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# ECEAP Participation and Kindergarten Readiness among Hispanic Children in Washington State

Authored by  
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## ABOUT THE ERDC

The research presented here utilizes data from the Education Research and Data Center (ERDC), located within the Washington Office of Financial Management (OFM). ERDC works with partner agencies to conduct powerful analyses of learning that can help inform the decision-making of Washington legislators, parents, and education providers. ERDC's data system is a statewide longitudinal data system that includes de-identified data about people's preschool, educational, and workforce experiences.

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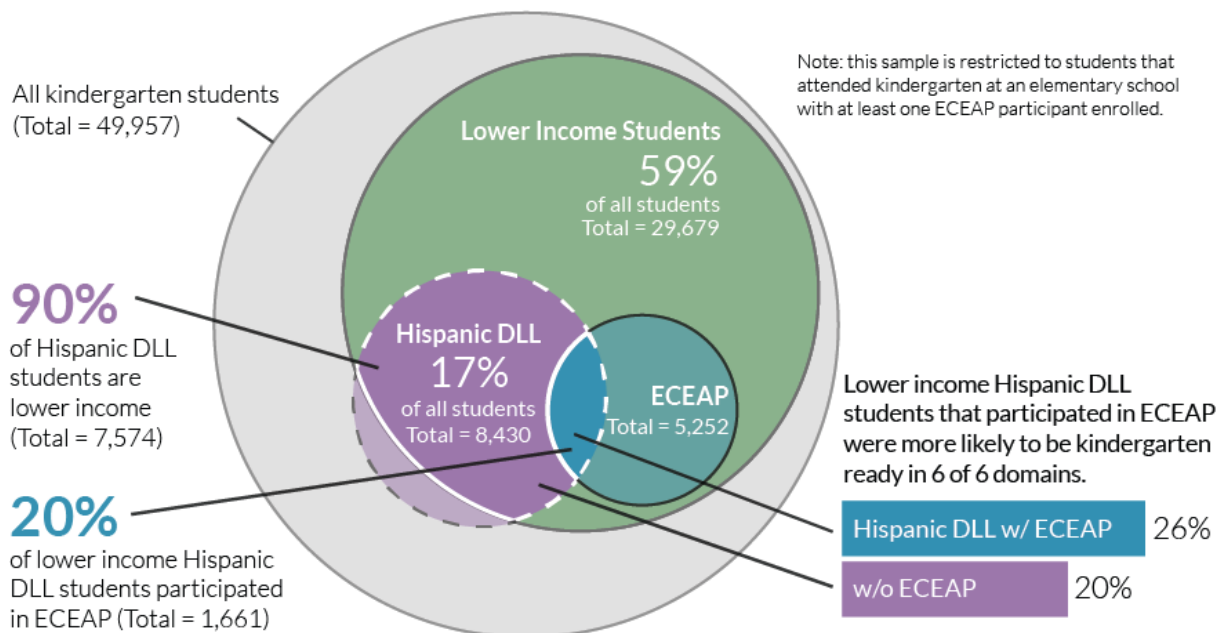
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## Executive Summary

This report looks at the relationship between participation in the Early Childhood Education and Assistance Program (ECEAP) and performance on the Washington Kindergarten Inventory of Developing Skills (WaKIDS) with a focus on Hispanic children. This study was conducted because Hispanic children in general and Hispanic DLLs represent a sizeable proportion of the lower-income student population in Washington.

### Key Findings

- Hispanic students and Hispanic dual language learners were over-represented among former ECEAP and lower-income kindergarten students in Washington state in 2015-16.
- When looking at lower-income students, ECEAP participation was associated with a greater increase in kindergarten readiness for Hispanic children compared to non-Hispanic children, and for Hispanic DLLs compared to Hispanic native-English speakers.
- The proportion of Hispanic DLLs enrolled in ECEAP is positively correlated with the proportion of Hispanic DLLs who are kindergarten ready at the county level.



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## Introduction

Kindergarten readiness is an indicator of later success in school. Quality early childhood education (ECE) contributes to kindergarten readiness and persistent gains in school achievement for all children, including those at greater risk for school failure (Ansari & Winsler, 2013; Brooks-Gunn, 2003; Camilli, et al., 2010; Frede, et al., 2009; Herman-Smith, 2013; Kay & Pennucci 2014a and 2014b; Ramey, et al., 2000; U.S. Executive Office of the President, 2014; Vandell, et al., 2010; Winsler, et al., 2008; Zhai, Brooks-Gunn & Waldfogel, 2011). Kindergarten readiness, in turn, can help mitigate the relationship between race/ethnicity, immigrant status, poverty and subsequent school success (Davoudzadeh, McTernan & Grimm, 2015; Gaynor, 2015). However, only 63 percent of eligible children in Washington were able to access Head Start or its state-funded equivalent, Early Childhood Education and Assistance Program (ECEAP) in 2014-15 (DEL, 2016).

### Hispanic communities in Washington

Washington is home to a large and growing Hispanic community.<sup>1</sup> The population of Hispanic children served by the public school system increased from under 14 percent in 2005-06 to over 22 percent in 2015.<sup>2</sup> However, as in other parts of the United States, Hispanic children in Washington lag behind their white peers on numerous measures of academic success.

According to a recent report, Hispanics scored lower than white and Asian students on a range of standard academic measures (Education Research and Data Center, 2013). Evidence suggests that these gaps emerge early, with Hispanic families less likely than white families to take advantage of critical public services, such as quality preschool programs, that have been shown to support positive development (Fuller & Kim, 2011; Garcia & Miller, 2008; Washington State League of Education Voters, 2011). By early elementary school, Hispanic children score substantially lower than their white peers on measures of reading and mathematics (Fryer & Levitt, 2004). These gaps grow over time, setting some Hispanic children on an educational trajectory that may lead to substantial challenges in later adolescence and into adulthood (Child Trends, 2012; Hehir, et al. 2012; Reardon, 2011; Wallace et al. 2008).

### Center-based care and immigrant communities

Past research suggests that Hispanic families in the United States use center-based care less than white Americans (Coley, et al, 2014; Gormley, 2008; Votruba-Drzal, et al., 2015). Furthermore, Hispanic families often differ in their use of center-based child care according to

1. According to the US Census definition, Hispanics or Latinos are those who classify themselves as Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.

