family Services, and there is a possibility that this contribution could increase through re-passage of the Families and Education Levy in 2011.

CONCLUSION

Evaluation results show that Seattle agencies implemented PCHP with high quality and achieved strong and consistent outcomes for families with demonstrated need.

Evaluation findings indicate that BPEL and the City of Seattle's PCHP/Play & Learn Demonstration Project successfully reached children who are most likely to lack in school preparedness and come from families that are isolated and outside the reach of other formal programs with services that are well-suited to helping children and parents gain skills to support future school success. The Parent-Child Home Program is being implemented with fidelity to the model, and implementation is strong across all agencies.

Assessment data show that children and parents who participated in the full two-year program cycle have experienced statistically significant positive changes in their skills and behaviors that are consistent with the longer-term results demonstrated by PCHP research. Data suggest that successful outcomes do not differ by ethnic group or other participant characteristics, but rather that all participants benefit from the program. Families also report experiencing additional outcomes through participation in PCHP, such as increased engagement in other community services, activities and early learning programs and recognition of the importance of early learning and the parent's role as the child's first teacher. There is some evidence that these changing attitudes are extending beyond the participating families to their friends, neighbors and broader cultural community through word of mouth and first-hand observations of positive changes in children's behavior.

BPEL and the City of Seattle achieved their objectives for the demonstration project and, in partnership with United Way of King County, positioned PCHP for sustainability and expansion.

The evaluation of the five-year demonstration project identified many lessons for successful implementation of PCHP that can inform the continuation and expansion of the program going forward, as well as other PCHP replication sites around the country. ORS will continue to follow PCHP graduates as they transition into the public school system in order to assess Seattle PCHP's long-term outcomes and explore the program's potential for a strong return on investment. Evaluation data collected so far provide strong evidence for the program's impact with diverse families in Seattle, indicating that the Business Partnership for Early Learning and City of Seattle have achieved their primary objectives.

APPENDIX A: AVERAGE ASSESSMENT SCORE BY ITEM

Appendix A: Average Assessment Score by Item

TABLE 1: PACT Average Scores for All Cohorts Combined and by Cohort

Item	Baseline					EOY 1					EOY 2				
	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Parent gives child directions and encourages child to follow them (Q1)	2.29 (394) ⁵³	2.11 (81)	2.14 (91)	2.36 (120)	2.49 (102)	2.88 (393)	2.70 (80)	2.93 (92)	2.93 (119)	2.91 (102)	3.59 (398)	3.63 (81)	3.57 (95)	3.65 (120)	3.51 (102)
Parent responds verbally to child's request for attention (Q2)	2.23 (392)	2.06 (80)	2.08 (90)	2.34 (120)	2.38 (102)	2.80 (393)	2.58 (80)	2.86 (92)	2.86 (119)	2.87 (102)	3.62 (398)	3.72 (81)	3.58 (95)	3.63 (120)	3.56 (102)
Parent does not help child with tasks she is able to do for herself (Q3)	2.21 (359)	1.97 (73)	2.23 (66)	2.24 (120)	2.35 (100)	2.61 (393)	2.33 (80)	2.55 (92)	2.80 (119)	2.67 (102)	3.55 (398)	3.47 (81)	3.61 (95)	3.57 (120)	3.54 (102)
Parent shows warmth toward child (Q4)	2.60 (393)	2.49 (81)	2.47 (91)	2.53 (120)	2.89 (101)	3.16 (392)	2.92 (79)	3.20 (92)	3.10 (119)	3.36 (102)	3.82 (398)	3.77 (81)	3.84 (95)	3.88 (120)	3.77 (102)
Parent does not yell, nag or use harmful words (Q5) ⁵⁴	2.98 (194)	NA	NA	2.82 (101)	3.16 (93)	3.52 (219)	NA	NA	3.48 (117)	3.56 (102)	3.78 (222)	NA	NA	3.73 (120)	3.83 (102)
Parent clearly verbalizes expectations to the child (Q6)	2.05 (393)	1.88 (80)	1.88 (91)	2.11 (120)	2.26 (102)	2.55 (393)	2.38 (80)	2.64 (92)	2.59 (119)	2.56 (102)	3.48 (397)	3.48 (80)	3.43 (95)	3.53 (120)	3.46 (102)

⁵³ Number of graduated participants with data is in parentheses.

⁵⁴ This item was excluded from analyses of Cohorts 1 and 2 due to frequent misinterpretation. After conducting intensive trainings with home visitors on the correct interpretation, we are confident in the reliability of data on this item for Cohorts 3 and 4.

