



EVALUATION REPORT

BUREAU OF PROGRAM EVALUATION

Volume 5, Issue 2, May 2011

Longitudinal Data Study of AVANCE Students' Academic Achievement in HISD: Year 1 Tracking of 2010–2011 Kindergarteners

By Danya Corkin

The AVANCE Head Start program provides comprehensive early childhood education and family support services to low-income families with children 3 to 5 years of age. The main purpose of Head Start is to improve school readiness of economically-disadvantaged children by providing services that will improve their cognitive, social, and academic outcomes. Therefore, the aim of the current evaluation was to examine the academic achievement of AVANCE Houston Inc. students, including those dually enrolled in the Houston Independent School District (HISD), following enrollment in an HISD kindergarten program. The study provides a comparison of the 2010–2011 Stanford 10 and Aprenda 3 test scores of 195 kindergarten students who attended AVANCE Houston Inc. in 2009–2010 to the scores of their economically-disadvantaged counterparts in Title I schools who did or did not attend an HISD prekindergarten program. In addition, to determine the percent of AVANCE students entering the district as developed in their phonemic awareness, a predictor of success in learning to read (University of Texas System/Texas Education Agency, 2010), the results of the Texas Primary Reading Inventory (TPRI) and Tejas LEE were assessed.

Background

AVANCE (A-vahn-ceh), meaning, “advance” or “progress” in Spanish, has been serving the needs of at-risk families, primarily Hispanic parents and children, since 1973. AVANCE’s mission is to assist parents and children of impoverished communities by improving their parenting skills, increasing literacy, and enhancing school-readiness. To tackle their mission, AVANCE provides disadvantaged families with a multitude of services, including parent-child education programs, early childhood development classes, adult and computer literacy, General Education Diploma (GED), and English as a Second Language (ESL) classes, fatherhood instruction, home visitations, counseling referrals, medical/psychological referrals, and Head Start programs.

The extent that Head Start services improve the school readiness of low-income children remains an area of on-going debate (Nisbitt, 2009) due to mixed research findings (see Currie, 2001). Researchers have proposed that findings of the effects of a Head Start intervention have varied because of the selection of biased comparison groups. For example, some studies have simply compared Head Start students to other students who had not attended a Head Start program despite the fact that the latter group could have

received other forms of early childhood education interventions (Zhai, Brooks-Gunn, & Waldfogel, 2011). The current evaluation has attempted to address the selection bias issue by identifying whether a student received another type of early childhood education intervention and by comparing Head Start students to students with similar economic backgrounds attending the same schools.

Data and Methods

Data Collection

Data compiled for this report included student enrollment and performance of HISD kindergarten students. Student enrollment and individual identification numbers were extracted from the Texas Education Agency’s (TEA) Public Education Information Management System (PEIMS). Student performance data were collected from the following test assessments: the Stanford Achievement Test (Stanford 10), the Aprenda: La Prueba de Logros en Espanol (Aprenda 3), the Texas Primary Reading Inventory (TPRI), and the El Inventario de Lectura en Español de Tejas (Tejas LEE).

Instruments

Stanford Achievement Test (Stanford 10). The Stanford

10 assesses students' academic achievement in various academic subjects across 12 grade levels (kindergarten through grade 11). The normal curve equivalent (NCE; a normalized standard score) for the reading and mathematics subtests are reported in the current evaluation to assess student achievement.

La prueba de logros en español, Tercera edición (Aprenda 3). The Aprenda 3 is a norm-referenced, standardized achievement test in Spanish, and is used to assess the level of content mastery for students who receive instruction in Spanish. The Aprenda assesses students' academic achievement in the same content areas as the Stanford; however, the Aprenda is not a translation of the Stanford. The current evaluation also used the Aprenda NCE scores from the reading and mathematics subtests to assess student achievement.

