



EVALUATION REPORT

BUREAU OF PROGRAM EVALUATION

Volume 7, Issue 2, May 2013

The 2012–2013 HISD Kindergarten Academic Performance of the 2011–2012 AVANCE Prekindergarten Cohort

By Danya M. Corkin, Ph.D.

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. One of the main purposes of Head Start is to help children from low-income backgrounds succeed in kindergarten and beyond. This report examines the academic performance of AVANCE Houston Inc. students, including those dually enrolled in the Houston Independent School District (HISD), by comparing their HISD kindergarten academic performance to the performance of demographically similar peers. Specifically, this study provides a comparison of the 2012–2013 Aprenda 3 and Stanford 10 test scores of 329 kindergarten students who were enrolled in AVANCE Houston Inc. in 2011–2012 to the scores of kindergarten students who were enrolled in HISD prekindergarten that were matched by age, gender, ethnicity, economic status, limited English proficiency (LEP), and special education status using Propensity Score Matching analysis (PSM; Rosenbaum & Rubin, 1983). Findings suggest that the performance of kindergarteners who attended AVANCE was comparable to the performance of kindergarteners who attended HISD prekindergarten after controlling for these demographic variables. Student performance on the Texas Primary Reading Inventory (TPRI) and Tejas LEE was also assessed to determine the percentage 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).

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 poor communities by improving parenting skills, increasing literacy, and enhancing school-readiness. AVANCE provides disadvantaged families with the following services: parent-child education programs, early childhood development classes, adult and computer literacy, fatherhood instruction, home visitations, counseling referrals, medical/psychological referrals, General Education Diploma (GED) classes, English as a Second Language (ESL) classes, and Head Start programs. AVANCE offers Head Start through their standalone centers, and partners with HISD to provide Head Start instructors at HISD campuses.

Results of previous research examining the effects of Head Start on students’ academic achievement have varied in terms of the extent that Head Start improves the school readiness of low-income children (see

Currie, 2001; Nisbitt, 2009). Researchers have proposed that the effects of a Head Start intervention have varied because of several methodological factors and differences in activity levels of control groups (Shager et al., 2013). For example, past research has compared the performance of Head Start students with the performance of students who did not attend Head Start without accounting for the differences in educational experiences and demographic characteristics between groups (see Zhai, Brooks-Gunn, & Waldfogel, 2011). Most recently, however, findings from a meta-analytic study of Head Start research indicated that Head Start overall is effective in improving students’ short-term cognitive and achievement outcomes once accounting for research design factor differences (Shager et al., 2013).

The current evaluation examines the effect of the AVANCE intervention by comparing AVANCE student performance to the performance of students who received other early childhood education (ECE) interventions, namely HISD prekindergarten, and to the performance of students who, to the extent of our knowledge, did not receive any formal ECE

intervention. In addition, several important demographic factors associated with academic performance including gender, ethnicity, economic status, limited English proficiency (LEP) classification and special education status were controlled for in the current analyses.

Data and Method

Data Collection

Data compiled for this report includes 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 demographic data were also extracted from PEIMS. Student performance data were collected from the following test assessments: the Aprenda: La Prueba de Logros en Español (Aprenda 3), the Stanford Achievement Test (Stanford 10), the El Inventario de Lectura en Español de Tejas (Tejas LEE), and the Texas Primary Reading Inventory (TPRI).

Instruments

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 used the Aprenda normal curve equivalent scores (NCE; a normalized standard score) from the reading and mathematics subtests to assess student achievement.

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 is reported in the current evaluation to assess student achievement.

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. The Tejas LEE is administered three times a year. Similar to the TPRI, it can be used to determine appropriate instructional interventions. The levels of performance on the Beginning-of-Year inventories 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 3 (*Conocimiento de rimas/Rhyming*) assessing phonological awareness.

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. The TPRI is administered three times a year. 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*).

Study Sample and Analysis

AVANCE Houston Inc. provided HISD with a list of students enrolled in their program at the prekindergarten level in 2011–2012. Of the 656 students on the list, 329 were identified as enrolled in HISD kindergarten based on the district's PEIMS 2012–2013 database. Of the 329 AVANCE students, approximately 47.1 percent had been dually enrolled in HISD and 52.9 percent had been enrolled in the AVANCE standalone program. Following the identification of the 329 AVANCE kindergarteners, several different analyses were conducted to determine the effect of the AVANCE intervention on student performance in kindergarten. The first analysis conducted was Propensity Score Matching (PSM; Rosenbaum & Rubin, 1983) to create control groups with very similar propensity scores to the AVANCE student sample using STATA 12.0. Propensity score analysis may be used in program evaluation when researchers need to evaluate treatment effects and randomized experiments are not possible (Guo & Fraser, 2010). The nearest neighbor without replacement matching method (greedy matching) was used in this study. AVANCE students were matched to HISD kindergarten students who attended HISD prekindergarten the year prior who took the Stanford 10 achievement test (control group 1) or who took the Aprenda 3 achievement test (control group 2). These groups were matched by "key" baseline demographics;

namely age, gender, economic disadvantage, LEP, and special education status. Once control groups were identified, analysis of variance (ANOVAs) tests were run to confirm that no significant differences ($p < .05$) existed across groups on the key baseline demographic variables identified. For the control group who took the Stanford exam, significant differences were found in the percentage of students that were identified as economically disadvantaged; therefore, economic disadvantage was included as a variable in a two-way MANOVA analysis. Among student groups who took the Aprenda, no significant differences were found in any of the key baseline demographics; thus, a MANOVA was conducted to evaluate the effect of AVANCE on Aprenda scores.

