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## **Cuyahoga County's Universal Pre-Kindergarten Pilot: Findings from the First Five Years**

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### **Key Findings**

- Over five years, the UPK pilot served nearly 5,000 children ages 3-5 through its participating sites, with positive developmental gains for children while in UPK, including children with developmental delays.
- Children enrolled in the UPK pilot showed statistically significant gains in school readiness over the course of the year in the setting. Statistically significant gains were found on all five subscales of the Bracken School Readiness Assessment - colors, letters, numbers/counting, size/comparison, and shapes.
- Fully one-half of UPK children also show meaningful positive change on three of the five Bracken subscales, surprising given a relatively short observation period of 4-7 months. Meaningful change is defined as 3 or more point change on the subscale score.
- Children with the lowest performance on the fall Bracken assessment show the greatest gains over the course of the school year. Children in the Delayed and Very Delayed categories show an average of 55% improvement, while Average and Advanced children show 19% improvement.
- Children's school readiness as measured by the Bracken during preschool shows strong predictive ability of performance on the KRA-L at entry to kindergarten. The measure is particularly good at assessing children in the very delayed, delayed and advanced category, while less so for children in the average range.
- The amount of UPK experience is positively associated with kindergarten readiness. Among children who participate in UPK consistently the mean KRA-L score is 18.2. Also, the mean KRA-L score for children with two years of UPK experience (18.7) is significantly higher than those with only a single year in a UPK setting (16.0)
- UPK children who subsequently entered Cleveland Metropolitan School District kindergarten show an average level of school readiness significantly higher than the average for all children entering CMSD (17.4 vs 15.7). Though lower than county and state averages, they indicate superior readiness among UPK-prepared children.

## **Introduction**

In Cuyahoga County, Ohio, a universal pre-kindergarten (UPK) pilot program was launched in fall 2007, through the County's Office of Early Childhood/Invest in Children. The goals of Invest in Children (IIC) are to promote and enhance the physical, social, and emotional well-being of Cuyahoga County's children prenatal to age six through a variety of strategies. The UPK pilot provided funding for 1,000 slots per year in child care programs that were selected through a competitive bid process. Approximately 24 child care sites involving 60 classrooms participated in the pilot each year. Each selected program made a commitment to the quality standards of the pilot and received special funding to invest in program quality, through such aspects as teacher salaries, professional development, curriculum enhancements, and program materials. During its first five years of operation, the UPK pilot served 4,884 children ages 3-5 through its participating programs.

This summary reviews data the UPK pilot collected as part of the evaluation of the UPK pilot program over the first five years. Two analyses are presented: (1) analysis of data on child development during UPK; and (2) analysis of data on UPK children who entered kindergarten in CMSD and for which a school readiness score was available.

## **How have UPK children fared while in prekindergarten?**

A key focus of the UPK pilot is on enhancing child development during the prekindergarten years. This has been assessed in two ways over the five years of the pilot.

To assess child development during the initial year of the pilot (2007-08), a sample of participants was drawn consisting of a stratified random sample of 208 children representing all 24 UPK sites participating. Achievement was measured using the Peabody Picture Vocabulary Test (PPVT-III), as well as 2 subtests of the Woodcock Johnson III: Letter/Word Recognition (WJ-LW) and Applied Problems (WJ-AP). The PPVT-III measures receptive language skills; the WJ-LW measures the child's ability to recognize words and letters; and the WJ-AP measures children's beginning math skills. Children were assessed at 3 different time points: spring 2008, fall 2008, and spring 2009. Analysis of these data supported four conclusions: First, the results showed that achievement may improve for children enrolled in UPK who were most at-risk at baseline (started below the 50<sup>th</sup> percentile). Second, achievement remained relatively flat for children who were between the 51<sup>st</sup> and 75<sup>th</sup> percentile at baseline. Third, while scores decreased for those above the 76<sup>th</sup> percentile, the decrease was only significant on the PPVT. This result suggested a need to examine the needs of high-performing students. Fourth, the magnitude of the gains for the most at-risk children exceed the gains to be expected from simply having a preschool experience, and are comparable to the gains found in larger-scale UPK initiatives.