2. See the Washington State Report Card from the Office of Superintendent of Public Instruction (OSPI).

their country of origin, with Mexican immigrants the least likely to choose out-of-home care (Coley, et al, 2014). English proficiency is also associated with the choice of center-based care for all immigrant groups, unless there are sufficient non-English center-based care options in the community (Miller, et al, 2014). Finally, Burchinal, et al. (2008) found that immigrant groups living in urban areas with dense social networks were less likely to use center-based care in favor of family or relative care. The authors attributed this finding not to convenience but to a more general lack of shared values and trust in the larger community. In other words, among immigrant and similar subpopulations the choice to use a center-based program is related to trust in, as well as access to, services in the community (Coley, et al., 2014).

While Hispanic children, particularly the children of immigrants, may be less likely to attend center-based preschool, Gormley (2008) found that Hispanic children whose parents spoke Spanish at home experienced substantial improvements in virtually all academic areas compared to children who did not attend preschool. Moreover, the same study found that the benefits of center-based care for the children of Mexican immigrants was even greater than those found among other Hispanic immigrant groups. A later study likewise concluded that quality ECE benefitted the children of Spanish-speaking immigrants more than the children of non-immigrant parents (Votruba-Drzal, et al, 2015).

## ECEAP and kindergarten readiness

The present analysis is an extension of a larger study on the relationship between kindergarten readiness and state-funded preschool participation statewide (Coker, 2017). The results of the statewide study showed that incoming kindergartners in 2015-16 who had been enrolled in the state-funded Early Childhood Education and Assistance Program (ECEAP) for at least six months the previous year were significantly more likely to be “kindergarten ready” than lower-income students who had not participated in ECEAP (see Table A1, Appendix A). In other words, there is a correlation between being a former ECEAP participant and being kindergarten ready compared to a non-ECEAP participant. This relationship was apparent across racial/ethnic groups and other subpopulations, but was especially pronounced among Hispanic students and dual language learners (DLLs).

## Study design

### Research questions

The specific research questions of this study are as follows:

- For those in ECEAP, how does kindergarten readiness for Hispanic and dual language learners compare to those for English speakers or children of other race/ethnicities?
- Are there any external factors that might influence the relationship between ECEAP participation and kindergarten readiness for these subgroups in particular?

- To what extent are Hispanic and DLLs overrepresented in the lower-income and ECEAP populations?

## Cohort and comparison groups

The data used this analysis included administrative data for children enrolled in ECEAP in Washington during the 2014-15 school year, linked to their WaKIDS<sup>3</sup> assessment scores in the fall of 2015. The final study population consisted of the 5,252 children who participated in ECEAP in the 2014-15 school year, were enrolled in kindergarten the following year, and were assessed on the WaKIDS in the fall of 2015, referred to hereafter as the “ECEAP cohort.”

The comparison groups included the entire statewide population of kindergartners in 2015-16 who were assessed on the WaKIDS and had attended an elementary school also attended by a former ECEAP student. This population was divided into the “lower-income” cohort, identified as those eligible for free or reduced price lunch (FRPL) and the “higher-income” cohort, who were not FRPL eligible (refer to technical notes for more details on the study design, data linkage, and population).

While this comparison group offers useful context, it has limitations: First, we do not know which children received services through Head Start or private preschool, or were in high quality child care. In addition, the use of FRPL as a proxy for lower income is imprecise. The experiences of children who qualify for ECEAP (mostly below 110 percent federal poverty level) may be different from those who qualify for FRPL (up to 185 percent federal poverty level).

The outcomes of interest included “readiness flags” in each of the six WaKIDS domains; social emotional, physical, language, cognitive, literacy, and math, and a flag indicating that they were kindergarten ready all six WaKIDS domains. A child is flagged as “ready” in a given domain when s/he achieves a certain score on the combined objectives comprising the domain in question.

## Findings

Finding 1. Hispanic students and Hispanic dual language learners were overrepresented among former ECEAP and lower-income kindergarten students in Washington in 2015-16.

Hispanic students made up 46 percent of the ECEAP cohort, compared to 39 percent of the non-ECEAP lower-income group and just 14 percent of the higher-income group (see Figure 1). These numbers suggest that Hispanics are over-represented both in the

3. The “WaKIDS” is the Washington state assessment of kindergarten readiness. Refer to the technical notes for more detail, or visit this website for more information: <http://www.k12.wa.us/WaKIDS>



ECEAP population as well as within the lower-income group. Almost 30 percent of the entire kindergarten cohort used in the present study were Hispanic. In contrast, approximately 22 percent of the overall statewide K-12 student population and 24 percent of all incoming kindergartners were of Hispanic ethnicity in 2014-15.<sup>4</sup>

The ECEAP cohort also had a higher than expected proportion of students enrolled in Washington’s transitional bilingual program for dual language learners (DLLs). Thirty-nine percent of the ECEAP cohort were DLLs, compared to 33 percent of lower-income kindergartners and only 10 percent of the higher-income group.

**Total sample and comparison group size**



**Demographic characteristics**

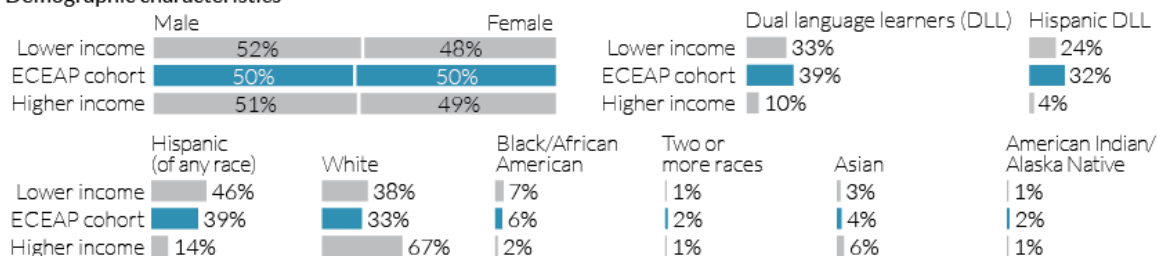


Figure 1. Size and demographics of the ECEAP cohort compared to the non-ECEAP lower and higher-income cohorts (see also Table A2).