Texas Primary Reading Inventory (TPRI, 2010). The Texas Primary Reading Inventory (TPRI) is a teacher-administered assessment of reading skills for children. The primary purposes of the TPRI are to facilitate a teacher's capacity to identify children at-risk for reading difficulties, including dyslexia, and to determine the appropriate instructional objectives and interventions for these students. Kindergarten students first take the TPRI screening test, which assesses their letter knowledge and phonemic awareness to determine whether they are developed (D) or are still developing (SD). Students who score developed on the screening section are not likely to be at risk of developing reading difficulties. For students who score still developing on the screening section, additional portions of the inventory are administered. The current evaluation gathered students' results on the Screening Assessment, Phonological Awareness Inventory 1 (*Rhyming*) and Graphophonemic Knowledge Inventory 6 (*Letter Name Identification*).

El Inventario de Lectura en Español de Tejas (Tejas LEE). The Tejas LEE measures reading skills important to the development of Spanish reading and comprehension in kindergarten through 3rd grade. Similar to the TPRI, it can be used to determine appropriate instructional interventions. The levels of performance include Desarrollado/Developed, Nivel Esperado/Expected performance, and Nivel de Intervención/Needs Intervention. The current evaluation included the levels of performance on Inventory 1 (*Identificación de las letras/Letter Naming*) assessing graphophonemic knowledge and Inventory 6 (*Identificación del sonido inicial/Identify Initial Sound*) assessing phonological awareness. These two inventories were selected because they are comparable to the two TPRI inventories previously discussed.

Study Sample

To determine the students to include in this evaluation, AVANCE Houston Inc. provided HISD with a list of students enrolled in their program in 2009. Of the 789 students on the list, 397 were identified as enrolled in HISD based on the district's PEIMS 2010–2011 database. Of those 397 students, 202 were classified as being in prekindergarten, while 195 were classified as being in kindergarten. Because students in the district are not tested by uniform assessments until they reach kindergarten, the current evaluation examined the performance of the 195 kindergartners who were previously enrolled in the AVANCE Houston Inc. program. Of the 195 AVANCE students, approximately 55 percent had been dually enrolled in HISD, while the other 45 percent had been enrolled in an AVANCE stand-alone program. Upon identifying the 195 AVANCE kindergartners, data of all of the kindergartners who did not attend AVANCE but who did attend the same Title I elementary schools were used as student comparison groups for this evaluation.

Table 1 provides demographic information, according to the 2010–2011 PEIMS data, of the 2009 AVANCE Head Start students in HISD kindergarten in 2010–2011 compared to all other kindergartners in HISD. In addition, AVANCE students' performance was compared to kindergartners who attended the same Title I schools as the 2009 AVANCE Head Start students. All further analyses conducted used this smaller subset of kindergartners who attended the same Title I schools as the 2009 AVANCE Head Start students (See **Appendix A** for the list of Title I schools). The students in the AVANCE Head Start program were more likely to be Hispanic, limited English proficient, bilingual, economically disadvantaged, and at-risk compared to HISD students that had not been enrolled in the program the previous year.

How did AVANCE students' Stanford 10 and Aprenda 3 reading and math scores compare to the scores of their Title I school peers?

To determine how the 2009 AVANCE students compare to other kindergartners in the district attending the same Title I schools in terms of reading and math achievement levels, several comparison groups were created for the current analyses. Because the vast majority of AVANCE students were economically disadvantaged (98.5 percent), to address potential selection bias, three comparison groups were chosen based on students' economic status. The economically-disadvantaged comparison groups were further bifurcated by whether or not these students

Table 1: 2010–2011 Demographics of HISD Kindergarteners by AVANCE and Non-AVANCE Student Groups