After the pilot year, the value of the child development data for early care teachers working with children was clear. Based on a review of assessments, the Bracken School Readiness Assessment (BSRA-3) was selected as the measure to be used across sites. The Bracken includes five subtests to assess basic concepts related to school readiness: colors, letters, numbers/counting, size/comparison, and shapes. The Bracken is administered by independent consultants in the fall and spring of the year prior to kindergarten through direct interaction with each child. The assessment provides immediate feedback for early care teachers as to what areas a child is excelling in and where they need additional growth. The Bracken was administered in UPK sites beginning in fall 2010.

Bracken School Readiness data were available for 1,031 UPK children who participated in UPK during the 2010-11 and 2011-12 years. These include only children for which both a fall and spring assessment are available. See Table 1. On average, children showed statistically significant gains on the Bracken scale over the course of the previous school year. Significant gains were shown on all five subscales. Average gains on the Numbers and Letters subscales were approximately one and one-half times as large as those seen on the Sizes and Shapes subscale. Average gains on the Colors subscale were somewhat smaller in part because at baseline many children were already performing very well on this scale, so fewer gains could be observed.

Table 2 examines these same data by whether a child showed a meaningful change on the subscales, defined as a change of 3 points on the scale.<sup>1</sup> These results parallel the analysis of means and show approximately one-half of children demonstrating meaningful change on the Numbers, Sizes, and Shapes subscales, 40% on the Letters subscale, and 9% on the Colors subscale.

**TABLE 1: Bracken School Readiness Assessment, 2010-11 and 2011-12 (n=1,030)**

		Fall Assessment	Spring Assessment	
Subscale	Number of Items	Mean % Correct	Mean % Correct	Raw Gain*
Colors	10	90.1	95.8	+5.7%
Letters	15	55.8	73.2	+17.4%
Numbers	18	50.7	70.1	+19.4%
Sizes	22	48.9	61.7	+12.8%
Shapes	20	58.1	69.7	+11.6%

Note: Subscale scores were computed by dividing the number of correct answers by the number of items in the subscale. \* Average gains by subscale are each statistically significant at  $p < .01$ .

<sup>1</sup> The three-point rule-of-thumb for meaningful change is used by the developers of the BSRA.

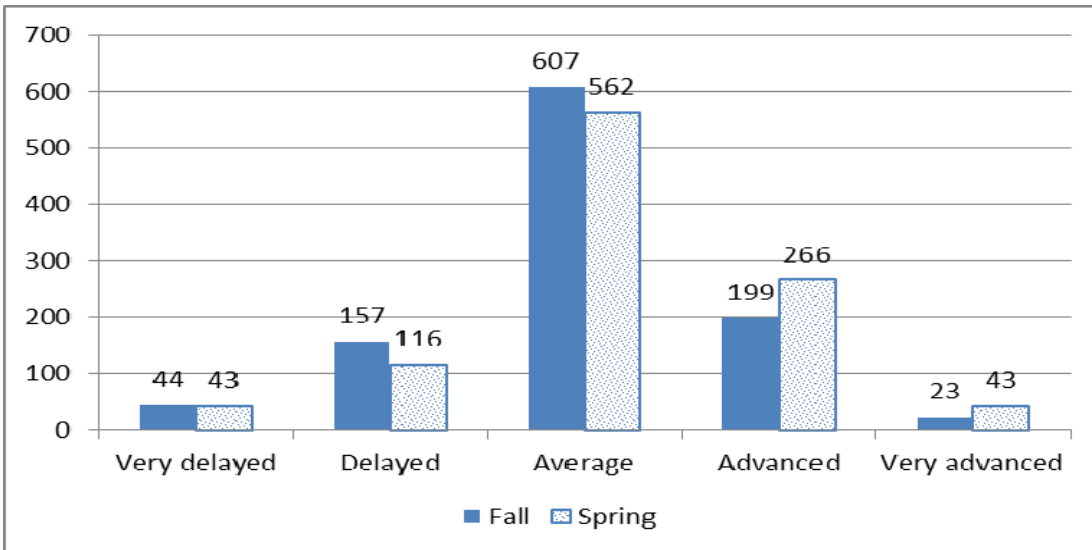
**TABLE 2: Bracken School Readiness Assessment, 2010-11&2011-12 (n=1,030) by Number of Children Showing Meaningful Change Fall to Spring**