AVANCE students' performance was also compared to the performance of students who did not attend HISD prekindergarten and who were not enrolled in any of the local Head Start agencies the previous year. Because some of the baseline demographic information (i.e., economic status) was not available for students who did not attend HISD prekindergarten or Head Start, some assumptions were made when it came to students' demographic characteristics in prekindergarten. Specifically, the economic status, LEP status, and special education classification data in kindergarten were included as control variables in several multiple linear regression analyses.

Table 1 provides demographic information of the 2011–2012 AVANCE Head Start students in HISD kindergarten in 2012–2013. The first column contains demographic information for all of the AVANCE students identified in HISD while columns two and three provide a breakdown of the demographics by program type (see **Appendix A** for schools attended). The majority of students enrolled in the AVANCE

Head Start program were Hispanic and economically disadvantaged. Comparing the demographics across both AVANCE programs, a higher percentage of students enrolled in the AVANCE standalone program were female, African American, and classified as limited English proficient when compared to students in the AVANCE dual enrollment program.

Did significant differences exist between students who were enrolled in AVANCE and students enrolled in HISD prekindergarten on the kindergarten Aprenda and Stanford achievement tests when matching groups by demographic factors?

Aprenda 3 Results

After conducting PSM to create control groups with very similar propensity scores to the AVANCE student group, a one-way multivariate analysis of variance (MANOVA) was conducted to examine the extent that being enrolled in AVANCE had an effect on Aprenda reading and Aprenda math NCE scores. Results of the MANOVA, presented in **Table 2**, showed no statistically significant differences between kindergarten students who were enrolled in the AVANCE program (includes students from both programs) and HISD prekindergarten the previous year in Aprenda reading $F(1,276) = .05, p > .05$ and Aprenda math scores $F(1,276) = .03, p > .05$.

Stanford 10 Results

A two-way MANOVA was conducted to examine the extent that AVANCE and economic status had an effect on Stanford reading and Stanford math NCE scores. Results of the MANOVA indicated that there were no statistically significant differences

Table 1: 2011–2012 Demographics of AVANCE Students in 2012–2013 HISD Kindergarten

| | AVANCE [†] (N = 329) | | AVANCE HISD Dual Enrollment (N = 155) | | AVANCE Standalone (N = 174) | |
|----------------------------|----------------------------------|------|---|------|-----------------------------------|------|
| | N | % | N | % | N | % |
| Age | | | | | | |
| Four | 110 | 33.4 | 49 | 31.6 | 61 | 35.1 |
| Five | 219 | 66.6 | 106 | 68.4 | 113 | 64.9 |
| Gender | | | | | | |
| Female | 166 | 50.5 | 72 | 46.5 | 94 | 54.0 |
| Male | 163 | 49.5 | 83 | 53.5 | 80 | 46.0 |
| Race/Ethnicity | | | | | | |
| African American | 37 | 11.2 | 5 | 3.2 | 32 | 18.4 |
| Hispanic | 290 | 88.1 | 148 | 95.5 | 142 | 81.6 |
| White and Other | -- | -- | -- | -- | -- | -- |
| Economically Disadvantaged | 315 | 95.7 | 148 | 95.5 | 167 | 96.0 |
| Limited English Proficient | 188 | 57.1 | 82 | 52.9 | 106 | 60.9 |
| Special Education | 22 | 6.7 | 11 | 7.1 | 11 | 6.3 |

Note: Data retrieved from PEIMS 2011–2012 and 2012–2013. [†]AVANCE students include students dually enrolled in HISD and in the standalone program. "--" indicates fewer than 5 students.

between kindergarten students who were enrolled in an AVANCE program or HISD prekindergarten in Stanford reading $F(1,324) = .46, p > .05$ and Stanford math $F(1,324) = 0.26, p > .05$. In addition, there were no statistically significant differences between kindergarten students who were economically disadvantaged versus those who were non-economically disadvantaged in Stanford reading $F(1,324) = 1.18, p > .05$ and Stanford math $F(1,324) = 0.74, p > .05$. Finally, the interaction of program type and economic status emerged as non-significant. Surprisingly, economic status did not have a significant effect on Stanford scores; however, this may be attributed to the fact that such a small number of AVANCE students were non-economically-disadvantaged. Because only one student who attended AVANCE was classified as non-economically-disadvantaged in prekindergarten, only the scores among economically disadvantaged groups are reported in **Table 3**.