Appendix A: Average Assessment Score by Item

Item	Baseline					EOY 1					EOY 2				
	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Parent explains rationale for directions and expectations (Q7)	1.97 (388)	1.76 (76)	1.76 (91)	2.05 (119)	2.21 (102)	2.45 (392)	2.33 (80)	2.50 (92)	2.47 (119)	2.50 (101)	3.46 (398)	3.48 (81)	3.37 (95)	3.51 (120)	3.48 (102)
Parent verbalizes affection toward the child (Q8)	2.42 (390)	2.44 (81)	2.24 (87)	2.37 (120)	2.62 (102)	2.92 (393)	2.75 (80)	2.95 (92)	2.86 (119)	3.10 (102)	3.74 (398)	3.78 (81)	3.62 (95)	3.76 (120)	3.78 (102)
Parent's directions gains the child's attention (Q9)	2.13 (393)	1.97 (79)	2.07 (92)	2.18 (120)	2.24 (102)	2.68 (393)	2.54 (80)	2.74 (92)	2.69 (119)	2.73 (102)	3.50 (398)	3.52 (81)	3.54 (95)	3.51 (120)	3.45 (102)
Parent verbalizes approval of the child (Q10)	2.30 (394)	2.20 (81)	2.09 (91)	2.36 (120)	2.52 (102)	2.89 (393)	2.78 (80)	2.86 (92)	2.87 (119)	3.03 (102)	3.67 (398)	3.77 (81)	3.61 (95)	3.73 (120)	3.62 (102)
Parent encourages child to perform activities that she can do independently (Q11)	2.19 (383)	2.03 (70)	1.89 (91)	2.30 (120)	2.45 (102)	2.78 (393)	2.59 (80)	2.84 (92)	2.83 (119)	2.83 (102)	3.63 (398)	3.69 (81)	3.61 (95)	3.53 (120)	3.66 (102)
Parent satisfies child's needs (Q12)	2.20 (380)	2.00 (74)	2.01 (84)	2.27 (120)	2.41 (102)	2.74 (392)	2.43 (79)	2.77 (92)	2.81 (119)	2.87 (102)	3.60 (398)	3.57 (81)	3.62 (95)	3.51 (120)	3.56 (102)
Parent is persistent and consistent in enforcing directions (Q13)	2.08 (384)	1.89 (74)	1.86 (88)	2.12 (120)	2.34 (102)	2.57 (393)	2.40 (80)	2.59 (92)	2.62 (119)	2.64 (102)	3.49 (398)	3.43 (81)	3.46 (95)	3.76 (120)	3.49 (102)

Appendix A: Average Assessment Score by Item

Item	Baseline					EOY 1					EOY 2				
	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Parent tries to converse with child (Q14)	2.29 (387)	2.10 (77)	2.14 (88)	2.37 (120)	2.48 (102)	2.92 (391)	2.63 (78)	2.99 (92)	2.90 (119)	3.09 (102)	3.78 (398)	3.79 (81)	3.77 (95)	3.73 (120)	3.83 (102)
Parent trains child to perform age appropriate activities (Q15)	2.18 (377)	2.12 (74)	1.96 (83)	2.18 (118)	2.41 (102)	2.75 (392)	2.61 (80)	2.79 (91)	2.67 (119)	2.92 (102)	3.65 (398)	3.65 (81)	3.61 (95)	3.66 (120)	3.66 (102)
Parent comforts child (Q16)	2.43 (374)	2.20 (71)	2.30 (82)	2.44 (119)	2.69 (102)	2.90 (390)	2.44 (77)	3.01 (92)	2.87 (119)	3.19 (102)	3.75 (398)	3.73 (81)	3.66 (95)	3.83 (120)	3.75 (102)
Parent is firm with child (Q17)	2.06 (371)	1.96 (75)	1.79 (75)	2.09 (119)	2.31 (102)	2.57 (391)	2.43 (79)	2.64 (91)	2.50 (119)	2.69 (102)	3.52 (398)	3.43 (81)	3.46 (95)	3.56 (120)	3.60 (102)
Parent provides a verbal rationale for obedience (Q18)	1.98 (367)	1.76 (67)	1.76 (79)	2.06 (119)	2.22 (102)	2.48 (390)	2.18 (78)	2.62 (92)	2.55 (119)	2.51 (101)	3.50 (398)	3.54 (81)	3.41 (95)	3.55 (120)	3.49 (102)
Parent listens to child's reaction to a directive and reacts appropriately (Q19)	2.11 (377)	1.92 (76)	1.86 (79)	2.20 (120)	2.33 (102)	2.70 (393)	2.43 (80)	2.78 (92)	2.73 (119)	2.81 (102)	3.61 (398)	3.64 (81)	3.58 (95)	3.62 (120)	3.61 (102)
Parent smiles, nods or shows approval when child acts positively (Q20)	2.62 (394)	2.33 (80)	2.38 (92)	2.68 (120)	3.02 (102)	3.24 (392)	3.00 (80)	3.27 (919)	3.18 (119)	3.45 (102)	3.90 (398)	3.89 (81)	3.82 (95)	3.93 (120)	3.94 (102)

