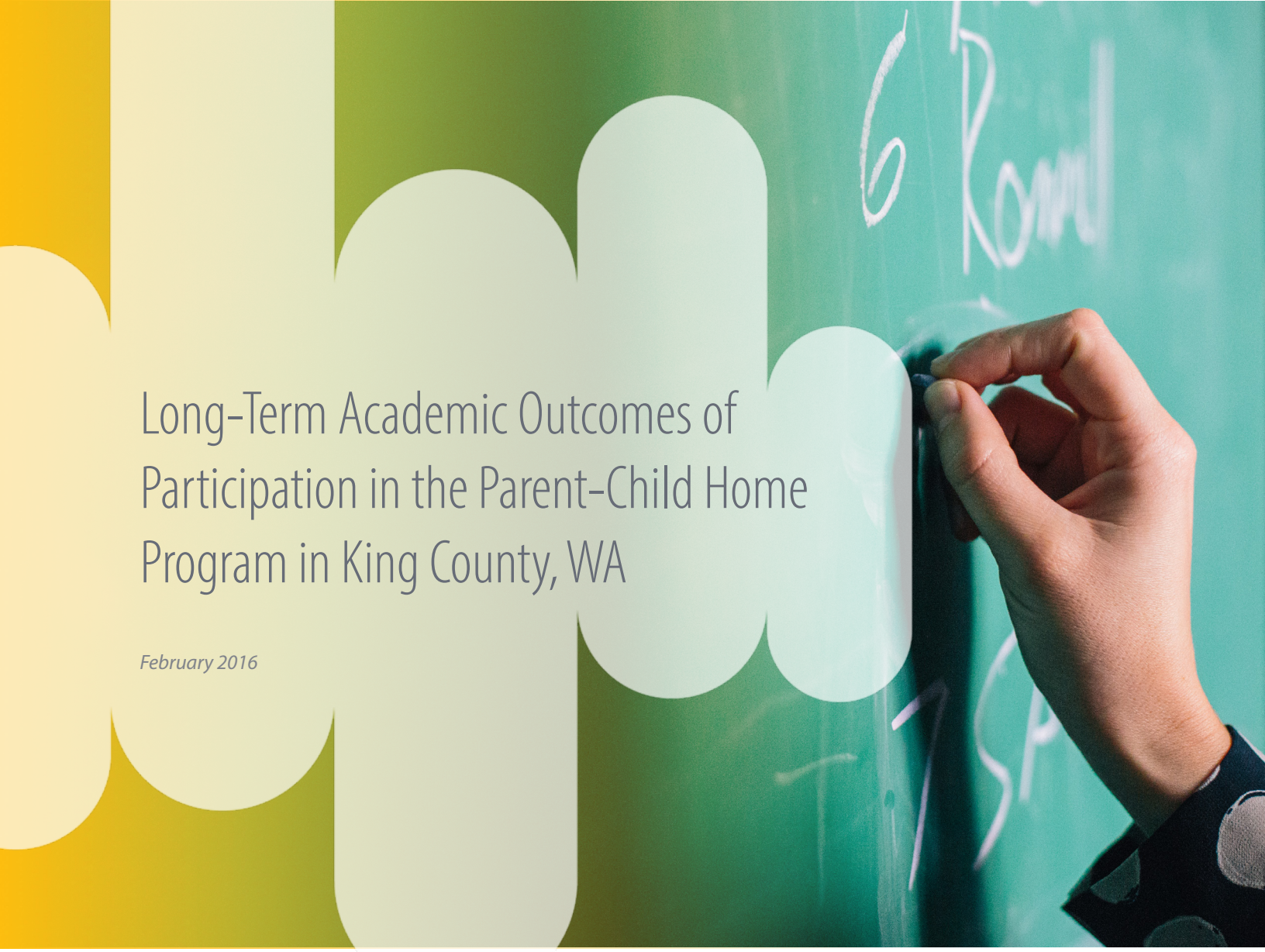

Long-Term Academic Outcomes of Participation in the Parent-Child Home Program in King County, WA