To what extent did the AVANCE intervention have an effect on kindergarten Aprenda and Stanford performance after accounting for demographic factors?

To examine Aprenda and Stanford performance differences between students who were enrolled in AVANCE versus students who did not attend HISD prekindergarten or any known local Head Start interventions, hierarchical multiple linear regression analyses were conducted for each test by subject. Because some baseline data were not available for the kindergarten group of students who were not identified as receiving a formal early childhood intervention, some assumptions were made when it came to their economic status, LEP classification and special education status in prekindergarten. Specifically, the information entered in the model for these demographics pertained to their kindergarten year. In step 1 of the models, age, gender, economic status, LEP classification, and special education status were entered. In step 2, a categorical variable was entered where 1 represented students who had been enrolled in AVANCE the previous year and 0 represented students

who had not attended HISD prekindergarten and who had not been enrolled in any of the local Head Starts the previous year.

Appendix 3 Results

Results of the hierarchical regressions predicting Aprenda reading and Aprenda math NCE scores are reported in **Table 4**. Step 1 of the model predicting Aprenda reading was significant, $F(5,1012) = 7.41, p < .001, R^2 = 3\%$. Among the demographic variables, age ($\beta = .18, p < .001$) was the only significant positive predictor of Aprenda reading NCE scores. In other words, older students tended to score higher on the Aprenda reading exam compared to their younger counterparts. In step 2, upon entering the variable representing the AVANCE intervention, the model remained significant, $F(6,1011) = 15.12, p < .001, R^2 = 8\%$. Age ($\beta = .17, p < .001$) remained a significant positive predictor and the AVANCE intervention ($\beta = .22, p < .001$) also emerged as a positive predictor of Aprenda reading scores. After accounting for age, gender, economic status, LEP classification, and special education status, students who were enrolled in AVANCE tended to score higher on the Aprenda reading subtest than their counterparts who did not attend AVANCE or HISD prekindergarten. The effect of the AVANCE intervention on Aprenda reading is small (it accounted for 5% of the variation in scores) yet practically significant (Ferguson, 2009).

For the model predicting Aprenda math, step 1 was significant, $F(5,1019) = 7.44, p < .001, R^2 = 3\%$. Among the demographic variables, age ($\beta = .17, p < .001$) was the only significant positive predictor of Aprenda math NCE scores. Again, older students tended to score higher on the Aprenda math exam compared to their younger counterparts. In step 2, upon entering the variable representing the AVANCE intervention, the model remained significant, $F(6,1013) = 12.81, p < .001, R^2 = 7\%$. Age ($\beta = .17, p < .001$) remained a significant positive predictor and enrollment in AVANCE ($\beta = .19, p < .001$) also emerged as a positive predictor of Aprenda math scores. Again, the effect of AVANCE on Aprenda math is small (accounted for 4% of the variation in scores); however, it should be considered a practically significant effect (Ferguson, 2009).

Table 2: Means and Standard Deviations of 2012–2013 Aprenda 3 Reading and Math Normal Curve Equivalent (NCE) Scores by AVANCE Versus HISD Prekindergarten Comparison Group

| | AVANCE [†] | | | Non-AVANCE HISD PreK | | |
|------------------|---------------------|----------|-------|-------------------------|----------|-------|
| | n | M NCE | SD | n | M NCE | SD |
| <u>Aprenda 3</u> | | | | | | |
| Reading | 144 | 65.36 | 22.24 | 134 | 65.94 | 22.51 |
| Math | 144 | 73.46 | 21.59 | 134 | 73.02 | 21.74 |

Notes. [†] AVANCE students in the current analysis include students dually enrolled in HISD and in the standalone program.

Table 3: Means and Standard Deviations of 2012–2013 Stanford 10 Reading and Math Normal Curve Equivalent (NCE) Scores by AVANCE Versus HISD Prekindergarten Comparison Group

| | AVANCE [†] Economically-Disadvantaged | | | Non-AVANCE HISD PreK Economically-Disadvantaged | | |
|--------------------|---|----------|-------|---|----------|-------|
| | n | M NCE | SD | n | M NCE | SD |
| Stanford 10 | | | | | | |
| Reading | 165 | 48.95 | 18.24 | 148 | 55.20 | 19.91 |
| Math | 165 | 49.86 | 20.04 | 148 | 54.57 | 19.85 |

Notes. [†] AVANCE students in the current analysis include students dually enrolled in HISD and in the standalone program.

These findings indicate that after controlling for key demographic variables: a) students who are older perform better on the Aprenda subtests than younger students, and b) AVANCE students perform better on the Aprenda reading and math subtests compared to their counterparts who were not enrolled in an HISD prekindergarten program or Head Start the previous school year.