	AVANCE [†] (N = 195)		Non-AVANCE Overall HISD (N = 16,449)		Non-AVANCE Comparable Title I Schools (N = 3,038)	
	N	%	N	%	N	%
Gender						
Female	103	52.8	8,054	49.0	1,491	49.1
Male	92	47.2	8,395	51.0	1,547	50.9
Race/Ethnicity						
African American	23	11.8	3,849	23.4	489	16.1
Hispanic	169	86.7	10,545	64.1	2,386	78.5
White	1	0.5	1,318	8.0	129	4.2
Asian	0	0	538	3.3	11	0.4
American Indian	1	0.5	25	0.2	4	0.1
Pacific Islander	0	0.0	17	0.1	0	0.0
More than 2 Races	1	0.5	157	1.0	19	0.6
Limited English Proficient (LEP)	134	68.7	7,503	45.6	1,415	46.6
Economically-disadvantaged	192	98.5	13,599	82.7	2,734	90.0
At-Risk	166	85.1	11,530	70.1	2,209	72.7
Immigrant	1	0.5	591	3.6	59	1.9
English as a Second Language (ESL)	0	0	432	2.6	4	0.1
Bilingual	109	55.9	6,484	39.4	1,337	43.9
Migrant	1	0.5	48	0.3	21	0.7
Title I	195	100.0	15,387	93.5	3,033	99.8
Special Education	8	4.1	623	3.8	108	3.6

Note: All data retrieved from PEIMS 2010–2011. [†]AVANCE students in the current analysis include students dually enrolled in HISD.

had attended an HISD prekindergarten program. The first comparison group consisted of economically-disadvantaged students who were identified as not having attended prekindergarten in HISD the previous year. The second comparison group was economically-disadvantaged students who had attended HISD prekindergarten the previous year. Finally, the third group consisted of non-economically-disadvantaged students who had attended the same Title I schools as AVANCE students.

One-way analyses of variance (ANOVAs) were conducted to test the effects of the four kindergarten subgroups identified based on the Stanford reading, Stanford math, Aprenda reading, and Aprenda math NCE scores. A univariate general linear model was used for the analysis and Type III sums of squares (tests of independent effects of variables) were used for significance testing. Results of the ANOVAs, presented in **Tables 2** and **3**, showed a statistically significant difference between kindergarten groups in Stanford reading $F(3,1750) = 33.14, p < .001$, Stanford math $F(3,1757) = 34.46, p < .001$, Aprenda reading $F(2,1391) = 27.40, p < .001$, and Aprenda math $F(2,1393) = 20.38, p < .001$ scores. The values of eta squared were $\eta^2 = .05, \eta^2 = .06, \eta^2 = .04$, and $\eta^2 = .03$, respectively. Despite the statistical significance found

between groups, it appears that the kindergarten group effects on test scores were small.

Pairwise comparisons of mean scores on Stanford and Aprenda tests among the kindergarten groups were conducted using the Bonferroni correction. For Stanford, because there were four comparisons, a $p < .013$ level was used to identify statistically significant differences ($.05/4 = .013$). For Aprenda, a $p < .017$ level was used.

Stanford 10 Posthoc Results

Results of pairwise comparisons showed that AVANCE students scored significantly higher on both the Stanford reading and math subtests compared to their economically-disadvantaged counterparts who were not enrolled in an HISD prekindergarten program the previous school year. In terms of how AVANCE students performed compared to their economically-disadvantaged peers who attended an HISD prekindergarten program, scores on both subtests between these two groups were not statistically significant. When compared to their non-economically-disadvantaged counterparts, AVANCE students scored lower on both the Stanford subtests, but only the mean difference in the mathematics subtest was statistically significant. In other words, the

Table 2: Means and Standard Deviations of Stanford 10 Reading and Math Normal Curve Equivalent (NCE) Scores by Economic Status and Prekindergarten Programs Among Kindergarteners in Comparable Title I Schools

	AVANCE [†]			Non-AVANCE Econ. Disadvantaged Non-HISD Pre-K			Non-AVANCE Econ. Disadvantaged HISD Pre-K			Non-AVANCE Non-Disadvantaged		
	n	M NCE	SD	n	M NCE	SD	n	M NCE	SD	n	M NCE	SD
<u>Stanford 10</u>												
Reading	89	51.12 ^{a**}	18.71	379	42.19 ^a	18.49	1015	50.92	19.37	267	57.09	21.09
Math	90	48.66 ^{b**c}	21.88	380	40.04 ^b	22.13	1018	49.15	21.06	269	57.01 ^{c**}	21.07

Notes. Differences in means with similar superscripts were statistically significant (reported only for AVANCE vs. other groups).