February 2016

Background

The Parent-Child Home Program (PCHP) is an intensive two-year home-visiting program aimed at increasing school readiness among young children from families who face multiple obstacles to educational and economic success, such as poverty, low literacy, limited education, and language barriers. Families enroll when children are about two years old and receive two 30-minute visits per week for 23 weeks in each year of the program, for a total of 92 visits. During these visits, a home visitor who shares a language and cultural background with the family uses a non-directive approach and a high-quality toy or book, which is left as a gift for the family, to model behaviors for parents that enhance children's development.

PCHP is a national program that was launched in 1965. PCHP has been implemented in Seattle since 2006, when it was funded and managed by the Business Partnership for Early Learning (BPEL) to serve 106

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families in its first year. The group of business leaders participating in BPEL grew the program to 160 families per year. United Way of King County took over the program in 2010 and has expanded it in both numbers and geography through partnerships with community-based agencies throughout King County. In 2015-16, PCHP will serve 1,200 families through nine agencies.

Annual third-party evaluation of this research-backed model has shown participant achievement of short-term outcomes related to school readiness, as reported by home visitors using validated observation tools. Outcome indicators among parents include increases from pre-program levels in communication, consistency, showing affection, and responsiveness; and among children include increases in independence, social cooperation, cognitive abilities, emotional stability, task orientation, and pre-literacy.

This report summarizes an evaluation of long-term outcomes across a diverse cohort of PCHP graduates.[1] Participants in this evaluation are predominately low income and families of color; 38% of the families identify as Asian, 33% identify as Black or African American, and 22% identify as Latino. Nearly the entire cohort (89%) is eligible for free or reduced lunch. In addition, nearly 80% of the participants speak a language other than English in their home. The evaluation examined the performance of PCHP graduates against a demographically matched comparison group on standardized assessments of school readiness, English proficiency, and Grade 3 academic performance. Three key findings are highlighted.

1 There was an earlier version of this report dated February 2016 (released on 2/4/2016) that had an inaccuracy. The third key finding stated that on Grade 3 reading and math achievement tests, PCHP graduates met state standard in reading and math at a higher percentage than state averages. This is true for math but not for reading.

Key Findings

PCHP is narrowing the preparation gap by increasing children's kindergarten readiness, English language proficiency, and academic performance.

1. **Increased Kindergarten Readiness.** The percentage of PCHP graduates assessed as "ready for kindergarten" in all six domains measured by the Washington Kindergarten Inventory of Developing Skills (WaKIDS) was significantly higher than the matched comparison group and higher than the state average. PCHP graduates also outperformed the matched comparison group within each of the six domains.

2. **Increased Kindergarten English Language Proficiency.** More PCHP graduates, compared to the comparison group, demonstrated higher levels of English proficiency on the Washington English Language Proficiency Assessment (WELPA) Placement Test; there was a significant difference in two of the four composite skill areas assessed. PCHP graduates also scored higher than the state average in each skill area assessed.

3. **Increased Grade 3 Academic Performance.** On Grade 3 reading and math standardized achievement tests (Measurements of Student Progress, or MSP), PCHP graduates significantly outperformed children in the comparison group. The percentage of PCHP graduates meeting the Grade 3 state standard in math was also higher than statewide percentages.

These results add to a growing body of evidence showing the effectiveness of PCHP in King County.

Methods

In this section we describe the long-term outcome measures used in this study, the steps taken to obtain individual-level school data and create the matched comparison group, and the analytic techniques or statistical tests used to compare outcomes between PCHP graduates and the comparison group.