Stanford 10 Results

Results of the hierarchical regressions predicting Stanford reading and Stanford math NCE scores are reported in **Table 5**. Step 1 of the model predicting Stanford reading was significant, $F(5,4082) = 174.80$, $p < .001$, $R^2 = 18\%$. Age ($\beta = .13$, $p < .001$) and gender ($\beta = .08$, $p < .001$) were significant positive predictors of Stanford reading NCE scores. Whereas, economic disadvantage ($\beta = -.37$, $p < .001$), limited English proficiency ($\beta = -.07$, $p < .001$), and special education status ($\beta = -.04$, $p < .01$) were significant negative

predictors of Stanford reading scores. In step 2, upon entering the variable representing enrollment in AVANCE, the model remained significant, $F(5,4081) = 146.96$, $p < .001$, $R^2 = 18\%$. All of the demographic variables in step 1 remained significant predictors and AVANCE ($\beta = .04$, $p < .05$) emerged as a positive predictor of Stanford reading scores. In other words, students who were enrolled in AVANCE tended to score higher on the Stanford reading subtest compared to their counterparts who did not attend AVANCE or HISD prekindergarten after accounting for demographic variables. However, the effect of AVANCE on Stanford reading scores is too small to be considered a practically significant effect (Ferguson, 2009).

For the model predicting Stanford math, step 1 was significant, $F(5,4105) = 190.38$, $p < .001$, $R^2 = 19\%$. Age ($\beta = .17$, $p < .001$) and gender ($\beta = .05$, $p < .01$) were significant positive predictors of Stanford

Table 4: Hierarchical Linear Regression Predicting 2012–2013 Aprenda 3 Reading and Math Normal Curve Equivalent (NCE) Scores

| Predictor | Aprenda Reading | | Aprenda Math | |
|-----------------------|-----------------|---------|--------------|---------|
| | β | β | β | β |
| Step 1 | | | | |
| Age | .18*** | .17*** | .19*** | .17*** |
| Gender | .04 | .04 | .03 | .03 |
| Economic-disadvantage | .01 | -.00 | -.01 | -.02 |
| LEP | .03 | .00 | .01 | -.01 |
| Special Ed. | .00 | -.02 | -.02 | -.04 |
| Step 2 | | | | |
| AVANCE | | .22*** | | .19*** |
| R^2 | .03*** | .08*** | .03*** | .07*** |
| ΔR^2 | | .05*** | | .04*** |

Notes. β indicates standardized regression coefficient. *** $p < .001$.

Table 5: Hierarchical Linear Regression Predicting 2012–2013 Stanford 10 Reading and Math Normal Curve Equivalent (NCE) Scores

| Predictor | Stanford Reading | | Stanford Math | |
|-----------------------|------------------|---------|---------------|---------|
| | β | β | β | β |
| Step 1 | | | | |
| Age | .13*** | .13*** | .17*** | .17*** |
| Gender | .08*** | .07*** | .05** | .05** |
| Economic-disadvantage | -.37*** | -.38*** | -.36*** | -.36*** |
| LEP | -.07*** | -.08*** | -.10*** | -.10*** |
| Special Ed. | -.04** | -.04** | -.08*** | -.08*** |
| Step 2 | | | | |
| AVANCE | | .04* | | .06*** |
| R^2 | .18*** | .18*** | .19*** | .19*** |
| ΔR^2 | | .00* | | .00*** |

Notes. β indicates standardized regression coefficient. * $p < .05$. ** $p < .01$. *** $p < .001$.

math NCE scores, whereas, economic disadvantage ($\beta = -.37, p < .001$), limited English proficiency ($\beta = -.10, p < .001$), and special education ($\beta = -.08, p < .001$) were significant negative predictors of Stanford math scores. In step 2, upon entering the variable representing enrollment in AVANCE, the model remained significant, $F(6,4104) = 146.96, p < .001, R^2 = 19\%$. All of the demographic variables in step 1 remained significant predictors and AVANCE ($\beta = .06, p < .001$) emerged as a statistically significant positive predictor of Stanford math scores. Students who were enrolled in AVANCE tended to score higher on the Stanford math subtest compared to their counterparts who did not attend AVANCE or HISD prekindergarten after accounting for the demographic factors included in the model. Again, however, the effect of AVANCE on Stanford math scores is too small to be considered practically significant (Ferguson, 2009).

These findings indicate that students who are older perform better on the Stanford subtests than younger students. In addition, females tend to have higher scores on the Stanford subtests than males while students who are economically disadvantaged, limited English proficient, and classified as special education tend to have lower scores compared to their counterparts without each of those groupings.

In sum, AVANCE students perform better on the Stanford reading and math subtests than their counterparts who were not enrolled in an HISD prekindergarten program or Head Start the previous school year after controlling for age, gender, economic status, LEP classification, and special education status. However, the effect of the AVANCE intervention on Stanford scores is too small to be considered as practically significant (Ferguson, 2009).

How do the Aprenda and Stanford reading and math NCE scores compare across AVANCE students dually enrolled in HISD and students in the standalone program?