	<b>Decrease 3 or more points</b>	<b>No Change +/- 2 points</b>	<b>Increase 3 or more points</b>
<b>Colors</b>	8	933	90
<b>Letters</b>	27	599	405
<b>Numbers</b>	21	500	510
<b>Sizes</b>	92	402	536
<b>Shapes</b>	67	496	468

The analysis of BSRA scores using the lens of ‘meaningful change’ shows that though a majority of children demonstrated no change across the subscales, a distinct subgroup shows an increase in assessment scores. Forty to fifty percent showed meaningful change on four of the five subscales. A small minority of children also show a decline in their performance on the assessment.

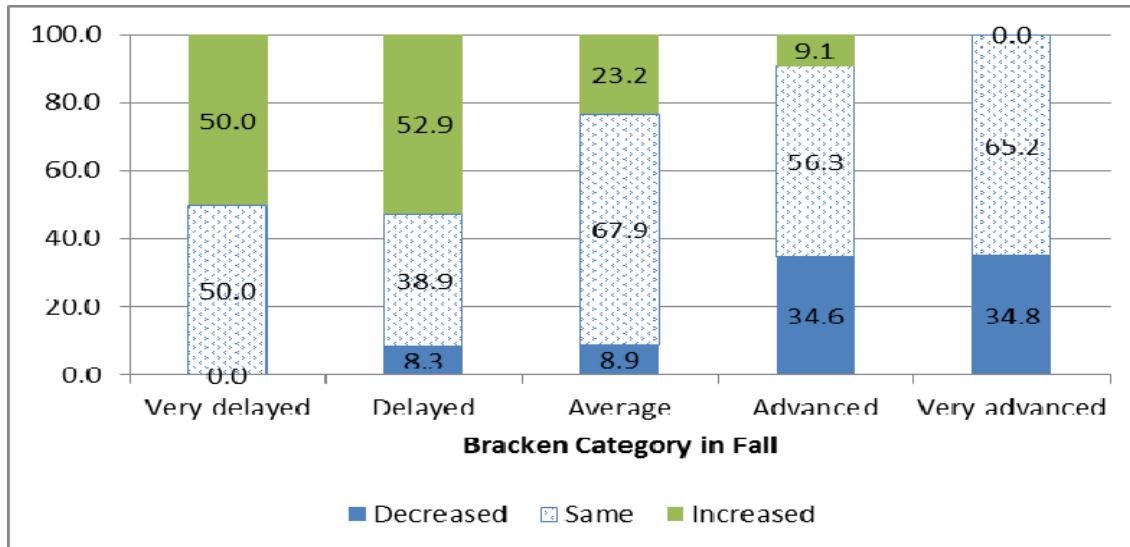
The amount of time elapsed between the two administrations of the BSRA was significantly correlated with the amount of change shown on the scale. The time between BSRAs varied from 4 to 7 months based on when the independent consultants were scheduled to administer the BSRA at each UPK site. The number of days elapsed between assessments was significantly correlated with both the spring BSRA score and the amount of change shown between fall and spring. Children whose assessments were separated by 7.5 months showed an average gain of 3 more points on the BRSA, compared to those whose assessments were separated by 4-6 months.