Figure 2 presents a breakdown of race/ethnicity for DLLs only. The proportions represent race/ethnicity as a percentage of DLLs in each cohort. As this shows, 81 percent of former ECEAP DLL students and 72 percent of non-ECEAP lower-income DLLs were of Hispanic origin. In contrast, Hispanic students made up only 44 percent of all DLLs in the higher-income group. The higher-income group also had much higher proportions of Asians and white students among their DLL population. In total, 32 percent of the

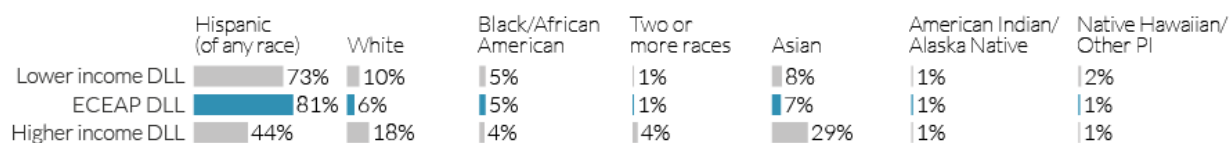


Figure 2. Breakdown of dual language learners by race/ethnicity, compared with non-ECEAP lower and higher-income dual language learners (see also Table A3).

4. See the **Washington State Report Card** from OSPI.



ECEAP cohort were Hispanic DLLs compared to 24 percent of the lower-income cohort and only 4 percent of the higher-income cohort.

Statewide, 59 percent of 2015-16 kindergartners were eligible for FRPL and/or had been enrolled in ECEAP (i.e., were lower income). However, 81 percent of the Hispanic subpopulation were lower income (by the same criteria), 84 percent of DLLs, and 90 percent of Hispanic DLLs (see Table A3).

Finding 2. ECEAP participation was associated with a greater increase in kindergarten readiness for Hispanic compared to non-Hispanic children, and for Hispanic DLLs compared to native-English speakers

The remainder of the findings presented here refer only to the ECEAP and lower-income cohorts – the higher-income cohort was excluded entirely from all of the following analyses. The results of the statewide report showed that higher-income students virtually always outperform lower-income students, defined by eligibility for Free or Reduced Price Lunch (FRPL). The kindergarten readiness rates of former ECEAP students were notably higher than those of lower-income students who had not attended ECEAP, but rarely reached the level of the higher-income students (Coker, 2017).

The following sections will first compare the combined results for the ECEAP and lower-income groups in order to demonstrate the overall performance of the subpopulations of interest relative to others. The differences in performance between the ECEAP and non-ECEAP lower-income cohorts with each subpopulation are then compared and presented.

### *Hispanic students*

Across the ECEAP and lower-income cohorts combined, lower-income Hispanic students were as likely to be kindergarten ready in the social emotional and physical domains as children from any other racial or ethnic group. Hispanics also performed almost as well as their peers in the cognitive domain (see Table A3). On the other hand, Hispanic students were significantly less likely than children of any other race/ethnicity to be kindergarten ready in language, literacy, math, and six of six domains ( $X^2$  sig  $p < .001$ ) (See Figure 3).

However, ECEAP participation was associated with a greater absolute *increase* in kindergarten readiness among Hispanic children than among any other racial/ethnic group. Table A6 presents the proportions of former ECEAP compared to lower-income non-ECEAP children who were kindergarten ready in each domain and in six of six domains, separately for Hispanics, whites, and “other” races.<sup>5</sup> To reiterate, the ECEAP difference

5. An “other” category was created consisting of Black/African Americans, American Indian/Alaska Natives, Native Hawaiians and other Pacific Islanders, and Asians. These four categories were merged

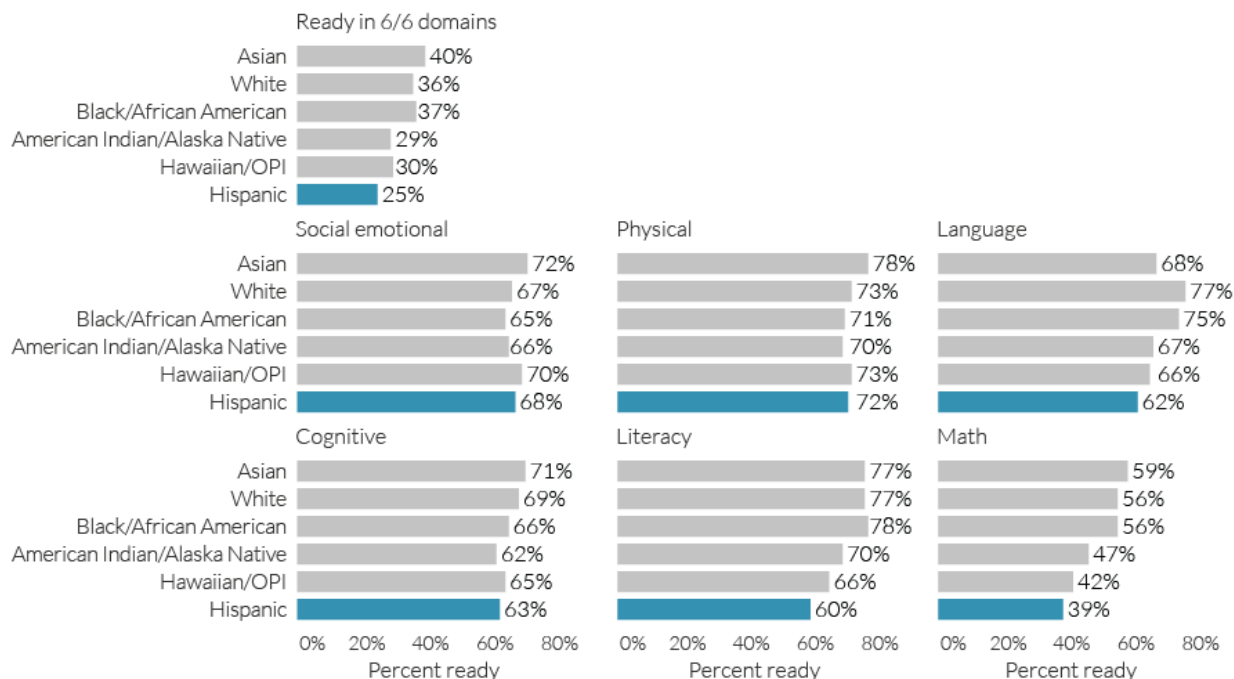


Figure 3. The relationship between race/ethnicity and kindergarten readiness for lower-income and ECEAP cohorts combined (see also Table A5).<sup>7</sup>

refers to the relative increase in the proportion of ECEAP compared to non-ECEAP lower-income children who were kindergarten ready in each domain<sup>6</sup>.