Appendix A: Average Assessment Score by Item

Item	Baseline					EOY 1					EOY 2				
	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Showing Affection Subscale ⁵⁵	2.44 (394)	2.30 (81)	2.27 (91)	2.46 (120)	2.70 (102)	3.00 (393)	2.76 (80)	3.04 (91)	2.96 (119)	3.20 (102)	3.77 (398)	3.79 (81)	3.72 (95)	3.80 (120)	3.78 (102)
Verbalizing Directions Subscale ⁵⁶	2.12 (394)	1.95 (81)	1.93 (91)	2.19 (120)	2.34 (102)	2.66 (393)	2.46 (80)	2.73 (92)	2.69 (119)	2.74 (102)	3.55 (398)	3.56 (81)	3.52 (95)	3.58 (120)	3.54 (102)
AVERAGE SCORE ACROSS ITEMS⁵⁷	2.23 (394)	2.07 (81)	2.05 (91)	2.28 (120)	2.46 (102)	2.78 (393)	2.56 (80)	2.83 (92)	2.78 (119)	2.89 (102)	3.63 (398)	3.64 (81)	3.59 (95)	3.66 (120)	3.62 (102)

Scale: 1=Never, 2=Sometimes, 3=Most the time, 4=Always

⁵⁵ This subscale was identified by ORS and consists of six PACT items related to the parent’s showing warmth, affection and approval; items include #4, 8, 10, 14, 16, 20. Reliability > 0.8.

⁵⁶ This subscale was identified by ORS and consists of 12 PACT items related to the parent’s verbalizing and enforcing directions and expectations; items include #1, 2, 6, 7, 9, 11, 12, 13, 15, 17, 18, 19. Reliability > 0.8.

⁵⁷ This average score accounts for 18 of 20 PACT items. The two items removed include #5 because of frequent misinterpretation for the first and second cohort, and #3 because of a large amount of missing data for this item. Reliability > 0.8.

Appendix A: Average Assessment Score by Item

TABLE 2: CBT Average Scores for All Cohorts Combined and by Cohort

Item	Baseline					EOY 1					EOY 2				
	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Approaches play in a systematic way (Q1)	1.98 (365) ⁵⁸	1.98 (57)	1.78 (88)	2.03 (118)	2.10 (102)	2.53 (393)	2.31 (81)	2.62 (91)	2.51 (119)	2.66 (102)	3.48 (398)	3.54 (81)	3.47 (95)	3.53 (120)	3.39 (102)
Smiles and laughs when involved in play activities (Q2)	2.30 (393)	2.11 (80)	2.25 (91)	2.33 (120)	2.44 (102)	2.85 (393)	2.65 (80)	2.86 (92)	2.79 (119)	3.06 (102)	3.70 (398)	3.67 (81)	3.63 (95)	3.76 (120)	3.71 (102)
Does not hit, poke or bite others (Q3) ⁵⁹	2.94 (188)	NA	NA	2.98 (98)	2.90 (90)	3.36 (218)	NA	NA	3.36 (116)	3.35 (102)	3.78 (221)	NA	NA	3.73 (120)	3.83 (101)
Can describe in words or sentences the pictures in a book (Q4)	1.87 (382)	1.80 (70)	1.77 (90)	1.91 (120)	1.97 (102)	2.35 (393)	2.30 (80)	2.36 (92)	2.37 (119)	2.35 (102)	3.44 (398)	3.40 (81)	3.44 (95)	3.53 (120)	3.37 (102)
Initiates positive activities (Q5)	2.01 (376)	1.82 (67)	1.85 (88)	2.05 (119)	2.23 (102)	2.45 (393)	2.28 (80)	2.43 (92)	2.52 (119)	2.51 (102)	3.54 (398)	3.57 (81)	3.48 (95)	3.61 (120)	3.48 (102)
Accepts or seeks help when experiencing difficulty with a task (Q6)	1.95 (375)	1.74 (72)	1.75 (83)	2.03 (188)	2.17 (102)	2.41 (393)	2.25 (80)	2.35 (92)	2.43 (119)	2.56 (102)	3.46 (397)	3.59 (80)	3.36 (95)	3.45 (120)	3.45 (102)
Is cooperative with adults (Q7)	2.19 (392)	1.94 (80)	2.11 (90)	2.29 (120)	2.35 (102)	2.74 (394)	2.48 (81)	2.77 (92)	2.80 (119)	2.86 (102)	3.63 (398)	3.68 (81)	3.57 (95)	3.63 (120)	3.64 (102)
Participates in pretend playtime activities (Q8)	2.09 (336)	2.02 (48)	1.92 (71)	2.14 (15)	2.20 (102)	2.58 (391)	2.36 (78)	2.63 (92)	2.53 (119)	2.77 (102)	3.66 (398)	3.77 (81)	3.54 (95)	3.68 (120)	3.67 (102)
Expresses strong positive or negative feelings appropriately (Q9)	1.92 (359)	1.72 (61)	1.70 (82)	2.05 (114)	2.08 (102)	2.39 (384)	2.14 (71)	2.32 (92)	2.41 (119)	2.60 (102)	3.31 (398)	3.30 (81)	3.29 (95)	3.36 (120)	3.28 (102)

⁵⁸ Number of graduated participants with data is in parentheses.

⁵⁹ This item was excluded from analyses of Cohorts 1 and 2 due to frequent misinterpretation. After conducting intensive trainings with home visitors on the correct interpretation, we are confident in the reliability of data on the item for Cohorts 3 and 4.