Long-Term Outcome Measures

Kindergarten Readiness. The Washington Kindergarten Inventory of Developing Skills (WaKIDS) measures kindergarten readiness in six domains: Social Emotional, Physical, Language, Cognitive, Literacy, and Mathematics.[2] It is based on kindergarten teacher observations and ratings and is completed by the second month of school. Outcome indicators included domain scale scores and percent "ready for kindergarten"[3] by domain, as well as whether or not the student was ready for kindergarten in all six domains (13 indicators altogether).

Kindergarten English Language Proficiency. The Washington English Language Proficiency Assessment (WELPA) Placement Test is administered to all children entering kindergarten whose parents indicate on the state's Home Language Survey that the child's first language or most-used language is a language other than English. It establishes initial eligibility for English Language Development (ELD) services.[4] The test measures English language proficiency in four skill areas: Speaking (S), Listening (L), Reading (R), and Writing (W), as well as four combined or composite language skills areas: Oral (L + S), Literacy (R + W), Comprehension (L + R), and Productive (S + W). Outcome indicators included scale scores for each of the four skill areas, composite scores for each of the four combined skill areas, and the overall score, as well as whether or not each of these scores exceeded the scale or composite threshold for the higher two of four proficiency levels (18 indicators altogether).

Grade 3 Academic Performance. Measurements of Student Progress (MSP) was the standardized test used statewide with students in Grades 3 through 8 between 2010 and 2014. Outcome indicators included scale scores for Grade 3 reading and mathematics, as well as whether or not each score met the state standard for each of the two tests (four indicators altogether).

2 Only among students who were assessed on all six domains

3 WaKIDS defines "kindergarten ready" along a color-coded continuum; for further information see http://www.k12.wa.us/WaKIDS/

4 For further information see http://www.k12.wa.us/assessment/EL/PlacementTest.aspx

Obtaining Individual-Level School Data

To obtain individual-level school data for the purpose of selecting a matched comparison group and evaluating long-term outcomes, the following steps were taken:

- ORS Impact submitted a formal data request to the Washington Office of Superintendent of Public Instruction (OSPI), which was approved and resulted in a data sharing agreement.
- ORS Impact sent OSPI a list of all PCHP graduates from 2008 through 2013, for whom partner agencies had obtained active parental consent to access future student data (N=477). Each year the analysis will be able to add new cohorts as those children's ages correlate to kindergarten entrance.
- OSPI matched as many PCHP graduates as possible with individual student records (N=288).
- OSPI transferred to ORS Impact statewide, de-identified, individual-level demographic and standardized test data files corresponding to school years 2009-10 through 2013-14. The demographic files indicated which students were PCHP graduates.

Developing the Matched Comparison Group

To develop the matched comparison group, ORS Impact completed the following steps:

- Merged the data to create one file containing all demographic and outcome data for all students across all years. There were 214 PCHP graduates who were linked with data on any of the outcome indicators of focus in this analysis.
- Created dummy variables (0 or 1) that assigned each student to one of 56 groups, representing all possible configurations of the following demographic variables:
  - Ethnicity: Asian, African American or black, Hispanic or Latino, American Indian or Alaska Native, multiracial, Native Hawaiian or Pacific Island, and white
  - Home language: English or not
  - Free and reduced lunch program eligibility: eligible or not
  - Gender: male or female
- Created a variable that contained a random number between 1 and 50,000.
- For every PCHP graduate with at least some outcome data (n=214), selected three students (n=642) with the highest random number that matched the

graduate on the following characteristics:

- the demographic dummy variable,
- the year they entered kindergarten, and
- the configuration of outcome data available for them.

Analytic Techniques

To test differences in outcomes between PCHP graduates and the matched comparison group, we conducted the following tests:

- Independent-sample t-tests with indicators based on standardized scores
- Chi-square goodness-of-fit tests with indicators based on whether or not a particular threshold was achieved

This analysis also included calculating state averages for each assessment to serve as points of reference for the performance of PCHP graduates and the matched comparison group.