Further analysis was conducted to examine the performance differences between the AVANCE groups because the AVANCE group in the previous analyses included students who were dually enrolled in HISD prekindergarten and those who were enrolled in AVANCE’s standalone program. Findings indicated that AVANCE students dually enrolled in HISD performed better on the Aprenda and Stanford reading and math subtests compared to students who were enrolled in AVANCE’s standalone program as reported in **Table 6**. **Appendix B** provides a further breakdown of how students performed by AVANCE centers.

Table 6: Means and Standard Deviations of 2012–2013 Aprenda 3 and Stanford 10 Reading and Math Normal Curve Equivalent Scores by AVANCE Programs

| | AVANCE HISD Dual | | | AVANCE Standalone | | |
|--------------------|---------------------|-------|-------|----------------------|-------|-------|
| | n | M | SD | n | M | SD |
| <u>Aprenda 3</u> | 72 | | | 76 | | |
| Reading | | 67.09 | 19.18 | | 63.18 | 24.78 |
| Math | | 77.47 | 17.93 | | 69.17 | 24.12 |
| <u>Stanford 10</u> | 80 | | | 92 | | |
| Reading | | 51.20 | 16.60 | | 47.31 | 20.10 |
| Math | | 53.85 | 18.51 | | 45.98 | 20.91 |

What are the odds that a student who was enrolled in AVANCE scored at the “developed” level (not at risk for reading difficulties) on the 2012–2013 beginning-of-year TPRI screening assessment in kindergarten after accounting for demographic factors?

A binary logistic regression was conducted to determine the likelihood of AVANCE students scoring at the “developed” level on the TPRI screening assessment after controlling for age, gender, economic status, LEP classification, and special education status. The first step of the model included the demographic controls and the second step included whether students were enrolled in AVANCE, where 1 represented students who had been enrolled in AVANCE the previous year and 0 represented students who had not attended HISD prekindergarten and who had not been enrolled in any known local Head Starts the previous year.

Table 7 displays the results for the prediction of scoring “developed” on the TPRI screening assessment. In the first step, the omnibus test indicated that there was a good model fit ($\chi^2 = 660.08, p < .001$) with age, gender, economic-disadvantage, LEP, and special education status emerging as significant predictors of scoring “developed” on the TPRI screening. Specifically, when holding all other variables constant, a one-unit increase in age increased the odds of scoring “developed” by 60 percent. Also, when holding all other variables constant, females had a 1.22 times greater probability of scoring “developed” on the TPRI screening assessment compared to their male counterparts. Students classified as economically disadvantaged, LEP, and special ed. had a 77 percent, 45 percent, and 53 percent lower probability, respectively, of scoring “developed” on the TPRI

Table 7: Hierarchical Binary Logistic Regression on Scoring “Developed” on the 2012–2013 TPRI Beginning-of-Year Screening Assessment

| Predictor | Exp(b) | Exp(b) |
|----------------------------------|-----------|-----------|
| Step 1 | | |
| Age | 1.60*** | 1.58*** |
| Gender | 1.28** | 1.27** |
| Economic-disadvantage | .20*** | .19*** |
| LEP | .51*** | .48*** |
| Special Ed. | .42** | .38** |
| Step 2 | | |
| AVANCE | | 2.08*** |
| -2LL | 4534.26 | 4515.56 |
| Model Chi-square | 660.08*** | 678.78*** |
| Nagelkerke Pseudo R ² | 0.22 | 0.22 |

n = 3,775. **p < .01. ***p < .001.

screening assessment compared to their counterparts not falling under these classifications.

Upon entering the AVANCE intervention variable (step 2), the omnibus test indicated that the model remained a good fit ($\chi^2 = 678.78, p < .001$). Age, gender, economic disadvantage, LEP, and special education status remained significant predictors of scoring “developed” on the TPRI screening. In addition, when controlling for the demographic variables, AVANCE was a significant predictor in the model. Specifically, when holding all other variables constant, AVANCE students were 1.74 times more likely to score “developed” on the TPRI screening assessment than students who had not attended HISD prekindergarten and who had not been enrolled in any known local Head Starts.

What percentage of AVANCE students scored at the developed level on the beginning-of-year Tejas LEE inventories and how did that percentage compare to the percentage developed among kindergarteners who attended HISD prekindergarten and those who did not attend HISD prekindergarten?

The Tejas LEE was used to assess the kindergarten Spanish reading skills of AVANCE students and comparison groups at the beginning of kindergarten. To reiterate the Tejas LEE skill level represented by the designated scores, a “developed” score indicates that the student has mastered the skill, while an “expected” level score indicates that the student is performing at the level that is expected for that grade and for that point in time in the academic year. Both a developed or expected level score are considered acceptable (i.e., the students’ reading ability at this point is not considered problematic; Tejas LEE, 2010). **Table 8** displays the percentage of students identified as performing at the “desarrollado/developed” level and at “nivel esperado/expected” level on Inventories 1 (*Identificación de las letras/Letter Naming*) and Inventory 3 (*Conocimiento de rimas/Rhyming*) of the Tejas LEE.