[†] AVANCE students in the current analysis include students dually enrolled in HISD. *** $p < .001$; ** $p < .013$; * $p < .05$.

Table 3: Means and Standard Deviations of Stanford 10 Reading and Math Curve Equivalent (NCE) Scores by Prekindergarten Programs Among Kindergarteners in Comparable Title I Schools

	AVANCE [†]			Non-AVANCE Econ. Disadvantaged Non-HISD Pre-K			Non-AVANCE Econ. Disadvantaged HISD Pre-K		
	n	M NCE	SD	n	M NCE	SD	n	M NCE	SD
<u>Apreda 3</u>									
Reading	102	65.31 ^{d***}	20.52	200	52.84 ^d	20.28	1089	64.73	21.33
Math	103	72.93 ^{e***}	22.01	200	62.36 ^e	22.84	1090	72.45	20.25

Notes. Differences in means with similar superscripts were statistically significant (Reported only for AVANCE vs. other groups).

*** $p < .001$; ** $p < .017$; * $p < .05$. No economically disadvantaged students took Apreda. [†] AVANCE students in the current analysis include students dually enrolled in HISD.

AVANCE students scored significantly lower in math than their non-economically-disadvantaged Title I peers (Table 2).

Apreda 3 Posthoc Results

A similar pattern of results emerged between groups in terms of the Apreda scores. Results of pairwise comparisons showed that AVANCE students scored significantly higher on both the Apreda reading and math subtests compared to their economically-disadvantaged counterparts who were not enrolled in an HISD prekindergarten program the previous school year. Once again, the difference in the scores on both subtests between the AVANCE students and their economically-disadvantaged peers who were enrolled in an HISD prekindergarten program were not statistically significant. The non-economically-disadvantaged group was not included in the ANOVAs examining Apreda mean score differences, because no students who attended the same Title I schools as the AVANCE students and who took the Apreda were identified as non-economically-disadvantaged (Table 3).

How did AVANCE students’ performance on the TPRI compare to the performance of their Title I school peers?

Table 4 displays the percent of students who scored “developed” according to the TPRI Screening Assessment. These results are aggregated by the same kindergarten subgroups identified previously. Some of the same patterns in results emerged between the four groups. A higher percentage of AVANCE students were identified as “developed” on the screening assessment (52.3 percent) when compared to their economically-disadvantaged peers who were not enrolled in HISD prekindergarten (29.0 percent). Once again, however, the percent of students who scored “developed” among AVANCE students was comparable to the percent that scored developed among economically-disadvantaged students who had attended prekindergarten the previous year (51.2 percent). In addition, a smaller percentage of AVANCE students were identified as “developed” when compared to their non-economically-disadvantaged counterparts (60.6 percent).

Because it is optional for students who are deemed as “developed” on the screening section to take Inventories 1 and 6, the only students included in the analyses of the TPRI inventories were those identified by the screening section as “still developing.” The results of the TPRI inventories are displayed in **Table 5**. On the TPRI Rhyming inventory, the AVANCE group had a higher percentage of “developed” students (29.3 percent) when compared to their economically-disadvantaged peers who had not been enrolled in an HISD prekindergarten program (21.7 percent). The percent of students who scored “developed” among AVANCE students was comparable to the percent that scored “developed” among economically-disadvantaged students who had attended prekindergarten (29.8 percent). However, a lower percentage of AVANCE students were identified as “developed” on the Rhyming inventory when compared to their non-economically-disadvantaged peers (41.7 percent). On the Letter Name Identification inventory, the AVANCE group had the highest percentage of students identified as “developed” (68.3 percent) compared to the three comparison groups.