Appendix A: Average Assessment Score by Item

Item	Baseline					EOY 1					EOY 2				
	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Understands and completes activities that are developmentally appropriate (Q10)	2.03 (377)	1.96 (71)	1.94 (85)	2.07 (119)	2.13 (102)	2.52 (394)	2.32 (81)	2.57 (92)	2.54 (119)	2.62 (102)	3.61 (398)	3.63 (81)	3.56 (95)	3.64 (120)	3.60 (102)
Asserts ownership over toys and possessions (Q11)	2.36 (380)	2.22 (73)	2.37 (86)	2.32 (119)	2.51 (102)	2.79 (394)	2.46 (81)	2.84 (92)	2.79 (119)	3.00 (102)	3.67 (398)	3.73 (81)	3.66 (95)	3.65 (120)	3.67 (102)
Follows necessary rules in family setting (Q12)	2.05 (368)	1.93 (68)	1.93 (82)	2.07 (116)	2.20 (102)	2.53 (392)	2.32 (81)	2.52 (90)	2.59 (119)	2.62 (102)	3.52 (398)	3.48 (81)	3.58 (95)	3.51 (120)	3.52 (102)
Is creative and inventive during playtime activities (Q13)	1.94 (380)	1.94 (72)	1.77 (86)	1.96 (120)	2.08 (102)	2.41 (393)	2.23 (80)	2.45 (92)	2.45 (119)	2.48 (102)	3.49 (398)	3.53 (81)	3.39 (95)	3.60 (120)	3.43 (102)
Tolerates necessary frustration (Q14)	1.91 (344)	1.73 (63)	1.83 (65)	1.90 (114)	2.08 (102)	2.35 (385)	1.99 (77)	2.24 (88)	2.45 (118)	2.59 (102)	3.33 (398)	3.32 (81)	3.28 (95)	3.35 (120)	3.35 (102)
Expresses a sense of pride by smiling or clapping upon completion of a new activity (Q15)	2.25 (387)	2.01 (77)	2.20 (89)	2.25 (119)	2.45 (102)	2.81 (392)	2.57 (79)	2.77 (92)	2.74 (119)	3.11 (102)	3.76 (398)	3.77 (81)	3.64 (95)	3.83 (120)	3.77 (102)
Initiates interaction or responds to others with little hesitation (Q16)	1.97 (379)	1.88 (67)	1.82 (91)	2.01 (119)	2.11 (102)	2.44 (391)	2.06 (78)	2.49 (92)	2.45 (119)	2.67 (102)	3.47 (398)	3.47 (81)	3.41 (95)	3.51 (120)	3.47 (102)
Demonstrates sharing and tolerates delays in having needs met (Q17)	1.92 (360)	1.72 (65)	1.89 (74)	1.94 (119)	2.05 (102)	2.36 (391)	1.95 (80)	2.40 (90)	2.41 (119)	2.58 (102)	3.40 (398)	3.35 (81)	3.42 (95)	3.35 (120)	3.49 (102)
Avoids everyday dangers (Q18)	2.25 (275)	1.93 (30)	2.19 (42)	2.19 (102)	2.43 (101)	2.69 (358)	2.10 (60)	2.64 (78)	2.79 (119)	2.96 (101)	3.60 (397)	3.70 (80)	3.61 (95)	3.61 (120)	3.52 (102)
Moods are appropriate to situations (Q19)	2.12 (380)	1.97 (71)	2.06 (87)	2.13 (120)	2.28 (102)	2.63 (389)	2.32 (76)	2.62 (92)	2.68 (119)	2.82 (102)	3.57 (398)	3.56 (81)	3.55 (95)	3.60 (120)	3.56 (102)

Appendix A: Average Assessment Score by Item

Item	Baseline					EOY 1					EOY 2				
	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Attentive and concentrates on activities for up to three minutes (Q20)	2.35 (388)	2.03 (75)	2.23 (92)	2.50 (119)	2.54 (102)	2.96 (393)	2.66 (80)	3.03 (92)	3.03 (119)	3.06 (102)	3.87 (398)	3.88 (81)	3.87 (95)	3.89 (120)	3.84 (102)
AVERAGE SCORE ACROSS ITEMS⁶⁰	2.07 (383)	1.93 (72)	1.97 (89)	2.11 (120)	2.22 (102)	2.56 (394)	2.31 (81)	2.57 (92)	2.58 (119)	2.72 (102)	3.55 (398)	3.57 (81)	3.51 (95)	3.58 (120)	3.54 (102)

Scale: 1=Never, 2=Sometimes, 3=Most the time, 4=Always

⁶⁰ This average score accounts for 18 of 20 CBT items. The two items removed include #3 because of frequent misinterpretation for the first and second cohort, and #18 because of a large amount of missing data for this item. Reliability > 0.8.