Within the Hispanic population only, former ECEAP participants were significantly more likely than their non-ECEAP counterparts to be kindergarten ready in every domain and in six of six domains ( $X^2$  sig  $p < .001$ ). Among white children, on the other hand, ECEAP participation was associated with a statistically significant increase in kindergarten readiness only in the physical, cognitive, literacy and math domains ( $p < .001$ ).

The relative size of this increase varied in size across domains and ethnic/racial categories. Figure 4 shows that among lower-income Hispanics, twenty-five percent *more* ECEAP participants than non-participants were ready in six of six domains, compared to eight percent more white ECEAP participants and 15 percent more in the “other race”

because they were relatively small. “Two or more races” was excluded because it did not provide enough information for comparison.

6. The size of the ECEAP difference was then calculated as the proportion of additional children who were kindergarten ready in the ECEAP compared to the lower-income group ((ECEAP proportion ready – lower-income proportion ready)/lower-income proportion ready).

7. The category “two or more races” is left out because it is difficult to directly compare with the other categories. Social emotional sig  $p < .01$ ; all other domains and 6/6 sig  $p < .001$ .

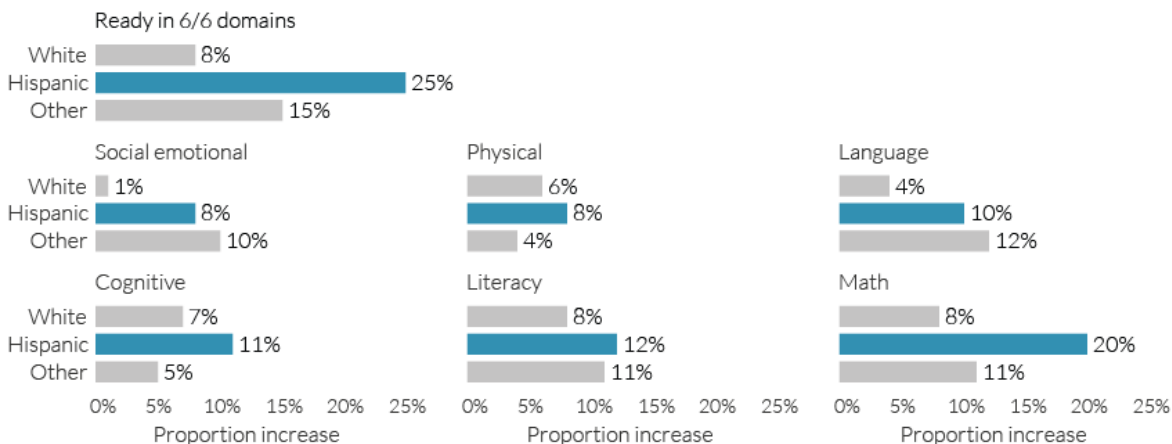


Figure 4. The proportion increase in kindergarten readiness among the ECEAP cohort compared to their low-income counterparts for White, Hispanic, and “Other” (see also Table A6).

category. The ECEAP differences were greatest for Hispanic students in the cognitive, literacy, and math domains, and in six of six domains.

*Hispanic dual language learners*

Hispanic DLLs were compared to Hispanic English speakers in order to explore the intersection of Hispanic ethnicity, DLL status and ECEAP participation on kindergarten readiness. Figure 5 and Table A7 present the combined proportions of lower-income and ECEAP Hispanic English speakers compared to Hispanic DLLs who were kindergarten ready in each domain and 6 of 6 domains. As this shows, in the social emotional and physical domains, there no difference in the kindergarten readiness of Hispanic DLLs and Hispanic native English speakers. However, English speakers significantly outperformed DLLs in the language, cognitive, literacy, math, and six of six domains ( $X^2$  sig,  $p < .001$ ).

The above findings suggest that, as a group, Hispanic English speakers have an advantage over Hispanic DLLs in kindergarten readiness. However, just as ECEAP participa-

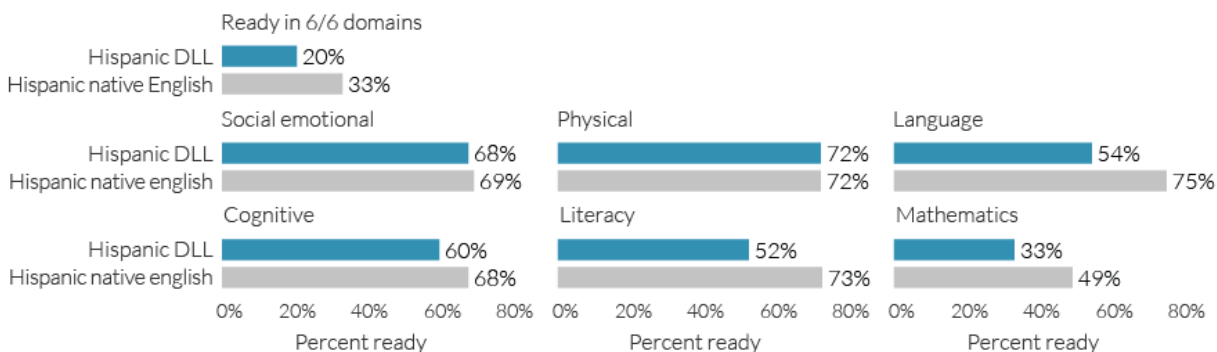


Figure 5. The proportion of Hispanic dual language learners who were kindergarten ready by domain compared to Hispanic English speakers, for ECEAP and lower-income cohorts combined (see also Table A7).

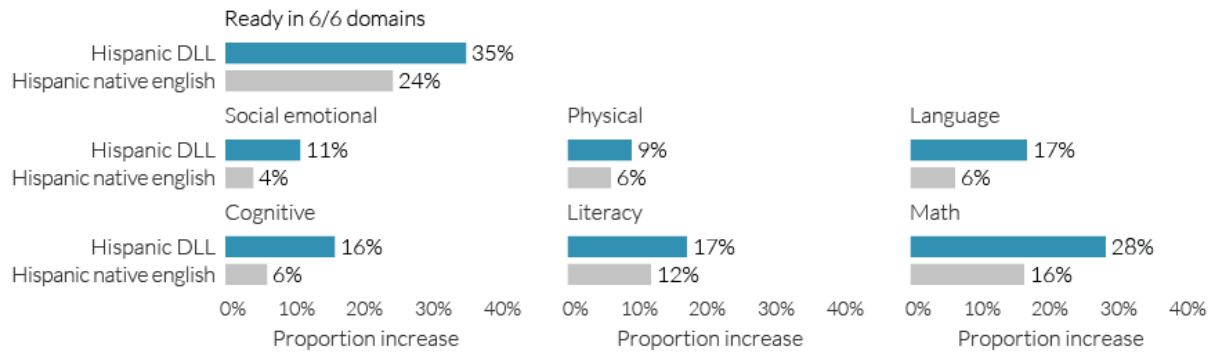


Figure 6. The percent **increase** in kindergarten readiness for Hispanic DLL compared to non-DLL Hispanic students only (see also Table A8).

tion was associated with greater benefit for Hispanics compared to other race/ethnicities, it was also associated with a greater benefit to Hispanic DLLs compared to Hispanic English speakers.

