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**Impact of the Child Development Program in
Charleston County School District:
A Longitudinal Report From
2002-03 to 2006-07**

**Brief No. 08-Brief042
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Each year, Charleston County School District (CCSD) reports on the substantial impacts of its Child Development (CD) program through analysis of student progress from fall to spring. The purpose of the current study is to examine the sustainability of these impacts through use of a longitudinal analysis that includes a comparison group of non-participants. The student achievement measures used in this study are scores from the English/Language Arts (ELA) and Math portions of the Palmetto Achievement Challenge Test (PACT), which is taken by students in grades 3 through 8. Students who entered the CD program during 2002-03 would generally take their first PACT test as third graders in the spring of 2007. Thus, this study compares third-grade PACT performance for students who were CD program participants during 2002-03 to a comparable group of students who had not participated in the CD program. In addition, this study analyzes student attendance across four years to examine whether the two groups differ in terms of attendance rates.

Relevant National and State-Level Research

Studies conducted nationally suggest that well-functioning CD programs improve the lives of their participants both in and out of school. A report by the High Scope Educational Research Foundation¹ provided results of a study that followed 128 high-risk children for over 40 years. The study concluded that for every dollar spent on high-quality preschool, taxpayers gain \$16.14. These gains accrue from more favorable outcomes in several areas, including a lower chance of repeating one or more grades, higher high school graduation rates, higher wages as adults, and fewer arrests.

A South Carolina-based research study² underscores the finding that young children at risk of academic failure can get an academic boost from participating in pre-kindergarten programs. The State Department of Education's Office of Research tracked a large group of CD program participants and a randomly-selected group of non-participating children with similar backgrounds through their fifth-grade year of school. Study results indicated that even through fifth grade, child development program participants scored significantly higher than non-participants on both PACT ELA and Math. In addition, the "achievement gap" that historically has occurred between racial groups was not significant for the CD participants, but was for the non-participants.

South Carolina ranks eighth nationally in terms of parental access to state-funded four-year-old programs according to a report released in 2006 by the National Institute for Early Education Research.³ On the other hand, South Carolina ranks 38th out of 38 state programs nationwide in terms of state funding for these programs.

¹ Schweinhart, L. J., Montie, J., Xiang, Z., Barnett, W. S., Belfield, C. R., & Nores, M. (2005). Lifetime effects: The High/Scope Perry Preschool study through age 40. (Monographs of the High/Scope Educational Research Foundation, 14). Ypsilanti, MI: High/Scope Press.

² Tenenbaum, I. M. (2004). What is the penny buying for South Carolina? Child development programs for four-year-olds: Longitudinal studies of later academic achievement, 1995-96 through 1999-2000 and 2000-01 through 2001-02, Evaluation Section, Office of Research: South Carolina Department of Education.

³ Barnett, W. S., Hustedt, J.T., Hawkinson, L.E., & Robin, K.B. (2006) The state of preschool 2006. The National Institute for Early Education Research.

Program Description

During 2002-03, the CD Program of CCSD served approximately 1,260 four-year-olds in 41 schools. These classes were funded through several different sources, including the following: EIA-Child Development, Title I, EIA funds, Charleston County First Steps Partnership Board, and local funds. The State Department of Education funded a maximum of 20 children per class with a certified early childhood education teacher and a qualified teacher assistant for a half-day session. At many sites, funds from multiple sources were combined, resulting in a mix of half-day and full-day programs at the 41 schools.

All parents who wished for their child to be considered for enrollment were allowed to pre-register their child at their local elementary school.⁴ All children who were pre-registered were then screened with a developmental instrument (DIAL-3)⁵ to determine eligibility for enrollment.

Research Questions

Can any measurable impacts from participation in the Child Development (CD) program be identified four years after participation?

- I. Did students who participated in the CD program during 2002-03 have higher 2007 PACT ELA and Math scores in grade 3 than students who had not participated in the CD program?
- II. Did students who participated in the CD program have higher attendance rates (across grades K-3) than students who had not participated in the CD program?

Matching Procedure

Of the 1,260 CD participants during 2002-03, a total of 711 students met the following two study conditions: (1) attended a CCSD school in third grade during 2006-07; and (2) completed the third-grade Palmetto Achievement Challenge Test (PACT) for ELA and Math in spring 2007. To establish two comparable groups for this study, CD participants were matched with students who enrolled in Kindergarten during 2003-04 and did not participate in the CD program during 2002-03. Matching variables included race, gender, free/reduced price lunch status, whether the student was an English Language Learner (ELL), and the school the student attended in Kindergarten.⁶ This matching process resulted in a sample of 219 students for each group. In order for a match to occur, both the CD and the non-CD students had to have third grade PACT ELA and Math test scores, attended CCSD schools for each grade (K-3rd), and never repeated a grade.

⁴ Children had to be four years of age on or before September 1, 2002 for entrance into the program.

⁵ DIAL-3 (Developmental Indicators for the Assessment of Learning – Third Edition) published by Pearson Assessments is an individually-administered screening device designed to identify young children with potential developmental delays who should seek further diagnostic assessment. This assessment is nationally normed and provides results that are specific to each child's exact age (year and month). The teacher-administered portion of the test is composed of three subtests: Motor, Concepts, and Language. A composite of these subtests is reported and used as one of the selection criteria for placement in the Child Development program.

⁶ A two-step matching process was used to create CD and non-CD groups that would be of sufficient size for analysis and as comparable to each other as possible. First, matches were made by pairing each student in the CD group with a third-grade student who had not participated in CD but who was of the same race, gender, lunch program participation status, English Language Learner status, and attended the same school for Kindergarten. Second, some of the matching criteria were relaxed in order to increase the sample size: matches were permitted across ethnic categories; the reduced lunch and the free lunch categories were combined; and the school variable (i.e., school where student attended Kindergarten) was collapsed into a variable identifying Title I versus non-Title I status.