In addition to examining subscale scores (% correct and meaningful change), each student was also categorized by overall performance on the Bracken in relation to their age cohort. These categorical ratings take into account that older children should know more than younger children and are expected to be able to get more items correct. These ratings include Very advanced, Advanced, Average, Delayed, and Very delayed. Figure 1 shows that over the two program years the distribution shifted upward across the categories.



**FIGURE 1: UPK Students by Categoric Rating on BSRA, 2010-11 & 2011-12 (n=1,030)**

Using the Bracken categorical ratings, we can examine whether and how students changed over the course of the school year. See Figure 2. The categorical ratings are based on nationally normed Bracken data and are age-adjusted for each child. Overall, 60% of students remained in the same category between fall and spring, 26% moved up, and 14% moved down.



**FIGURE 2: UPK Children by Change in Categoric Rating on BRSA<sup>2</sup>**

By examining the changes by group (Figure 2), we see that the majority of children (50%+) who were in the delayed categories in the fall had improved by the spring. Conversely, the majority of the children who were in the advanced categories in the fall remained in those

<sup>2</sup> Note there is a ceiling and floor effect on the Bracken scale in that children scoring in highest and lowest categories can only remain in the same category or move in a single direction at the next testing.

categories in the spring, while one-third moved down. Among children in the Average category, the majority remained there, but by a margin of nearly two to one, they moved up to advanced categories (23%) versus moving down to delayed categories (9%).

Shown in a somewhat different way, Table 3 presents the average gains on the BSRA by children’s categoric rating in the fall.

**TABLE 3: Bracken School Readiness Assessment by Number of Children by Fall Category and change in scores, 2010-11&2011-12 (n=1,030)**

Fall BSRA Category	Number of children	Mean Fall % Correct	Mean Spring % Correct	Raw Gain from Fall	% Gain from Fall
Very Delayed	44	25.6	44.0	18.4	72%
Delayed	157	39.1	59.2	20.1	51%
Average	607	62.0	75.4	13.4	22%
Advanced	199	78.9	86.5	7.6	10%
Very Advanced	23	83.6	90.1	6.5	8%

These data show that the most delayed children show the largest gains by the spring term in regard to raw gain and percentage gain on the BSRA. However, despite substantial gains, many of these children continue to show delayed performance on the spring BSRA.

**Does performance during pre-kindergarten predict kindergarten readiness?**

The Bracken Assessment is designed to measure a child’s readiness for school. To examine its predictive ability in relation to children’s kindergarten readiness at the start of kindergarten data from the child’s spring BSRA were compared to performance on the Kindergarten Readiness Assessment-Literacy (KRA-L) that fall. See Table 4.

**TABLE 4: UPK Children by BSRA Category and KRA-L Performance (n=121)**

Spring BSRA Category	Number of children	Mean KRA-L Score	% KRA-L Band 1	% KRA-L Band 2	% KRA-L Band 3
Very Delayed	15	11.2	80.0	20.0	0
Delayed	21	14.0	47.6	47.6	4.8
Average	63	20.0	22.2	41.3	36.5
Advanced	22	24.0	4.6	22.7	72.7
Very Advanced	0	-	-	-	-

Among children who scored in the very delayed category on the BSRA, 80% scored in Band 1 of the KRA-L in the fall. Among those scoring in the delayed category, 95% scored in Bands 1 and 2 of the KRA-L. Among children rated as average on the BSRA 78% scored in Bands 2 and 3 of the KRA-L. Lastly, among children rated as advanced on the BSRA, 73% placed in Band 3 of the KRA-L. No children with KRA-L data available had scored in the very advanced category of the BSRA. These data show that the BSRA demonstrates good predictive ability for children's KRA-L performance, especially for children at the extremes. For children in the delayed and average categories on the BSRA, there is more variation in their performance on the KRA-L. Noteworthy is that 22% of average children on the BSRA scored in the lowest band of the KRA-L, suggesting either challenges in assessing this group's performance or the possibility of some learning loss during the months between preschool and kindergarten.