Rigor of Different Evaluation Designs

The most rigorous way to provide evidence of a program's effectiveness is a randomized experiment, sometimes referred to as the "gold standard." Evaluations like the current one—with a quasi-experimental design that uses a carefully matched control group—are less rigorous than those with an experimental design, but are a step forward on the rigor continuum from evaluations with non-experimental designs (i.e., those with no comparison group). With the current study's design we cannot rule out the possibility that observed differences in outcomes are attributable to characteristics on which PCHP graduates and the comparison group were not matched (e.g., caregiver characteristics related to registering for and completing the PCHP program). However, results of quasi-experimental studies still add substantially to the research base needed to justify the much more costly investment and the often fraught experience of implementing random assignment in a real-world setting required by an experimental evaluation.

Results

First we describe the participants comprising the PCHP graduates and the matched comparison group; then we summarize the results of statistical comparisons with the match comparison group. To provide point of references for PCHP graduates and the matched comparison group performance, we also include state averages for each performance indicator.

Participants

As in the wider population served by PCHP in King County, participants in this study are predominantly low-income families of color that do not speak English in their homes (see Table 1). Because each PCHP graduate was matched with three students on each demographic variable of interest, the demographic make-up of the comparison group is identical to that of the PCHP graduates, which strengthens the research design.

Table 1 | Demographic Characteristics of PCHP Graduates and Matched Comparison Group

	PCHP Graduates (n=214)	**Matched Comparison Group** (n=642)
Ethnicity		
Asian	38.3%	38.3%
Black/African American	33.6%	33.6%
Latino or Hispanic of any race	22.4%	22.4%
White	2.3%	2.3%
American Indian or Alaska Native	0.9%	0.9%
Native Hawaiian or Pacific Islander	0.5%	0.5%
Two or more races	1.9%	1.9%
English is home language	21.5%	21.5%
Eligible for Free and Reduced Lunch Program	89.3%	89.3%
Male	57.0%	57.0%

Long-Term Outcomes

Comparisons of PCHP graduates and the matched comparison group provide consistent evidence that PCHP increases kindergarten readiness, English language proficiency upon entering kindergarten, and Grade 3 academic performance.

Kindergarten Readiness

Significantly more PCHP graduates were assessed as ready for kindergarten in all six of the domains measured by WaKIDS (44.6% versus 29.6%, $p < .05$; see Figure 1). In five of the six domains, the proportion of PCHP graduates assessed as kindergarten ready exceeded proportions in the comparison group to at least a trend-level degree of statistical significance ($p < .15$). The difference was strongest in the Social Emotional domain, where over 10% more PCHP graduates were considered kindergarten ready.

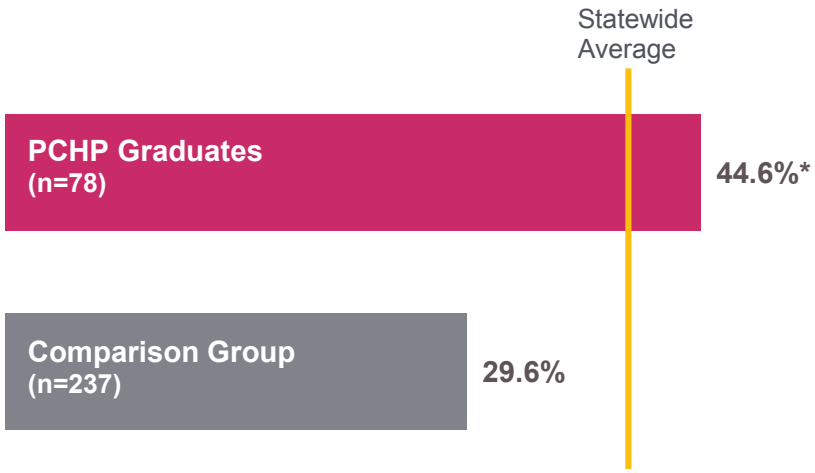
In the field of early learning, awareness of the importance of executive function skills to child development has been growing. Executive function skills include, "being able to focus, hold, and work with information in mind, filter distractions, and switch gears."[5] In order to develop executive function skills in children, experts recommend parents establish routines, model social behavior, create activities for their children that foster creative play and social connection, teach them how to cope with stress, and provide opportunities for directing their own actions.[6] Given this, PCHP graduates' strong growth in the Social Emotional domain suggest promise of future success.