Appendix A: Average Assessment Score by Item

TABLE 3: TROLL Average Scores for All Cohorts Combined and by Cohort

Item	EOY 1					EOY 2				
	Overall	Cohort 1 ⁶¹	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4
How clearly and logically does the child communicate things that she sees or experiences? (Q1)	2.28 (315) ⁶²	NA	2.19 (94)	2.31 (119)	2.33 (102)	3.31 (396)	2.93 (80)	3.40 (95)	3.58 (120)	3.20 (102)
How would you describe this child's pattern of asking questions about topics that interest her? (Q2)	2.23 (314)	NA	2.23 (93)	2.22 (119)	2.24 (102)	3.25 (397)	2.98 (80)	3.35 (95)	3.68 (120)	3.12 (102)
How often does the child try out new words? (Q3)	2.86 (316)	NA	2.82 (95)	2.91 (119)	2.84 (102)	3.50 (393)	3.25 (76)	3.52 (95)	3.68 (120)	3.48 (102)
When the child speaks, is she understandable? (Q4)	3.01 (316)	NA	3.04 (95)	2.99 (119)	2.99 (102)	3.72 (392)	3.56 (75)	3.66 (95)	3.84 (120)	3.75 (102)
How often does the child express curiosity about how and why things happen? (Q5)	2.74 (315)	NA	2.67 (94)	2.70 (119)	2.85 (102)	3.49 (392)	3.33 (75)	3.41 (95)	3.69 (120)	3.43 (102)
Language Use Subscale (Q1-5)	2.62 (316)	NA	2.59 (95)	2.63 (119)	2.65 (102)	3.45 (397)	3.19 (80)	3.47 (95)	3.65 (120)	3.39 (102)
Comparable Language Use Subscale (Q1-5) ⁶³	2.62 (316)	NA	2.59 (95)	2.63 (119)	2.65 (102)	3.55 (317)	NA	3.47 (95)	3.65 (120)	3.39 (102)
How much does the child like to hear books read? (Q6)	3.40 (316)	NA	3.39 (95)	3.38 (119)	3.44 (102)	3.89 (393)	3.87 (76)	3.82 (95)	3.93 (120)	3.90 (102)
How often does the child attend to books or stories and react in a way that indicates she really understands? (Q7)	3.09 (316)	NA	3.08 (95)	2.99 (119)	3.20 (102)	3.79 (393)	3.61 (76)	3.78 (95)	3.90 (120)	3.80 (102)

⁶¹ Because the Adapted TROLL assessment was still being developed at the end of Cohort 1's first year, data are not available.

⁶² Number of graduated participants with data is in parentheses.

⁶³ Comparable subscales include only items that appear on both the EOY1 and EOY2 TROLL assessments; EOY1 average scores do not change but EOY2 average scores include fewer items. Because Cohort 1 only completed the TROLL at EOY2, overall comparable scores do not include Cohort 1 at either time point.

Appendix A: Average Assessment Score by Item

Item	EOY 1					EOY 2				
	Overall	Cohort 1 ⁶¹	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Is the child able to engage with story books on her own? (Q8)	1.98 (315)	NA	1.89 (94)	2.08 (119)	1.95 (102)	2.78 (397)	2.50 (80)	2.83 (95)	3.00 (120)	2.70 (102)
How often does child remember the story line or characters in a book that she has read with the Home Visitor and/or others? (Q9)	2.65 (314)	NA	2.47 (95)	2.74 (117)	2.70 (102)	3.36 (397)	2.94 (80)	3.41 (95)	3.63 (120)	3.31 (102)
Can the child recognize printed letters (English and/or home language)? (Q10)	1.71 (313)	NA	1.71 (92)	1.76 (119)	1.64 (102)	2.69 (394)	2.28 (78)	2.79 (94)	2.86 (120)	2.71 (102)
Does the child recognize her first name in print? (Q11)	--	--	--	--	--	0.85⁶⁴ (370)	0.58 (63)	0.93 (87)	0.98 (120)	0.89 (100)
Can the child recognize or read any other words? (Q12)	--	--	--	--	--	2.63 (395)	2.37 (78)	2.54 (95)	2.98 (120)	2.50 (102)
Does the child have an understanding of the relationships between sounds and letters? (Q13)	--	--	--	--	--	2.75 (394)	2.43 (77)	2.69 (95)	3.10 (120)	2.63 (102)
Can the child sound out words that she has not read before? (Q14)	--	--	--	--	--	2.38 (388)	2.10 (71)	2.39 (95)	2.68 (120)	2.23 (102)
Reading Subscale (Q6-14)	2.57 (316)	NA	2.52 (95)	2.59 (119)	2.58 (102)	2.84 (397)	2.68 (80)	2.83 (95)	3.01 (120)	2.77 (102)
Comparable Reading Subscale (Q6-10)	2.57 (316)	NA	2.52 (95)	2.59 (119)	2.58 (102)	3.37 (317)	NA	3.33 (95)	3.47 (120)	3.28 (102)
How often does the child hold a book correctly on her own? (Q15)	3.19 (316)	NA	3.20 (95)	3.15 (119)	3.23 (102)	3.89 (392)	3.82 (76)	3.86 (95)	3.92 (119)	3.92 (102)

⁶⁴ Average score for this item shows percentage of children who recognized their name in print.