On the Letter Naming inventory, a slightly lower percentage of AVANCE students were identified as performing at the developed or expected level (88.8 percent) compared to their counterparts who attended HISD prekindergarten (93.1 percent). In addition, the percentage of AVANCE students performing at the developed or expected level was substantially larger than that of students who did not attend AVANCE and who were not enrolled in HISD prekindergarten the previous year (52.5 percent).

On the Rhyming inventory, 100 percent of the students in all three groups scored either at the developed or at the expected level. However, the AVANCE group had a higher percentage of students score at the developed level (22.4 percent) when compared to the student group who did not attend AVANCE and who did not attend HISD prekindergarten the previous year (11.3 percent).

What percentage of AVANCE students scored at the developed level on the beginning-of-year TPRI screening assessment and inventories and how did that percentage compare to the percentage developed among kindergarteners who attended HISD prekindergarten and those who did not attend HISD prekindergarten?

Table 8: Percentage of Students Identified as Developed or Expected Performance Based on 2012–2013 Beginning-of-Year Inventories of the Tejas LEE by AVANCE versus Non-HISD-PreK and HISD PreK Groups

| | AVANCE† | | | Non-AVANCE Non-HISD PreK | | | Non-AVANCE HISD PreK | | |
|--------------------|---------|------|------|--------------------------|------|------|----------------------|------|------|
| | n | %D | %NE | n | %D | %NE | n | %D | %NE |
| INV1-Letter Naming | 152 | 50.0 | 38.8 | 993 | 20.0 | 32.5 | 5181 | 62.5 | 30.6 |
| INV3-Rhyming | 152 | 22.4 | 77.6 | 993 | 11.3 | 88.4 | 5181 | 25.1 | 74.9 |

Notes. †AVANCE students in the current analysis include students dually enrolled in HISD and in the standalone program. D = “Developed” N.E. = “Expected Level”

Table 9: Percentage of Students Identified as Developed at the Beginning-of-Year 2012–2013 Based on Screening and Inventories of the TPRI by AVANCE versus Non-HISD-PreK and HISD PreK Groups

| | AVANCE† | | Non-AVANCE Non-HISD PreK | | Non-AVANCE HISD PreK | |
|---------------------------------|---------|------|-----------------------------|------|-------------------------|------|
| | n | %D | n | %D | n | %D |
| Screening Status | 169 | 52.1 | 3717 | 55.2 | 5325 | 62.2 |
| PA-1-Rhyming | 81 | 28.4 | 1664 | 25.6 | 2011 | 34.1 |
| GK-1 Letter Name Identification | 81 | 58.0 | 1659 | 47.9 | 2010 | 68.2 |

Notes. †AVANCE students in the current analysis include students dually enrolled in HISD and in the standalone program. D = “Developed”

To assess the kindergarten English reading skills of AVANCE students and the comparison groups, students’ results on the Screening Assessment, Phonological Awareness Inventory 1 (PA-1; *Rhyming*) and Graphophonemic Knowledge Inventory 6 (GK-1; *Letter Name Identification*) of the TPRI were compared. **Table 9** displays the percentage of students who scored developed according to the TPRI Screening Assessment. A slightly lower percentage of AVANCE students were identified as developed on the screening assessment (52.1 percent) compared to their peers who were not enrolled in HISD prekindergarten (55.2 percent) and students who had attended HISD prekindergarten the previous year (62.2 percent).

Because it is optional for students who score at the developed level on the screening section to take Inventories PA-1 and GK-1, the only students included in the analyses of these TPRI inventories were students identified by the screening section as “still developing.” The results of the TPRI inventories are also displayed in Table 9. On the TPRI Rhyming inventory, the AVANCE group had a higher percentage of “developed” students (28.4 percent) compared to their peers who had not been enrolled in an HISD prekindergarten program (25.6 percent) the previous year. The percent of AVANCE students who scored developed was lower than the percent that scored developed among students who had attended HISD prekindergarten (34.1 percent).

On the Letter Name Identification inventory, a greater percentage of students within the AVANCE group were identified as developed (58.0 percent) compared to the group of students who had not been enrolled in HISD prekindergarten the previous year (47.9 percent). However, the group with the highest

percentage of students scoring at the developed level was the group of students who had attended HISD prekindergarten, but who had not been enrolled in AVANCE (68.2 percent).

How did AVANCE dually enrolled students’ performance on the Tejas LEE compare to the performance of their peers enrolled in AVANCE’s standalone program?

Because the AVANCE group in the previous TPRI and Tejas LEE analyses included students who were dually enrolled in HISD prekindergarten and students enrolled in AVANCE’s standalone program, further analyses were conducted to determine whether performance differences existed between the AVANCE groups. **Table 10** displays the percentage of students enrolled in one of the two AVANCE programs identified as performing at the “desarrollado/developed” level and at “nivel esperado/expected” level on Inventory 1 (*Identificación de las letras/Letter Naming*) and Inventory 3 (*Conocimiento de rimas/Rhyming*) of the Tejas LEE. On both the Letter Naming and the Rhyming inventories, a similar percentage of AVANCE students dually enrolled in HISD were identified as performing at the “developed” level (49.3; 24.0 percent, respectively) compared to their counterparts who were enrolled in AVANCE’s standalone program (50.6; 20.8 percent, respectively).