How did AVANCE students’ performance on the Tejas LEE compare to the performance of their Title I school peers?

Table 6 displays the percent of students identified as performing either at the “desarrollado/developed” level or at “nivel esperado/expected” level on Inventories 1 (*Identificación de las letras/Letter Naming*) and 6 (*Identificación del sonido inicial/Identify Initial Sound*) of the Tejas LEE. On the Letter Naming inventory, once again, a higher percentage of AVANCE students were identified as performing at the “developed/expected” level (87.9 percent) compared to their economically-disadvantaged peers (46.2 percent) who were not enrolled in HISD prekindergarten the previous year and compared to their non-economically-disadvantaged counterparts (75.0 percent). At the same time, the percent of economically-disadvantaged students who did attend HISD prekindergarten the previous year scoring at the “developed/Expected” level (88.6 percent) was slightly higher than the percent of AVANCE students scoring at this level. A similar pattern was found relative to the results of the Identify Initial Sound inventory. Again, a higher percentage of AVANCE students were identified at the “developed/expected” level (93.9 percent) compared to their economically-disadvantaged peers (79.5 percent) who had not been enrolled in HISD prekindergarten and when compared to their non-economically-disadvantaged counterparts (86.4 percent). The percent

among the economically-disadvantaged students who had been enrolled in HISD prekindergarten the previous year (94.1 percent) was slightly higher than the percent of AVANCE students scoring at this level.

Discussion

AVANCE Houston Inc. aims to monitor the academic achievement of their students over a twelve-year period until graduation for the purposes of determining the short and long-term effects of receiving the AVANCE Houston, Inc. Head Start intervention. The AVANCE educational intervention may include the Head Start stand-alone program or the Head Start/HISD collaborative program where prekindergarten students receive instruction from both an AVANCE teacher and an HISD teacher. Working toward the goal of tracking the academic achievement of AVANCE students in both of these programs, the current evaluation provided the first analysis of AVANCE students’ level of academic achievement. To conduct this analysis, the kindergarten test performance of the 2009 AVANCE prekindergarten cohort was compared to the test performance of economically-disadvantaged kindergarteners who had or had not been enrolled in HISD prekindergarten and to non-economically-disadvantaged kindergarteners who attended the same Title I schools. For the students that had not enrolled in an HISD prekindergarten program the previous year, it is not known whether they had received some other form of early childhood education. However, based on test scores, it seems unlikely that students within this group had received a formal early childhood intervention.

Overall, preliminary results suggest that students who receive the AVANCE Houston, Inc. Head Start intervention are benefitting academically the year following the Head Start intervention compared to their economically-disadvantaged peers attending the same Title I schools who were not enrolled in an HISD prekindergarten program the previous year. All of the assessment results that were examined in this evaluation consistently support this finding. Results from this evaluation also provide evidence that economically-disadvantaged students are benefitting from either attending AVANCE Head Start or prekindergarten in HISD since these two groups perform at about the same level and do significantly better than economically-disadvantaged students who may have not received a formal early childhood education. In addition, AVANCE Head Start students scored almost on par with their non economically-disadvantaged peers attending the same Title I schools on the TPRI and Tejas LEE. In conclusion, the current findings seem to corroborate previous research that has examined the short-term effects of a Head Start

Table 4: Percent of Students Identified as “Developed” at the Beginning of Year Based on the Screening Section of the TPRI by Economic Status and Prekindergarten Programs

	AVANCE [†]	Non-AVANCE Econ. Disadvantaged Non-HISD Pre-K	Non-AVANCE Econ. Disadvantaged HISD Pre-K	Non-AVANCE Non-Disadvantaged
n Took TPRI BOY	86	331	929	207
n "Developed" on Screening	45	36	476	129
% "Developed" on Screening	52.3	29.0	51.2	60.6

[†] Note: AVANCE students in the current analysis include students dually enrolled in HISD.