Appendix A: Average Assessment Score by Item

Item	EOY 1					EOY 2				
	Overall	Cohort 1 ⁶¹	Cohort 2	Cohort 3	Cohort 4	Overall	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Does the child recognize the front and back of a book? (Q16)	3.10 (314)	NA	3.09 (94)	3.05 (118)	3.18 (102)	3.89 (393)	3.75 (76)	3.89 (95)	3.95 (120)	3.91 (102)
Does the child turn the pages in a book a single page at a time? (Q17)	3.04 (316)	NA	2.98 (95)	3.00 (119)	3.14 (102)	3.84 (392)	3.68 (76)	3.84 (95)	3.92 (120)	3.87 (102)
Does the child know the difference between words and numbers? (Q18)	--	--	--	--	--	3.45 (392)	3.00 (75)	3.45 (95)	3.77 (120)	3.40 (102)
Does the child know the directionality of print? (Q19)	--	--	--	--	--	3.35 (392)	3.01 (75)	3.38 (95)	3.60 (120)	3.29 (102)
Does the child recognize where the beginning of a sentence starts? (Q20)	--	--	--	--	--	3.01 (396)	2.86 (79)	2.84 (95)	3.39 (120)	2.83 (102)
Can the child recognize a word on a page? (Q21)	--	--	--	--	--	3.12 (393)	2.80 (76)	3.03 (95)	3.49 (120)	3.00 (102)
Print Concepts Subscale (Q15-21)	3.11 (316)	NA	3.09 (95)	3.07 (119)	3.18 (102)	3.51 (397)	3.29 (80)	3.47 (95)	3.72 (120)	3.46 (102)
Comparable Print Concepts Subscale (Q15-17)	3.11 (316)	NA	3.09 (95)	3.07 (119)	3.18 (102)	3.90 (317)	NA	3.87 (95)	3.93 (120)	3.90 (102)
TOTAL SCORE (Q1-21)	2.71 (316)	NA	2.68 (95)	2.71 (119)	2.75 (102)	3.21 (397)	3.01 (80)	3.20 (95)	3.40 (120)	3.15 (102)
COMPARABLE TOTAL SCORE (Q1-10, 15-17)	2.71 (316)	NA	2.68 (95)	2.71 (119)	2.75 (102)	3.55 (317)	NA	3.51 (95)	3.65 (120)	3.47 (102)

Description of Scales:

Q1: 1=child is very tentative, only offers a few words, needs you to ask questions, has difficulty answering questions when asked; 2=child offers some information but leaves out information you need to clearly understand her (such as when/where something happened, who was there, the sequence of events); 3=child offers information and sometimes includes the necessary information to clearly understand; and 4=child freely offers information and tells experiences in a way that is nearly always complete, well-sequenced and easily understood

Q2: 1=child has never asked questions showing she is interested in something or someone; 2=on a few occasions, child has asked some questions, discussion that followed was brief and did not have much depth; 3=on several occasions the child has asked interesting questions about something or someone, sometimes led to longer, deeper conversations; 4=child often asks questions about something or someone that interests her, often leads to longer, deeper conversations.

Q3-9: 1=never; 2=rarely; 3=sometimes, 4=often

Q10: 1=recognizes no letters; 2=recognizes 1-10 letters; 3=recognizes 10+ letters; 4=recognizes all letters

Q11: 0=no, 1=yes

Appendix A: Average Assessment Score by Item

Q12: 1=recognizes no other words; 2=recognizes 1-2 other words; 3=recognizes 3-5 other words, 4=recognizes 6+ other words

Q13: 1=child has no understanding of letter sounds; 2=child understands 1-2 letter sounds; 3=child understands 3-5 letter sounds; 4=child understands 6+ letter sounds

Q14: 1=child cannot sound out any words; 2=child has done this once or twice; 3=child has done this some with 1-syllable words; 4=child can do this with many words

Q15-21: 1=never; 2=rarely; 3=sometimes, 4=often

Appendix A: Average Assessment Score by Item

APPENDIX B: DIFFERENCES IN PROGRAM IMPACT BY SUBGROUP

Appendix B: Differences in Program Impact by Subgroup

TABLE 1: PACT Unadjusted & Adjusted Score Differences for Various Subgroups

Note: For all three assessments, Cohort and Agency were included as covariates in the adjusted models.