The difference in kindergarten readiness between ECEAP and lower-income cohorts was compared for Hispanic English speakers and Hispanic DLLs. When Hispanic English speakers were considered separately, the differences between the ECEAP and lower-income group fail to reach statistical significance in the social emotional, physical and cognitive domains, and are only marginally significant ( $p < .01$ ) in the language domain. On the other hand, the differences between the ECEAP and lower-income group for Hispanic DLLs was highly significant across all domains ( $p < .001$ ) (Table A8).

In other words, Hispanic DLLs who participated in ECEAP outperformed their non-ECEAP peers to a greater extent than native English Hispanic ECEAP students. The results suggest that ECEAP participation may be associated with increased outcomes for lower-income Hispanic children who are recent immigrants and/or still struggle with the English language. Given these findings, the final section will explore the degree to which Hispanic DLLs are able to access ECEAP services compared to other subpopulations.

**Finding 3.** At the county level, the proportion of Hispanic DLLs enrolled in ECEAP is positively correlated with the proportion of Hispanic DLLs who are kindergarten ready.

The central and eastern farming regions of Washington are more likely to be home to migrant workers of Hispanic origin, while immigrants from other countries tend to cluster in larger urban areas such as Seattle or Tacoma. The map on the left side of Figure 7 shows each county in Washington shaded according to the relative proportion of lower-income kindergartners in the present study who were Hispanic dual language learners (only counties that had more than 25 total Hispanic DLLs among their lower-income popula-

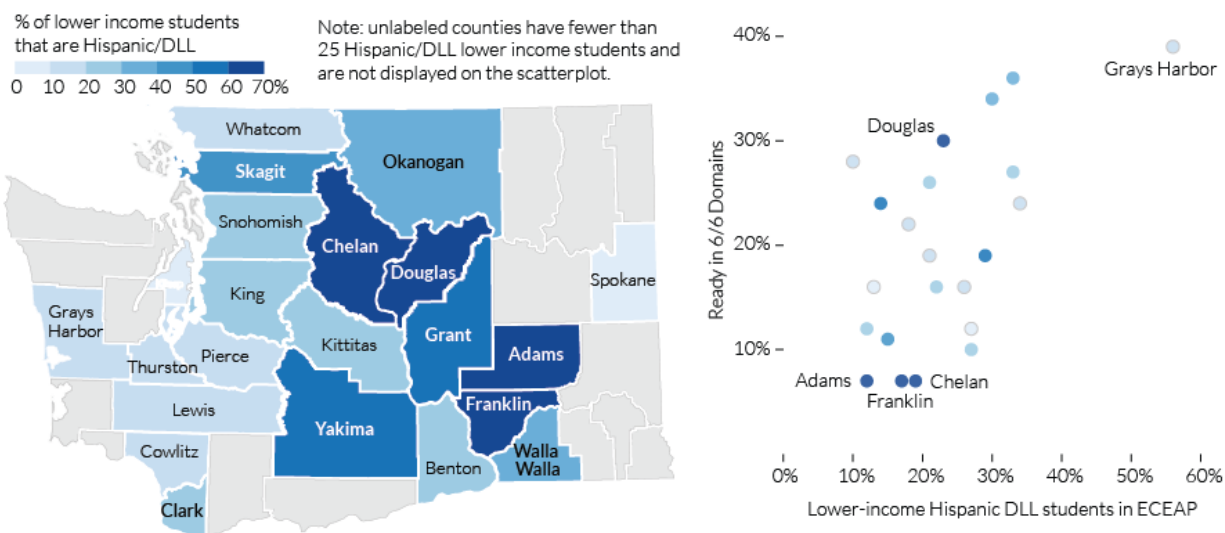


Figure 7. The proportion of lower income students that are Hispanic DLL in each county, and the relationship between Hispanic DLL students in ECEAP and Hispanic DLL students kindergarten ready in 6/6 domains (see also Table A9).

tion were included). Statewide, Hispanic DLLs represented a little over a quarter of the lower-income kindergarten population in 2015-16, with considerable variability between counties. Hispanic DLLs made up between 60 and 70 percent of the entire lower-income kindergarten population in Chelan, Douglas, Adams, and Franklin counties.

Among counties with 25 or more lower-income Hispanic DLLs, there was a moderately high positive correlation between the total proportion of Hispanic DLLs who were enrolled in ECEAP and the total proportion of Hispanic DLLs who were kindergarten ready in six of six domains ( $r = .58, p < .001$ ). The graph on the right of Figure 7 plots this relationship, with the dots shaded according to the overall proportion of Hispanic DLLs in the county. The horizontal axis represents the proportion of lower-income Hispanic DLLs enrolled in ECEAP, while the vertical axis shows the proportion of the same group who were kindergarten ready in six of six domains (see Table A9 for details). The trend is that counties with higher rates of Hispanic DLLs enrolled in ECEAP also have higher rates of Hispanic DLLs who are kindergarten ready in 6 of 6 domains.

## Discussion

Hispanic children represented 46 percent of the entire cohort of former ECEAP participants, and Hispanic DLLs represented 32 percent. The results showed that among Hispanic students in general (and Hispanic DLLs in particular), ECEAP participation was associated with higher rates of kindergarten readiness compared to lower-income

Hispanic and DLL students who had not attended ECEAP. Furthermore, the difference in kindergarten readiness associated with ECEAP participation was substantially larger for Hispanics compared to non-Hispanics, and for Hispanic DLLs compared to for any other subset of students.

The positive association of ECEAP participation with kindergarten readiness highlights the importance of ECEAP and other quality early learning programs in the ongoing effort to narrow the opportunity gap. This is especially true of the Hispanic DLL population (who represent around one quarter of all lower-income kindergarteners in Washington), where the association is even more pronounced.