When PCHP graduates were compared to the statewide average, their positive outcomes were evident. More PCHP graduates were assessed as ready for kindergarten in all six of the domains measured by WaKIDS (44.6% versus 40.0%; see Table 2).

5 "Executive Function and Self-Regulation." Center on the Developing Child at Harvard University. 2015

6 "Executive Function and Self-Regulation."

Figure 1 | Percent Ready for Kindergarten in All Six Domains



*p<.05

Table 2 | Kindergarten Readiness Outcomes (WaKIDS)

	Average WaKIDS Scale Scores			Percent Ready for Kindergarten		
	PCHP Graduates (n=78)	Comparison Group (n=237)	Statewide Average (n=58,383)	PCHP Graduates (n=78)	Comparison Group (n=237)	Statewide Average (n=58,383)
K-ready in all 6 domains	NA	NA	NA	**44.6%***	29.6%	40.0%
Social Emotional	**639.7‡**	622.0	633.6	**78.2%***	66.2%	73.9%
Physical	**638.0***	621.2	626.8	**84.2%‡**	76.1%	80.2%
Language	**617.4†**	593.7	625.2	**66.2%‡**	56.6%	70.0%
Cognitive	627.7	623.9	640.3	**76.9%†**	66.4%	74.4%
Literacy	630.9	625.9	640.0	75.0%	68.5%	76.3%
Mathematics	634.0	624.5	637.0	**55.1%†**	43.5%	54.4%

****p < .001, **p < .01, *p < .05,*
†p < .10 (marginally significant),
‡p < .15 (trend-level significance);
bolded=higher to at least a trend-level degree of statistical significance

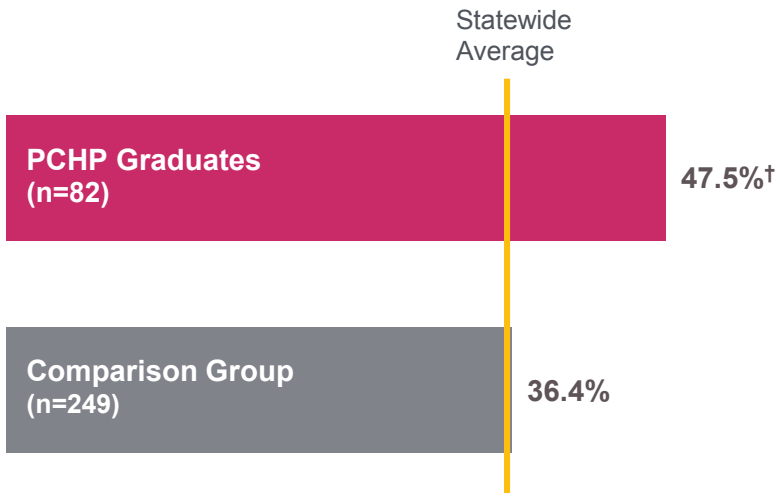
Kindergarten English Language Proficiency

More PCHP graduates demonstrated a higher level of English proficiency upon entry into kindergarten, as measured by the WELPA Placement Test (47.5% versus 36.4%, $p < .10$; see Figure 2). The difference was strongest in the Productive skills area (a combination of the Speaking and Writing skills areas), where close to 20% more PCHP graduates scored above the "Advanced" threshold for English language proficiency ($p < .01$; see Table 3 on the following page).