Group	Baseline Average Score	EOY2 Average Score	Average Change Score: Baseline to EOY2	Unadjusted Difference in Change Score ⁶⁵	Adjusted Difference in Change Score ⁶⁶
Child Gender					
Female (n=178)	2.25	3.62	1.38	(ref)	(ref)
Male (n=216)	2.21	3.63	1.43	0.05	0.04
Child Ethnicity					
African-American (n=87)	2.49	3.68	1.19	(ref)	(ref)
African (n=101)	2.13	3.66	1.53	0.34***	0.11
Asian (n=112)	2.19	3.55	1.36	0.17*	0.11
Hispanic (n=65)	2.04	3.57	1.54	0.35***	0.09
Home Language					
English (n=118)	2.45	3.69	1.24	-0.23***	0.05
Non-English (n=275)	2.13	3.60	1.48	(ref)	(ref)
Family Income					
<\$10,000/year (n=165)	2.17	3.60	1.44	0.16†	0.16*
\$10-\$25,000/year ⁶⁷ (n=184)	2.23	3.64	1.41	0.13	0.12
>\$25,000/year (n=43)	2.40	3.68	1.28	(ref)	(ref)
Participating Caregiver					
Mother (n=352)	2.20	3.62	1.43	(ref)	(ref)
Father (n=13)	2.43	3.71	1.28	-0.15	-0.02
FFN (n=26)	2.53	3.64	1.11	-0.31**	-0.30**
Teen Parent (n=41)	2.18	3.54	1.36	-0.01	-0.06
All Others (n=351)	2.23	3.64	1.41	(ref)	(ref)
Single Parent (n=135)	2.34	3.64	1.30	-0.16**	-0.14*
All Others (n=257)	2.16	3.62	1.46	(ref)	(ref)

⁶⁵ Unadjusted difference between indicated category and the reference category for that variable - e.g., the change score for males was 0.05 greater than that for females.

⁶⁶ Adjusted difference between indicated category and the reference category for that variable - e.g., the change score for males was 0.04 greater than that for females, with all other covariates included in the model: gender, cohort, agency, ethnicity, primary language, income, type of caregiver, number of siblings, and whether the Home Visitor and family match in terms of language and ethnicity.

⁶⁷ An annual income of \$25,000 is approximately the federal poverty line for a family of four in 2010.

Number of Siblings					
0 (n=137)	2.29	3.60	1.31	-0.15*	0.01
1-2 (n=186)	2.19	3.65	1.46	(ref)	(ref)
3+ (n=170)	2.20	3.64	1.44	-0.02	-0.15*
Family & Home Visitor Match					
Yes (n=354)	2.23	3.62	1.39	-0.13	-0.10
No (n=38)	2.18	3.70	1.52	(ref)	(ref)
Play & Learn Participation					
0-2 times (n=167)	2.32	3.59	1.27	(ref)	(ref)
3-12 times (n=59)	2.18	3.64	1.45	-0.14	-0.17*
13-24 times (n=41)	2.31	3.58	1.27	-0.32**	-0.22*
25+ times (n=47)	2.16	3.48	1.32	-0.27*	-0.23*
Raising A Reader Participation					
Yes (n=73)	2.59	3.54	0.95	-0.56***	-0.60***
No (n=321)	2.14	3.65	1.51	(ref)	(ref)

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

TABLE 2: CBT Unadjusted & Adjusted Score Differences for Various Subgroups

Note: For all three assessments, Cohort and Agency were included as covariates in the adjusted models.

Group	Baseline Average Score	EOY2 Average Score	Average Change Score: Baseline to EOY2	Unadjusted Difference in Change Score ⁶⁸	Adjusted Difference in Change Score ⁶⁹
Child Gender					
Female (n=175)	2.10	3.57	1.48	(ref)	(ref)
Male (n=208)	2.05	3.54	1.49	0.01	0.01
Child Ethnicity					
African-American (n=81)	2.24	3.50	1.26	(ref)	(ref)
African (n=101)	1.95	3.62	1.67	0.41***	0.28*
Asian (n=110)	2.11	3.51	1.40	0.14*	0.17
Hispanic (n=63)	1.95	3.54	1.60	0.34***	0.19†
Home Language					
English (n=111)	2.21	3.52	1.32	-0.23***	0.09
Non-English (n=271)	2.01	3.56	1.55	(ref)	(ref)
Family Income					
<\$10,000/year (n=157)	2.05	3.55	1.51	0.11	0.08
\$10-\$25,000/year ⁷⁰ (n=181)	2.07	3.54	1.48	0.07	0.02
>\$25,000/year (n=43)	2.17	3.57	1.41	(ref)	(ref)
Participating Caregiver					
Mother (n=344)	2.05	3.55	1.51	(ref)	(ref)
Father (n=12)	2.31	3.66	1.32	-0.19	-0.03
FFN (n=24)	2.36	3.57	1.19	-0.32**	-0.26**
Teen Parent (n=40)	2.09	3.51	1.42	-0.04	-0.08
All Others (n=341)	2.07	3.56	1.49	(ref)	(ref)
Single Parent (n=129)	2.13	3.52	1.39	-0.14**	-0.07
All Others	2.04	3.57	1.53	(ref)	(ref)

⁶⁸ Unadjusted difference between indicated category and the reference category for that variable - e.g., the change score for males was 0.01 greater than that for females.

⁶⁹ Adjusted difference between indicated category and the reference category for that variable - e.g., the change score for males was 0.01 greater than that for females, with all other covariates included in the model: gender, cohort, agency, ethnicity, primary language, income, type of caregiver, number of siblings, and whether the Home Visitor and family match in terms of language and ethnicity.

⁷⁰ An annual income of \$25,000 is approximately the federal poverty line for a family of four in 2010.