Finally, the positive relationship between ECEAP enrollment and kindergarten readiness is apparent even at the county level. Counties differ in both the proportion of lower-income students who are Hispanic DLLs and the proportion enrolled in ECEAP, which suggests regional differences in access to ECEAP services across the state. Those differences are related, in turn, to regional differences in kindergarten readiness. While many factors may contribute to these discrepancies, the results point clearly to the need for more research on this topic.

## References

- Ansari, A. & Winsler, A. (2013). Stability and sequence of center-based and family child-care: Links with low-income children's school readiness. *Children and Youth Services Review*, 35: 358-366.
- Brooks-Gunn, J. (2003). Do you believe in Magic?: What we can expect from early childhood intervention programs. *Social Policy Report: Giving Child and Youth Development Knowledge Away*. XVII(1).
- Burchinal, M., Nelson, L., Carlson, M. & Brooks-Gunn, J. (2008). Neighborhood characteristics and child care type and quality. *Early Education and Development*, 19(5): 702-725.
- Camilli, G., Vargas, S., Ryan, S. & Barnett, W.S. (2010). Meta-analyses of the effects of early education interventions on cognitive and social development. *Teachers College Record* 112(3): 579-620.
- Coker, E.M. (2017) Kindergarten readiness among children who participated in the Washington State Childhood Education and Assistance Program .
- Coley, R.L., Votruba-Drzal, E., Collins, M.A. & Miller, P. (2014). Selection into early education and care settings: Differences by developmental period. *Early Childhood Research Quarterly*, 29: 319-332.
- Davoudzadeh, P., McTernan, M.L. & Grimm, K.J. (2015). Early school readiness predictors of grade retention from kindergarten through eighth grade: A multilevel discrete-time survival analysis approach. *Early Childhood Research Quarterly*. 32: 183-0192.
- Department of Early Learning (2016). 2014-15 Head Start and ECEAP Saturation Study. Washington State Department of Early Learning.
- Education Research and Data Center (2013). Key Education Indicators: A Compendium. April 2103. [http://www.erdcenter.org/indicators/pdf/erdcenter\\_compendium2013.pdf](http://www.erdcenter.org/indicators/pdf/erdcenter_compendium2013.pdf).
- Frede, E., Jung, K., Barnett, W.S. & Figueras, A. (2009). The APPLES blossom: Abbott Preschool program longitudinal effects study (APPLES). Preliminary results through 2nd Grade. Interim Report. National Institute for Early Education Research. [http://nieer.org/pdf/apples\\_second\\_grade\\_results.pdf](http://nieer.org/pdf/apples_second_grade_results.pdf)
- Fryer, R. G., & Levitt, S. D. (2006). The black-white test score gap through third grade. *American Law and Economics Review*, 8(2), 249-281
- García, E. E., & Miller, L. S. (2008). Findings and recommendations of the national task force on early childhood education for Hispanics. *Child Development Perspectives*, 2(2), 53-58.
- Gaynor, A.K. (2015). Development toward school readiness: A Holistic Model. *Journal of Education*. 195(3): 27-40.



- Gingerich, M. (2014). WaKIDS Preliminary Summary and Analysis. Third Sector Intelligence, Inc., Bill and Melinda Gates Foundation.
- Gormley, W.T. (2008). The effects of Oklahoma's pre-K program on Hispanic Children. *Social Science Quarterly*, 89(4): 916-936.
- Hehir, T., Grindal, T., & Eidelman, H. (2012). Review of special education in the Commonwealth of Massachusetts. Retrieved from <http://www.doe.mass.edu/sped/2012/0412sped.docx>
- Herman-Smith, R. (2013). Do preschool programs affect social disadvantage? What social workers should know. *Social Work*. 58(1): 65-73.
- Kay, N., & Pennucci, A. (2014a). Early childhood education for low-income students: A review of the evidence and benefit-cost analysis (Doc. No. 14-01-2201). Olympia: Washington State Institute for Public Policy.
- Kay, N., & Pennucci, A. (2014b). Outcome evaluation of Washington State's Early Childhood Education and Assistance Program. (Doc. No. 14-12-2201). Olympia: Washington State Institute for Public Policy.
- Miller, P., Votruba-Drzal, E., Coley, E.L. & Koury, A.S. (2014). Immigrant families' use of early childcare: Predictors of care type. *Early Childhood Research Quarterly*. 29: 484-498.
- Ramey, C.T., Campbell, F.A., Burchinal, M., Skinner, M.L, Gardner, D.M. & Ramey, S.L. (2000). Persistent effects of early childhood education on high-risk children and their mothers. *Applied Developmental Science*, 4(1-2), 2-14.
- Reardon, S. F. (2011). The widening academic achievement gap between the rich and the poor: New evidence and possible explanations. *Whither opportunity*, 91-116.
- U.S. Executive Office of the President. *The Economics of Early Childhood Investments*. December, 2014.
- Vandell, D.L, Belsky, J., Burchinal, M., Steinberg, L. & Vandergrift, N. (2010). Do effects of early child care extend to age 15 years? Results from the NICHD study of early child care and youth development. *Child Development*, 81(3): 737-756.
- Votruba-Drzal, E., Coley, R.L., Collins, M. & Miller, P. (2015). Center-based preschool and school readiness skills of children from immigrant families. *Early Education and Development*, 26: 549-573.
- Wallace Jr, J. M., Goodkind, S., Wallace, C. M., & Bachman, J. G. (2008). Racial, ethnic, and gender differences in school discipline among US high school students: 1991-2005. *The Negro Educational Review*, 59(1-2), 4.
- Washington State League of Education Voters, (2011). *Washington's Achievement Gap*.

Policy Brief.

- Winsler, A., Tran, H., Hartman, S.C., Madigan, A.L., Manfra, L. & Bleiker, C. (2008) School readiness gains made by ethnically diverse children in poverty attending center-based childcare and public school pre-kindergarten programs. *Early Childhood Research Quarterly*. 23: 314-329.
- Zhai, F., Brooks-Gunn, J. & Waldfogel, J. (2011). Head Start and Urban Children's School Readiness: A birth cohort study in 18 cities. *Developmental Psychology*, 47(1): 134-152.

## Appendix A. Data Tables

Table A1. Proportion of children who were kindergarten ready in six of six domains (entire ECEAP cohort and comparison groups).