When PCHP graduates were compared to the statewide average, they met or outperformed state averages in all but the Oral skills area (Listening and Speaking).

Although evidence indicates that dual language learning enhances social emotional and cognitive development, students who enter school as English language learners face unique challenges compared to their peers because the time spent learning English can reduce the emphasis on math and reading.[7] The fact that PCHP graduates enter kindergarten with stronger English speaking and writing skills than their peers further indicates PCHP's ability to close the preparation gap.

Figure 2 | Percent Reaching Level Advanced (Level 3) or Transitional (Level 4) Overall



†p < .10 (marginally significant)

7 Goldenberg, Claude, et al. Dual Language Learners: Effective Instruction in Early Childhood. American Educator, 2013.

Table 3 | Kindergarten English Language Proficiency Outcomes (WELPA)

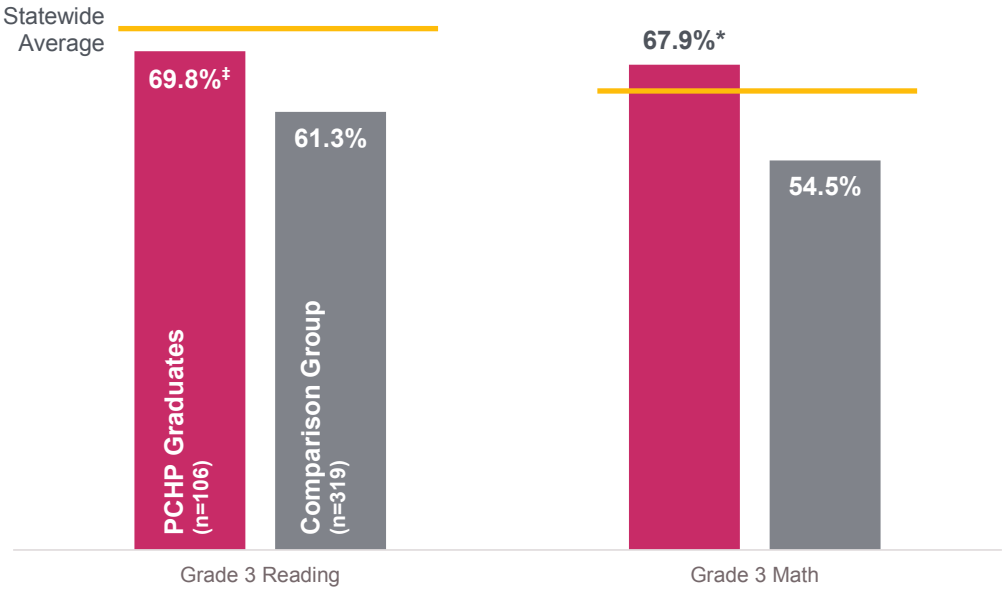
	Average WELPA Scale Scores			Percent Advanced (Level 3) or Transitional (Level 4)		
	PCHP Graduates (n=82)	**Comparison Group** (n=249)	**Statewide Average** (n=58,383)	**PCHP Graduates** (n=82)	**Comparison Group** (n=249)	**Statewide Average** (n=58,383)
Overall	404.0	396.8	395.1	**47.5%†**	36.4%	36.0%
Speaking (S)	471.3	467.1	467.3	45.7%	40.3%	43.0%
Listening (L)	434.4	436.8	435.3	45.7%	46.6%	44.2%
Reading (R)	370.9	364.3	361.2	53.1%	45.0%	42.2%
Writing (W)	**339.3†**	321.2	317.3	**19.5%†**	11.3%	10.4%
Comprehension (L+R)	398.2	397.7	395.3	50.6%	46.4%	44.1%
Productive (S+W)	**404.6‡**	392.8	392.8	**41.8%****	22.6%	27.4%
Oral (L+S)	454.6	454.3	452.7	42.5%	43.7%	44.4%
Literacy (R+W)	351.8	342.3	340.1	**38.2%***	22.5%	25.9%