(n=252)					
Number of Siblings					
0 (n=132)	2.12	3.50	1.39	-0.12*	0.03
1-2 (n=181)	2.06	3.57	1.51	(ref)	(ref)
3+ (n=69)	2.01	3.61	1.60	0.09	-0.05
Family & Home Visitor Match					
Yes (n=343)	2.07	3.53	1.47	-0.18*	-0.14
No (n=38)	2.08	3.72	1.64	(ref)	(ref)
Play & Learn Participation					
0-2 times (n=162)	2.12	3.48	1.37	(ref)	(ref)
3-12 times (n=58)	2.10	3.58	1.48	-0.12	-0.17†
13-24 times (n=39)	2.16	3.50	1.34	-0.27**	-0.29**
25+ times (n=47)	1.96	3.39	1.43	-0.17†	-0.23*
Raising A Reader Participation					
Yes (n=73)	2.30	3.44	1.14	-0.42***	-0.51***
No (n=310)	2.02	3.57	1.56	(ref)	(ref)

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

TABLE 3: TROLL Unadjusted & Adjusted Score Differences Various Subgroups

Note: For all three assessments, Cohort and Agency were included as covariates in the adjusted models.

Group	EOY1 Average Score ⁷¹	EOY2 Average Score ⁷²	Average Change Score: EOY1 to EOY2 ⁷³	Unadjusted Difference in Change Score ⁷⁴	Adjusted Difference in Change Score ⁷⁵
Child Gender					
Female (n=148)	2.78	3.24	0.77	(ref)	(ref)
Male (n=168)	2.65	3.18	0.89	0.13*	0.13**
Child Ethnicity					
African-American (n=80)	2.96	3.34	0.62	(ref)	(ref)
African (n=63)	2.46	3.01	1.02	0.40***	0.37**
Asian (n=98)	2.62	3.32	0.96	0.33***	0.17
Hispanic (n=48)	2.78	3.11	0.68	0.06	0.10
Home Language					
English (n=91)	2.93	3.31	0.66	-0.25***	0.001
Non-English (n=225)	2.63	3.17	0.90	(ref)	(ref)
Family Income					
<\$10,000/year (n=126)	2.73	3.19	0.80	0.01	-0.05
\$10-\$25,000/year ⁷⁶ (n=149)	2.68	3.20	0.88	0.09	0.02
>\$25,000/year (n=41)	2.78	3.29	0.79	(ref)	(ref)
Participating Caregiver					
Mother (n=286)	2.69	3.18	0.85	(ref)	(ref)
Father (n=11)	3.06	3.59	0.71	-0.13	-0.02
FFN (n=18)	2.84	3.31	0.77	-0.08	0.08
Teen Parent (n=30)	2.70	3.28	0.85	0.04	-0.01
All Others (n=285)	2.71	3.20	0.83	(ref)	(ref)

⁷¹ EOY1 scores do not include Cohort 1 because the Adapted TROLL assessment was still being developed at the end of Cohort 1's first year.

⁷² The EOY2 TROLL contains several additional, more advanced items related to reading and print concepts to account for the child's natural development. Therefore, EOY2 average scores are not comparable to EOY1 average scores.

⁷³ In order to compare across years, we only included items from the EOY2 TROLL that were also included on the EOY1 TROLL (i.e., #1-10, 15-17 from the EOY2 TROLL).

⁷⁴ Unadjusted difference between indicated category and the reference category for that variable - e.g., the change score for males was 0.13 greater than that for females.

⁷⁵ Adjusted difference between indicated category and the reference category for that variable - e.g., the change score for males was 0.13 greater than that for females, with all other covariates included in the model: gender, cohort, agency, ethnicity, primary language, income, type of caregiver, number of siblings, and whether the Home Visitor and family match in terms of language and ethnicity.

⁷⁶ An annual income of \$25,000 is approximately the federal poverty line for a family of four in 2010.

Single Parent (n=96)	2.79	3.24	0.78	-0.09	0.08
All Others (n=219)	2.68	3.19	0.86	(ref)	(ref)
Number of Siblings					
0 (n=115)	2.74	3.24	0.79	-0.04	-0.02
1-2 (n=147)	2.77	3.26	0.82	(ref)	(ref)
3+ (n=54)	2.49	3.01	0.96	0.14†	0.02
Family & Home Visitor Match					
Yes (n=283)	2.68	3.19	0.85	0.13	0.10
No (n=32)	2.94	3.32	0.72	(ref)	(ref)
Play & Learn Participation					
0-2 times (n=125)	2.81	3.26	0.76	(ref)	(ref)
3-12 times (n=45)	2.63	3.12	0.97	-0.23	-0.20
13-24 times (n=38)	2.69	3.14	0.78	-0.41**	-0.47**
25+ times (n=47)	2.45	3.16	0.99	-0.21	-0.22
Raising A Reader Participation					
Yes (n=73)	2.71	3.09	0.71	-0.16**	-0.12
No (n=243)	2.72	3.23	0.87	(ref)	(ref)

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