### **How do UPK children fare when they arrive at kindergarten?**

A second analysis examined the performance of children on Ohio's mandatory kindergarten entry assessment measure, the Kindergarten Readiness Assessment-Literacy (KRA-L). The KRA-L was first implemented in public school districts beginning in 2007. The assessment is administered to students entering kindergarten during the first four weeks of the fall term. It has a value of 0-29 and has three score bands: Band 1 0-13 (Assess broadly for intense instruction), Band 2 14-23 (Assess for targeted instruction), and Band 3 24-29 (Assess for enriched instruction). Children scoring Band 1 may be at serious risk of being unprepared for kindergarten.

KRA-L data on children in Cuyahoga County entering the Cleveland Metropolitan School District (CMSD) in fall of five school years (2008-2012) were obtained and matched to children who were in care in UPK and other settings during the previous year.<sup>3</sup> Data on children entering other public school systems, charter schools, or private and parochial schools were not available for this analysis. Figure 3 summarizes the mean KRA-L scores for several subgroups of children. The mean scores for all children in Cuyahoga County and state-wide in Ohio came from reports produced by the Ohio Department of Education.

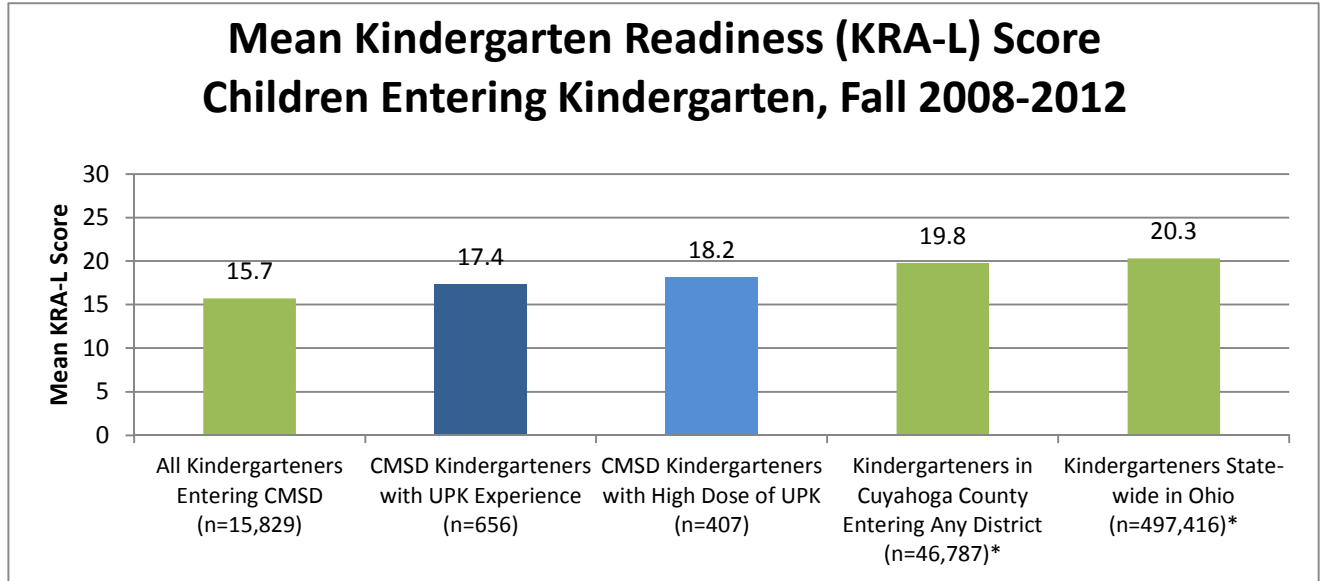
These data show that, on average, children served in UPK settings fare better on the school readiness measure compared to all children entering CMSD (14% better), and children

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<sup>3</sup> Among the sample of UPK children, 963 records had suppressed names, 279 records had no UPK attendance data, 2,071 children lived outside Cleveland, and 920 children had no KRA-L score in CMSD data.

with consistent participation in UPK score even higher.<sup>4</sup> However, UPK children do not fare as well compared to the average for all children in Cuyahoga County or state-wide in Ohio.