How did the TPRI performance of students dually enrolled in AVANCE compare to the performance of their peers enrolled in the standalone program?

Table 10: Percent of Students Identified as Developed or Expected Performance Based on the 2012–2013 Beginning-of-Year Inventories of the Tejas LEE by AVANCE Groups

| | AVANCE HISD Dual | | | AVANCE Standalone | | |
|--------------------|------------------|------|------|-------------------|------|------|
| | n | %D | %NE | n | %D | %NE |
| INV1-Letter Naming | 75 | 49.3 | 44.0 | 77 | 50.6 | 33.8 |
| INV3-Rhyming | 75 | 24.0 | 76.0 | 77 | 20.8 | 79.2 |

Notes: D = “Developed” NE = “Expected Performance”

Table 11 displays the percentage of AVANCE students, aggregated by program type, who scored developed according to the TPRI Screening Assessment. Results indicate that a slightly greater percentage of AVANCE students who were dually enrolled in HISD scored at the developed level (53.2 percent) compared to the AVANCE student group enrolled in the standalone program (51.1 percent).

Again, 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 also displayed in Table 11. On the TPRI Rhyming inventory, a higher percentage of AVANCE students dually enrolled in HISD (35.1 percent) scored at the developed level compared to peers who were enrolled in the standalone program (22.7 percent). On the Letter Naming inventory, a slightly lower percentage of AVANCE students dually enrolled in HISD (56.8 percent) scored developed compared to the group of students who were enrolled in AVANCE’s standalone program (59.1 percent).

Discussion

The current evaluation examined the 2012–2013 kindergarten performance of the 2011–2012 AVANCE prekindergarten cohort. Similar to the performance comparisons of previous AVANCE cohorts, the current results suggest that AVANCE students are benefitting academically to some extent the year following the Head Start intervention. Support for this notion is provided by findings suggesting that on the Aprenda tests AVANCE students outperform their demographically similar peers who did not attend a formal ECE program the previous year. In addition, students who attended AVANCE are less likely to be classified as at-risk of having reading difficulties than their demographically similar peers who did not receive a formal ECE intervention through local Head Start agencies or HISD.

Furthermore, the benefits that students gain from attending AVANCE are comparable to the benefits of attending HISD prekindergarten given that the performance differences between these two groups were not found to be statistically significantly different

when accounting for age, gender, economic status, LEP classification, and special education status. However, it should be noted that in some assessments, HISD prekindergarten students outperformed AVANCE students. This may be partially explained by the fact that all HISD teachers are required to have certification and a four-year college degree whereas Head Start agencies do not necessarily have these same requirements.

Results from this evaluation also provide additional support that AVANCE students who were dually enrolled in HISD performed at higher levels on most indicators compared to AVANCE students enrolled in standalone sites. As mentioned in previous evaluations (Corkin, 2012), this may be explained by the fact that AVANCE students dually enrolled in HISD receive instruction and support from two instructors rather than one.

The current evaluation has several limitations that should be addressed. The first is that despite identifying comparison groups that were demographically similar, it is not definitively known whether students who did not attend HISD prekindergarten received some other form of early childhood intervention. Along these same lines, another limitation is that baseline demographic information was not available for the comparison group of students who did not attend HISD prekindergarten. The third limitation is that comparison groups were not matched by prior performance levels because students within each of these groups are not administered the same assessments in prekindergarten. Including prior performance levels may help explain some of the variance in kindergarten performance between groups. However, for next year’s evaluation this should no longer be a limitation given that the majority of students who attend prekindergarten will have their academic performance assessed through the Frog Street curriculum program assessments. Despite these limitations, similar to the performance results of the 2010–2011 AVANCE cohort, the current findings, for the most part, seem to corroborate previous research that has found short-term positive effects of Head Start (see Shager et al., 2013).

Future evaluations will examine how AVANCE

Table 11: Percentage of Students Identified as Developed at the Beginning-of-Year 2011–2012 Based on the Screening and Inventories of the TPRI by AVANCE Groups

| | AVANCE HISD Dual | | AVANCE Standalone | |
|---------------------------------|------------------|------|-------------------|------|
| | n | %D | n | %D |
| Screening Status | 79 | 53.2 | 90 | 51.1 |
| PA-1-Rhyming | 37 | 35.1 | 44 | 22.7 |
| GK-1 Letter Name Identification | 37 | 56.8 | 44 | 59.1 |

Note: D = “Developed”

students perform compared to other Houston-area Head Start programs. In addition, the first grade performance and retention of the 2010–2011 AVANCE student cohort (the second AVANCE cohort assessed) will be provided in a data report to AVANCE to continue AVANCE’s goal of monitoring the academic achievement of their students over a twelve-year period until graduation.