	ECEAP	Higher income	Lower income
Social Emotional	71%	79%	67%
Physical	77%	82%	72%
Language	73%	86%	69%
Cognitive	71%	82%	65%
Literacy	75%	89%	69%
Mathematics	53%	74%	48%
Ready in 6/6 Domains	35%	55%	31%

Table A2. Size and demographics of the ECEAP cohort compared to the non-ECEAP lower and higher-income cohorts

	ECEAP Cohort (5,252)	Higher income (20,278)	No ECEAP Lower income (24,427)
<b>Gender</b>			
Male	50%	51%	52%
Female	50%	49%	48%
<b>Race/Ethnicity</b>			
Hispanic (any race)	46%	14%	39%
White	33%	67%	38%
Black/African American	7%	2%	6%
Two or more races	7%	9%	9%
Asian	3%	6%	4%
American Indian/Alaska Native	1%	1%	2%
Native Hawaiian/Other PI	1%	1%	2%
<b>DLL (any background)</b>	39%	10%	33%
<b>Hispanic/Transitional Bilingual</b>	32%	4%	24%

Table A3. Breakdown of dual language learners by race/ethnicity, compared with non-ECEAP lower and higher-income dual language learners.

	ECEAP DLL cohort (2,058)	No ECEAP	
		Higher income DLL (1,942)	Lower income DLL (8,161)
Hispanic (any race)	81%	44%	73%
White	6%	18%	10%
Black/African American	5%	4%	5%
Two or more races	1%	4%	1%
Asian	7%	29%	8%
American Indian/Alaska Native	< 1%	1%	1%
Native Hawaiian/Other PI	1%	1%	2%

Table A4. The proportion of the cohort who were lower income (including ECEAP) for the entire kindergarten cohort, and separately for Hispanics, DLLs, and Hispanic DLLs.

	Total Students	Percent lower income (including ECEAP)
Statewide	49,957	59%
Hispanic, Any	14,917	81%
DLL, Any	12,161	84%
Hispanic DLL	8,430	90%

Table A5. The relationship between race/ethnicity and kindergarten readiness for lower-income and ECEAP cohorts combined.

	Total	Social emotional*	Physical**	Language**	Cognitive**	Literacy**	Math**	Ready in 6/6 domains**
TOTAL	29,679	68%	73%	70%	66%	70%	49%	32%
American Indian/Alaskan Native	486	66%	70%	67%	62%	70%	47%	29%
Asian	1,197	72%	78%	68%	71%	77%	59%	40%
Black/African American	1,957	65%	71%	75%	66%	78%	56%	37%
Hispanic-Any Race	12,044	68%	72%	62%	63%	60%	39%	25%
White	10,985	67%	73%	77%	69%	77%	56%	36%
Native Hawaiian/Other PI	489	70%	73%	66%	65%	66%	42%	30%
Two or more races	2,520	68%	75%	77%	70%	79%	56%	39%

\* Chi-Square SIG. P<.01

\*\* Chi-square sig p<.001

Table A6: The proportion increase in kindergarten readiness among the ECEAP cohort compared to their lower-income counterparts for White, Hispanic, and “Other.”

	Hispanic			White			Other <sup>1</sup>		
	ECEAP	Lower income	Difference <sup>2</sup>	ECEAP	Lower income	Difference <sup>2</sup>	ECEAP	Lower income	Difference <sup>2</sup>
Social Emotional	73%	67%	8%**	68%	67%	1%	73%	67%	10%**
Physical	77%	71%	8%**	77%	72%	6%**	76%	73%	4%
Language	67%	61%	10%**	79%	76%	4%	78%	69%	12%**
Cognitive	68%	61%	11%**	73%	69%	7%**	70%	67%	5%
Literacy	66%	59%	12%**	82%	76%	8%**	82%	74%	11%**
Mathematics	45%	37%	20%**	60%	55%	8%**	59%	53%	11%*
6 of 6 areas	30%	24%	25%**	39%	36%	8%	41%	35%	15%*

\* Difference between ECEAP and lower-income X<sup>2</sup> sig p<.01

\*\* Difference between ECEAP and lower-income sig. p<.001

1. Includes Asian, black/African American, Native Hawaiian/Other Pacific Islander, Native American/Alaska Native (excludes the 2 or more races category).

2. Calculated as (ECEAP proportion-lower-income proportion)/Lower-income proportion.

Table A7. The proportion of Hispanic dual language learners who were kindergarten ready by domain compared to Hispanic English speakers, for ECEAP and lower-income cohorts combined.

	Social emotional	Physical	Language	Cognitive	Literacy	Math	Ready in 6/6 domains
Hispanic DLL	68%	72%	54%	60%	52%	33%	20%
Hispanic native English	69%	72%	75%	68%	73%	49%	33%

Table A8. Relationship between ECEAP and kindergarten readiness among Hispanic DLL compared to non-DLL Hispanic students only.

	Hispanic DLL			Hispanic native English		
	ECEAP	Lower income	Difference <sup>1</sup>	ECEAP	Lower income	Difference <sup>1</sup>
Social Emotional	73%	66%	11%**	72%	69%	4%
Physical	77%	71%	9%**	76%	71%	6%
Language	61%	52%	17%**	79%	74%	6%*
Cognitive	67%	58%	16%**	71%	67%	6%
Literacy	59%	50%	17%**	80%	71%	12%**
Mathematics	40%	31%	28%**	56%	48%	16%**
6 of 6	26%	19%	35%**	40%	32%	24%**

\* Difference between ECEAP and lower-income X<sup>2</sup> sig p<.01

\*\* Difference between ECEAP and lower-income sig. p<.001

1. Calculated as (ECEAP proportion-lower-income proportion)/Lower-income proportion.

Table A9. Proportion of lower-income students who were Hispanic dual language learners, and the proportion of Hispanic DLLs who were enrolled in ECEAP and kindergarten ready in Six of Six domains, statewide and by county

	Hispanic dual language learners only			
	Total lower income or ECEAP	Proportion who were Hispanic DLL	Proportion enrolled in ECEAP in 2014-15	Proportion kindergarten ready in 6/6 domains
Statewide	29,679	26%	22%	20%
Adams	343	68%	12%	7%
Asotin	140	3%	25%	0%
Benton	1,240	28%	27%	10%
Chelan	467	60%	19%	7%
Clallam	185	11%	70%	20%
Clark	1,891	22%	22%	16%
Columbia	17	0%	0%	0%
Cowlitz	683	14%	26%	16%
Douglas	305	62%	23%	30%
Ferry	20	0%	0%	0%
Franklin	1,008	63%	17%	7%
Grant	914	57%	29%	19%
Grays Harbor	477	18%	56%	39%
Island	237	3%	50%	38%
King	5,296	27%	21%	26%
Kitsap	822	5%	13%	16%