**Figure 3 Kindergarten Readiness Data – Mean Scores**



\*Mean scores for Cuyahoga County and Ohio are based on data from 2008-2011.

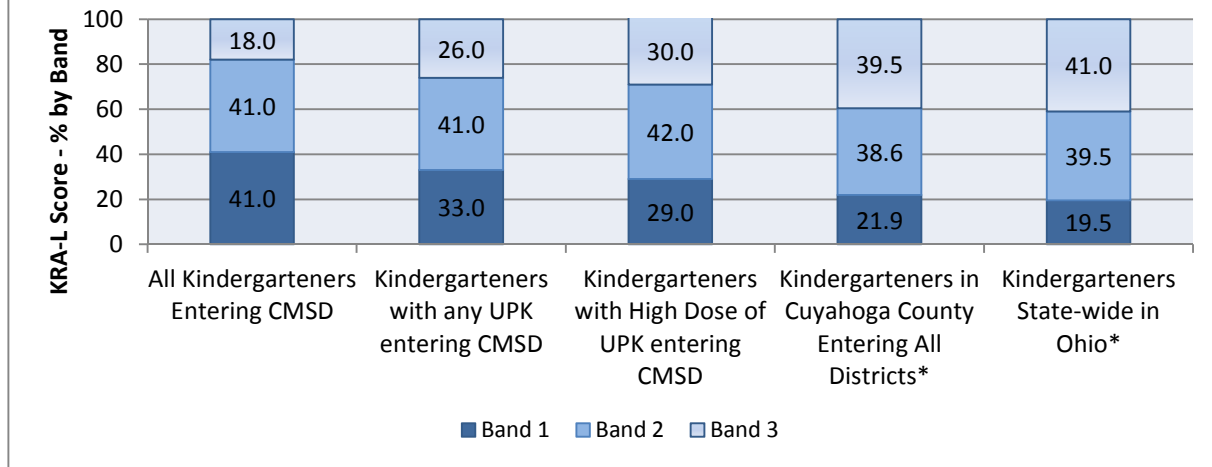
Figure 4 shows the proportions of children scoring in each of the three bands in each of these groups. These data also show that a larger percentage of children entering CMSD with consistent participation in UPK are prepared for a kindergarten experience compared to the general CMSD population (72% versus 59% in Bands 2 & 3).

**Figure 4 School Readiness Data – Scores by Bands**

<sup>4</sup> Consistent participation (“high dose”) is defined as a child being enrolled in UPK for 9 months or more and having at least 16 days of enrollment per month (average or 4 days per week). Fully 75% of UPK children receive a “high dose” of UPK experience.



## Kindergarten Readiness (KRA-L) Score by Bands Children Entering Kindergarten, Fall 2008-2012



\*Percent by bands for Cuyahoga County and Ohio are based on data from 2008-2011.

### Limitations

The longitudinal analysis of the experience of young children is challenged by several data issues, that could impact the analysis presented here. First, children with developmental delays are included in this analysis because no systematic data were available to identify them. Inclusion of these children likely reduces the magnitude of the effects observed. Second, kindergarten readiness scores are available only for a subset of children. Overall, only 13% of the children served by the UPK pilot were able to be matched to a KRA-L score from the Cleveland Metropolitan School District over these five years. A major factor is that 42% of the UPK children (2,071) lived outside the Cleveland school district so their KRA-L score would have been collected by other municipal school districts. Among UPK children with Cleveland addresses, 23% were matched to a KRA-L score from CMSD. Presently, data from other districts are not available for analysis. In addition, children who enrolled in kindergarten in charter schools and parochial schools also are absent from this analysis. Third, other concerns relate to data access issues, incompleteness of data (e.g., address information), as well as parental nonconsent for data sharing. These factors could impact the comparisons made here in a number of ways, but at present, no conclusive evidence is available to make a determination on this impact.