References

- Corkin, D.M., (2012). Longitudinal Data Study of AVANCE Students’ 2011–2012 Academic Performance in HISD: Year 1 Tracking of the 2010–2011 Prekindergarten Cohort. *Houston Independent School District Research and Accountability Reports*.
- Currie, J. (2001). Early childhood intervention programs: What do we know? *Journal of Economic Perspectives*, 15, 213-238.
- Ferguson, C. J. (2009). An effect size primer: A guide for clinicians and researchers. *Professional Psychology: Research and Practice*, 40, 532-538. doi: 10.1037/a0015808.
- Guo, S, & Fraser, M. W. (2010). *Propensity Score Analysis*. Thousand Oaks, California: SAGE..
- Nisbitt, R.E. (2009). Education is all in your mind. Retrieved April 19, 2011, from <http://www.nytimes.com/2009/02/08/opinion/08nibett.html>.
- Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observation studies for causal effects. *Biometrika*, 70, 41–55.
- Shager, H.M., Schindler, H.S., Magnuson, K.A., Duncan, G. J., Yoshikawa, H., Hart, C.M.D. (2013). Can research design explain variation in Head Start research results? A meta-analysis of cognitive and achievement outcomes. *Educational Evaluation and Policy Analysis*, 35, 76-95. doi: 10.3102/0162373712462453
- 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
SCHOOLS ATTENDED BY AVANCE STUDENTS
2011–2012

| Campus # | School Name |
|----------|-----------------------|
| 106 | Atherton |
| 109 | Berry |
| 113 | Paige, Roderick |
| 119 | Brookline |
| 120 | Browning |
| 122 | Burbank |
| 125 | Burrus |
| 128 | Lyons |
| 132 | Coop |
| 137 | Dechaumes |
| 157 | Garden Oaks |
| 170 | Helms |
| 181 | Janowski |
| 182 | Jefferson |
| 186 | Robinson |
| 188 | Kennedy |
| 197 | Looscan |
| 211 | Oak Forest |
| 231 | Roosevelt |
| 237 | Scarborough |
| 241 | Sinclair |
| 242 | Smith, K. |
| 245 | Stevens |
| 252 | Wainwright |
| 257 | Whidby |
| 279 | Tijerina |
| 283 | Garcia |
| 286 | Herrera |
| 289 | Martinez, C. |
| 298 | Martinez, R. |
| 350 | Energ for Excell ECA |
| 352 | Farias, Armandina ECC |
| 358 | Cook Jr., Felix |
| 389 | Ketelsen |
| 392 | Young Learners |

Note. Campus number identified in 2011–2012 PEIMS.

APPENDIX B
2012–2013 APRENDA AND STANFORD PERFORMANCE OF KINDERGARTENERS
BY AVANCE CENTERS

| Center/School | Aprenda Reading | | | Aprenda Math | | | Stanford Reading | | | Stanford Math | | |
|---------------|-----------------|----|-------|--------------|----|-------|------------------|----|-------|---------------|----|-------|
| | M (NCE) | n | SD | M (NCE) | n | SD | M (NCE) | n | SD | M (NCE) | n | SD |
| Browning | 66.01 | 35 | 21.16 | 75.97 | 35 | 19.07 | 47.01 | 24 | 14.99 | 49.60 | 24 | 21.18 |
| Golden Forest | 57.98 | 5 | 23.58 | 62.96 | 5 | 19.62 | -- | 4 | -- | -- | 4 | -- |
| Hardy | 69.57 | 6 | 25.09 | 74.92 | 6 | 16.82 | 48.18 | 18 | 22.18 | 48.92 | 18 | 22.32 |
| Jefferson | 60.81 | 16 | 12.38 | 75.49 | 16 | 20.21 | 59.24 | 26 | 16.43 | 57.42 | 26 | 17.87 |
| Jensen Drive | 62.51 | 49 | 23.86 | 70.08 | 49 | 25.20 | 43.36 | 31 | 20.00 | 43.74 | 31 | 21.11 |
| Ketelsen-Drew | 73.66 | 21 | 18.74 | 81.50 | 21 | 13.87 | 47.59 | 30 | 15.92 | 54.15 | 30 | 16.62 |
| Lincoln Park | -- | 0 | -- | -- | 0 | -- | -- | 2 | -- | -- | 2 | -- |
| Mangum HS | 61.83 | 12 | 29.63 | 63.24 | 12 | 25.72 | 52.67 | 21 | 22.92 | 46.11 | 21 | 22.26 |
| Mt. Houston | -- | 2 | -- | -- | 2 | -- | -- | 3 | -- | -- | 3 | -- |
| Oxford | -- | 2 | -- | -- | 2 | 26.16 | 47.05 | 8 | 10.63 | 50.05 | 8 | 14.79 |
| Tidwell | -- | 0 | -- | -- | 0 | -- | 49.16 | 5 | 16.81 | 38.84 | 5 | 22.66 |

Note. HISD schools highlighted in grey. "--" indicates less than 5 students.