	Hispanic dual language learners only			
	Total lower income or ECEAP	Proportion who were Hispanic DLL	Proportion enrolled in ECEAP in 2014-15	Proportion kindergarten ready in 6/6 domains
Kittitas	151	23%	12%	12%
Klickitat	89	20%	17%	11%
Lewis	496	15%	21%	19%
Lincoln	42	0%	0%	0%
Mason	173	13%	5%	27%
Okanogan	259	34%	33%	36%
Pacific	137	14%	89%	11%
Pend Oreille	68	0%	0%	0%
Pierce	4,471	12%	34%	24%
San Juan	22	55%	75%	50%
Skagit	620	43%	15%	11%
Snohomish	1,948	20%	33%	27%
Spokane	2,222	2%	27%	12%
Stevens	190	1%	0%	0%
Thurston	978	11%	18%	22%
Wakiakum	20	0%	0%	0%
Walla Walla	337	37%	30%	34%
Whatcom	511	17%	10%	28%
Whitman	51	0%	0%	0%
Yakima	2,849	52%	14%	24%



## Appendix B. Technical Notes

### Early Childhood Education and Assistance Program (ECEAP)

Washington’s state-funded preschool program, ECEAP, was established in 1985 to provide education to eligible preschool children, combined with health, nutrition, and family support (DEL, 2016). Participation is limited to those who meet one of the following criteria: Family income at or less than 110% of the federal poverty level; eligible for special education services; or the family has one of several other defined risk factors. To be eligible for participation, children must be older than 3 and younger than 5 years on August 31 of their academic enrollment year.

Statewide, 336 different ECEAP sites consisting of 732 separate ECEAP classrooms were identified as providing ECEAP services in 2014-15.<sup>8</sup> Most ECEAP classrooms are located in public schools, followed by child care or Head Start facilities, non-profits and faith-based organizations (DEL 2016a). ECEAP services are currently available in 36 of the 39 counties in Washington.

As of the study date, all ECEAP classrooms operated on one of three funding models, including part-day programs funded only with ECEAP dollars, and full- and extended-day models supplemented by subsidized child care funds. In 2014-15, the majority (81 percent) of ECEAP classrooms provided part-day services, with 12 and 6 percent providing full or extended-day services, respectively. There was variability across the state in the availability of full- or extended-day versus part-time services. In King county, a large urban area including the city of Seattle, 65 percent of ECEAP classrooms operated on the part-day model, compared to 81 percent statewide and over 90 percent in the central, rural regions of the state.

Most ECEAP classrooms were taught using English Only (76 percent) or bilingual English/Spanish (21 percent). Few classrooms were Spanish only (2 percent) or utilized English and another language (1 percent). There was variation across the state. For example, in the North Central region, 88 percent of classrooms were either bilingual Spanish/English or Spanish only. The vast majority of the classrooms that used a language other than English or Spanish were located in King county, home to substantial populations of non-Hispanic immigrant groups.

8. This number may not exactly match those reported elsewhere due to changing site names during the year, as well as at least one case of one site “splitting” into two sites mid-year. Please refer to the technical notes for more details.

## Washington Kindergarten Inventory of Developing Skills (WaKIDS)

Washington uses the WaKIDS assessment to guide the transition to kindergarten by encouraging collaborative practices within and across educational sectors, including the family. The WaKIDS assessment helps teachers to better understand and address each child's individual learning needs.<sup>9</sup> The GOLD® assessment portion of WaKIDS includes six domains of readiness: social emotional, physical, cognitive, language, literacy, and math (Gingerich, 2014). Use of WaKIDS is required for all students in a state-funded full-day kindergarten classroom and seventy-one percent of all kindergartners in the state were assessed with the WaKIDS in the fall of 2015.

### Data Sources

- State-funded preschool school participation (ECEAP): Early Learning Management Systems (ELMS), Department of Early Learning (2014-15)
- Kindergarten enrollment and program participation: Comprehensive Education Data and Research System (CEDARS), Office of Superintendent of Public Instruction (2015-16)
- Kindergarten Readiness: Washington Kindergarten Inventory of Developing Skills (WaKIDS), Office of Superintendent of Public Instruction (2015-16)

### Data Linkage.

ERDC maintains a statewide longitudinal database which is updated annually. For more information on procedures for linking individual data, please refer to the ERDC website.<sup>10</sup>

### Study population

ECEAP Cohort: 5,252 Consisted of all ECEAP students from 2014-15 who:

1. Were enrolled in ECEAP at least six months at one site;
2. Enrolled in kindergarten in the 2015-16 school year; and
3. Had WaKIDS assessment data.

9. For more information on WaKIDS, visit <http://www.k12.wa.us/wakids>

10. <http://www.erd.wa.gov>

Table B1: ECEAP cohort breakdown

Total ECEAP Participation 2014/2015	11,409	100%
<i>Age 4 or older on August 31, 2014</i>	8,068	71%
Enrolled in kindergarten Fall, 2015	7,158	63%
Assessed on WaKIDS	6,308	55%
6+ months at ECEAP site	5,252	46%

Statewide non-ECEAP comparison cohorts. Consisted of all incoming kindergartners in the Fall of 2015 who:

1. Had WaKIDS assessment data;
2. Attended an elementary school in which at least one former ECEAP student was enrolled, and
3. Did not attend ECEAP at all the previous year (2014-15). The statewide non-ECEAP comparison group was further divided as follows:
  - a. Lower-income comparison group: 24,427 kindergartners who were eligible for Free or Reduced Price Lunch (FRPL) in 2015-16.
  - b. Higher-income comparison group: 20,278 kindergartners who were not eligible for FRPL in 2015-16.

Table B2: non-ECEAP kindergarten cohort breakdown

Total Kindergarten enrollment Fall 2014/2015	74,535	100%
Assessed on WaKIDS Fall 2015	51,956	70%
Attended a school with ECEAP cohort member	44,705	60%
<i>Lower income (FRPL eligible)</i>	24,427	55%
<i>Higher income (not FRPL eligible)</i>	20,278	45%



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