Table 1 presents a demographic summary for the CD and the non-CD samples, each comprised of 219 students, as compared to the 711 CD students who took the third-grade PACT in spring 2007. Some small differences exist between the CD sample and the group from which the CD sample was formed. Students possessing demographic characteristics that occur less frequently were harder to find matches for and therefore, demographic characteristics occurring more frequently within the CD program are over-sampled (African-Americans, non-ELL students, and students attending Title I schools in Kindergarten). Additionally, of all 1,260 students attending CD in 2002-03, the initial DIAL-3 average normal curve equivalent (NCE)⁷ score was 39 compared to 38 for the 219 CD students chosen for this study. Therefore, the students chosen for this study are representative of the entire group of CD students in terms of initial performance on DIAL-3. Examination of Table 1 reveals that the CD and non-CD matched groups are very comparable in terms of each of the demographics included in the study. In fact, in no instance does the demographic composition of the two groups differ by more than one percentage point.

Table 1
Summary of Demographics by Group

	All 2002-03 CD Students* (N=711)	CD Sample (n=219)	Non-CD Matched Comparison (n=219)
<u><i>Ethnicity</i></u>			
African-American	71%	83%	84%
Caucasian	21%	13%	14%
Other	8%	4%	3%
<u><i>Gender</i></u>			
Female	50%	53%	53%
Male	50%	47%	47%
<u><i>Free/Reduced Price Lunch</i></u>			
Full Pay	24%	15%	15%
Free/Reduced	75%	85%	85%
<u><i>English Language Learner</i></u>			
No	94%	97%	97%
Yes	6%	3%	3%
<u><i>Title I Status of Kindergarten Attended in 2003-04</i></u>			
2003-04 Title I School	66.2%	79.9%	80.4%
2003-04 Non-Title I School	33.8%	20.1%	19.6%

* This includes only students with both PACT ELA and Math scores in third grade.

Note: Percentages may not add to 100% due to rounding.

⁷ NCEs have a mean of 50 and range from 1 to 99. The distribution of NCEs differ from that of percentile ranks: NCEs are uniformly distributed and rectangular in shape; percentile ranks are normally distributed and bell-shaped. Therefore, NCEs are on an equal-interval scale and percentile ranks are not. The major advantage of NCEs over percentile ranks is that NCEs can be manipulated mathematically (e.g., added and averaged).

Findings

I. Did students who participated in the CD program during 2002-03 have higher 2007 PACT (ELA, Math) scores in grade 3 than students who had not participated in the CD program?

- ⇒ As third graders in spring 2007, students who participated in the CD program during 2002-03 had mean scale scores of 312 on PACT ELA (corresponding to the performance level of “Proficient”) and 310 on PACT Math (corresponding to the performance level of “Basic”). Means of the CD students were equivalent to the means of all CCSD third graders (N=3,100), suggesting that as a group, the CD participants performed on par with other third graders. [See Table 2.]
- ⇒ The matched comparison group of students who did not participate in the CD program had third-grade mean scale scores of 306 on PACT ELA (corresponding to the performance level of “Basic”) and 304 on PACT Math (corresponding to the performance level of “Basic”). [See Table 2.]
- ⇒ Students participating in the CD program during 2002-03 outperformed ($p < .05$)⁸ the matched comparison group in both PACT ELA and Math third-grade scores.

Table 2
Third Grade 2007 PACT Average Scaled Scores

Group	N	ELA	Math
CD	219	312	310
Non-CD	219	306	304
<i>CCSD</i>	<i>3,100</i>	<i>312</i>	<i>310</i>

II. Did students who participated in the CD program have higher attendance rates (across grades K-3) than students who had not participated in the CD program?

- ⇒ CD participants and the matched comparison group of non-participants had equivalent mean attendance rates (averaged across K-3rd grade), 96%.

Conclusions

Students who were enrolled in a CD program in the 2002-03 school year had significantly higher PACT ELA and Math scores in their third grade year when compared to a matched group of students who had not participated in a CD program. This difference is noteworthy, especially considering that students chosen for CD participation are generally those who are most at risk for future academic failure. Thus, it may be that the current study underestimates the positive impact of CD participation. Additionally, students enrolled in a CD program had average PACT ELA and Math scores that equaled the average for all third-graders across CCSD. Analysis of attendance rates revealed no difference between CD students and non-CD students.

⁸ Statistical analysis was performed using independent sample t-tests.

Limitations of the Study

- ⇒ Because students could not be randomly assigned to treatment and control groups, alternative explanations for the positive results found here cannot be ruled out.
- ⇒ Because it is likely that the comparison group was associated with lower risk of future academic failure, the results may underestimate the impacts of the CD program.
- ⇒ Program implementation, instructional methods, and the quality of teachers' professional development activities are among the many variables that may moderate or contribute to study findings.

Recommendations for Further Study

- ⇒ Follow students beyond third grade to determine the CD program's lasting impact on student achievement.
- ⇒ Explore effects of participation in CD programs on student socialization skills (e.g., number of discipline referrals)
- ⇒ Look at how CD participation affects the performance/socialization skills of students identified with learning and/or emotional disabilities.
- ⇒ Examine the relationship between CD impacts and K-3 teacher experience and education level.
- ⇒ Estimate the impact of CD participation on retention rates of students.

Assessment & Accountability: Report User Feedback for 2007 – 2008

Title of Report: Impact of the Child Development Program in Charleston County School District: A Longitudinal Report From 2002-03 to 2006-07

Person(s) Preparing Report: Tia Sukin & Laura Donnelly, Ph.D.

Date of Report: January 2008

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