****p < .001, **p < .01, *p < .05,*
†p < .10 (marginally significant),
‡p < .15 (trend-level significance);
bolded=higher to at least a trend-level degree of statistical significance

Grade 3 Academic Performance

PCHP graduates scored significantly higher on Grade 3 reading and math achievement tests than the comparison group (MSP; $p < .05$; see Figure 3). Furthermore, over 10% more PCHP graduates met Grade 3 standards for math ($p < .05$) and close to 10% more met Grade 3 standards for reading, when compared to their peers (see Table 4). The percentage of PCHP graduates meeting Grade 3 standard in math is also higher than for students statewide.

Figure 3 | Percent Met Grade 3 Standard on MSP



**p < .05, ‡p < .15 (trend-level significance)*

Table 4 | Academic Performance Outcomes (MSP)

	Average MSP Scale Scores			Percent Met Grade 3 Standard		
	PCHP Graduates (n=106)	**Comparison Group** (n=319)	**Statewide Average** (n=58,383)	**PCHP Graduates** (n=106)	**Comparison Group** (n=319)	**Statewide Average** (n=58,383)
Grade 3 Reading	**410.1***	402.8	412.5	**69.8%‡**	61.3%	72.8%
Grade 3 Math	**410.4***	401.2	408.7	**67.9%***	54.5%	64.3%

****p < .001, **p < .01, *p < .05, †p < .10 (marginally significant), ‡p < .15 (trend-level significance); bolded=higher to at least a trend-level degree of statistical significance*

Conclusion

PCHP in King County reaches children who are most at risk of school failure: 90% of participating children are below the federal poverty line (as measured by eligibility for free and reduced lunch) and for almost 80%, English is not their primary language (See Table 1).

Since 2006 when PCHP was first implemented in King County, program assessment data has consistently shown that children who participated in the full two-year program cycle experienced significant positive changes in skills and behaviors that have been shown to lead to greater school readiness and to help close the preparation gap. This long-term follow up study provides evidence that the benefits persist beyond the time period of the home visits, at least well into the elementary school years.

PCHP Narrows the Preparation and Achievement Gaps

On every kindergarten readiness measure studied, PCHP graduates performed stronger than a matched group of peers and on most measures, scored higher than the statewide average. This news is particularly exciting in light of research that shows children from low-income families, on average, start kindergarten 12 to 14 months behind their peers in pre-literacy and language skills.[8] Remarkably, Grade 3 reading and math scores were also higher for PCHP graduates as compared to their peers, and more PCHP graduates met Grade 3 standards in math than the statewide overall average. These findings indicate that early gains are sustained as children progress through school.

PCHP is a Worthy Investment

The evidence shows that PCHP graduates in King County are starting school more prepared and performing well in elementary school. Investment in PCHP in King County has an average program cost of $8,000-$9,000 per child, but the proven social and economic benefits suggest a high return on the initial

8 A Matter of Equity: Preschool in America. U.S. Department of Education April 2015.

investment. Independent studies of PCHP participants across the country have demonstrated they are less likely to need special education services,[9] are more likely to graduate from high school, and have increased their lifetime earning potential.[10]

Next Steps

We anticipate that future evaluation of PCHP in King County will attempt to replicate kindergarten readiness outcomes and extend the analysis through later grades as more PCHP graduates advance through school. It may also be possible to explore other variables, such as enrollment in special education services and school attendance. Eventually even high school graduation rates will be available as PCHP graduates progress through school.

9 High-Quality Early Learning: Cutting Crime and Saving Washington Up to $240 Million a Year in Education Costs. Fight Crime: Invest in Kids newsletter downloaded from http://www.fightcrime.org on February 2, 2016.

10 Bartik, Timothy J., "The Economic Development Effects of Early Childhood Programs." A report for the Partnership for American's Economic Success. 2008.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