Table 5: Percent of “Still Developing” Screened Students Identified as “Developed” at the Beginning of Year on Inventories 1 and 6 of the TPRI by Economic Status and Prekindergarten Programs

	AVANCE [†]	Non-AVANCE Econ. Disadvantaged Non-HISD Pre-K	Non-AVANCE Econ. Disadvantaged HISD Pre-K	Non-AVANCE Non-Disadvantaged
n “Still Developing” on Screening	41	235	453	84
n “Developed” on Rhyming	12	51	135	35
% “Developed” on Rhyming	29.3	21.7	29.8	41.7
n “Developed” on Letter ID	28	67	274	55
% “Developed” on Letter ID	68.3	28.5	60.5	65.5

[†] Note: AVANCE students in the current analysis include students dually enrolled in HISD.

Table 6: Percent of Students Identified Performing At least at the Expected Level (NE) at the Beginning of Year on Inventories 1 and 6 of the Tejas Lee by Economic Status and Prekindergarten Programs

	AVANCE [†]	Non-AVANCE Econ. Disadvantage Non-HISD Pre-K	Non-AVANCE Econ. Disadvantage HISD Pre-K	Non-AVANCE Non-Disadvantaged
n Took Tejas Lee BOY	99	171	1012	44
n “Developed/Expected Level” on Letter Name	87	79	897	33
% “Developed/Expected Level” on Letter Name	87.9	46.2	88.6	75.0
n “Developed/Expected Level” on ID Sound	93	136	952	38
% “Developed/Expected Level” on ID Sound	93.9	79.5	94.1	86.4

[†] Note: AVANCE students in the current analysis include students dually enrolled in HISD.

intervention for students who are economically disadvantaged (see Currie, 2001).

Future evaluations will attempt to include a comparison of the academic performance levels between former students of the AVANCE Houston Inc. Head Start program and students who enter the district from other Houston area collaborative Head Start programs such as Gulf Coast Community Services Association (GCCSA), Harris County Department of Education (HCDE), and Neighborhood Centers Incorporated (NCI). Furthermore, future evaluations of the Houston area Head Start programs should include information regarding their curriculum and instruction and other program characteristics such as class sizes, teacher education, and child-staff ratio. Collecting information on these factors may help explain differences in student performance between early childhood education programs if they do indeed exist.

References

- Currie, J. (2001). Early childhood intervention programs: What do we know? *Journal of Economic Perspectives*, *15*, 213-238.
- Nisbitt, R.E. (2009). Education is all in your mind. Retrieved April 19, 2011, from <http://www.nytimes.com/2009/02/08/opinion/08nisbett.html>.
- University of Texas System/Texas Education Agency. (2010). Texas primary reading inventory. Austin, TX.
- 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*, 134-152.

For additional information contact the HISD
Department of Research and Accountability at
713-556-6700 or e-mail Research@Houstonisd.org.

**APPENDIX A
TITLE I SCHOOLS**

SCHOOL NAME	GR LEVEL
BARRICK	EE-5
BERRY	EE-5
PAIGE, RODERICK	EE-5
DURHAM	EE-5
BROWNING	EE-5
BURBANK	EE-5
LYONS	EE-5
COOP	EE-5
DECHAUMES	EE-5
DURKEE	EE-5
FIELD	EE-5
GARDEN OAKS	EE-6
HARRIS, JR	EE-5
HIGHLAND HEIGHTS	EE-5
ISAACS	EE-6
JANOWSKI	EE-5
JEFFERSON	EE-5
LOOSCAN	EE-5
MCDADE	EE-6
OAK FOREST	EE-5
OSBORNE	EE-5
ROOSEVELT	EE-5
ROSS	EE-5
SCARBOROUGH	EE-5
SMITH, KATE	EE-5
STEVENS	EE-5
WHARTON ACADEMY	EE-8
BENBROOK	EE-5
GARCIA	EE-5
HERRERA	EE-5
MARTINEZ, C	EE-5
CARRILLO	EE-5
COOK JR., FELIX	PK-5
KETELSEN	EE-5