



# Early Learning: Return on Investment

## Annotated Bibliography

Today's researchers seek to determine if contemporary pre-K programs provide the strong return on investment found by researchers in the 1960's High/Scope Perry Preschool Program and 1970's North Carolina Abecedarian Project. Research then showed that these two programs created positive academic effects that accompanied their students as they moved through school. Policy-makers now look to current research for guidance in making informed decisions. New evidence from large-scale early learning programs in Chicago, New Jersey and Texas, as well as from federally funded Head Start, is positive. The findings in these studies identify specific elements in these pre-K programs that are the most beneficial. And, evidence from state programs in Arkansas, Georgia, Michigan, North Carolina, Oklahoma, Tennessee and West Virginia is also instructive.

The following studies provide a sampling of research on policy topics with nationwide applicability.

### Cost-benefit and effect size analyses of pre-K programs

1. **Reynolds, A. J., Temple, J., White, B., Ou, S., & Robertson, D. (2011). Age 26 Cost-Benefit Analysis of the Child-Parent Center Early Education Program. *Child Development* (82.1), 379-404.**

This study provides a cost-benefit analysis of the Chicago Child-Parent Centers (CPC). It follows former prekindergarten students through age 26. This Title I-funded program features an educational component and comprehensive family services in high-poverty Chicago neighborhoods. After Head Start, CPC, established in 1967, is the nation's oldest ongoing federally funded early learning intervention. The program costs about \$8,500 per child per year. CPC also serves a limited number of school-age (K-2) classrooms, which are vertically aligned with the CPC pre-K curriculum and have smaller class sizes, fewer teacher aides, extra instructional materials and family supports. The overall return on investment of the pre-K program is \$10.83 per dollar invested. The primary benefits of the programs include increased earnings for the individual and increased tax revenues and averted criminal justice costs. The study found that program participants' reading and math advantages persisted through grade 9. These individuals had lower rates of school-grade retention and special education placement, higher rates of high school completion and more total years of education. They had lower rates of child maltreatment, out-of-home placement, and juvenile arrest as children and young adults. As adults, they had significantly lower rates of felony arrest, depression, substance abuse and daily smoking; they had higher rates of health insurance coverage.

2. **Reynolds, A.J. & Temple, J. (2008). Cost-Effective Early Childhood Development Programs from Preschool to Third Grade. *Annual Review of Clinical Psychology* (4), 109-139.**

This study is an earlier follow-up cost-benefit analysis of the Chicago Child-Parent Centers (CPC) following the participants through age 22. It includes a robust discussion of the CPC program and compares the CPC in economic and programmatic detail to other well-known programs like High/Scope Perry Preschool, Head Start and the North Carolina Abecedarian Project.

3. **Barnett, W.S. (2013). *Expanding Access to Quality Pre-K is Sound Public Policy*. National Institute for Early Education Research. Available online at [www.nieer.org](http://www.nieer.org)**

This study evaluates the budgetary impact in each of the 50 states if they were to fully implement large-scale public pre-K programs that met all 10 of the National Institute for Early Education Research's (NIEER) well-known standards of pre-K quality. The model assumes temporary federal matching funds and eventual state assumption of full financial responsibility for pre-K. The model finds that by 2030, in 49 of 50 states, full implementation of high-quality, state-funded public full-day pre-K, serving all children under 200 percent of

the federal poverty level, would result in an overall reduction in states' education expenditures by reaping cost savings in retention and special education. In Florida and Texas, the model projects a savings of more than a million dollars in each state. (The model did not indicate a savings for Idaho.)

## Catch up vs. fade out: Do pre-K's positive effects persist through K-12?

4. **United States Department of Health and Human Services. (2010, January). *Head Start Impact Study: Final Report*. Washington, D.C.: Administration for Children and Families, Office of Planning, Research and Evaluation. Available online at [www.acf.hhs.gov](http://www.acf.hhs.gov)**

The Head Start Impact Study evaluated a 2004 cohort of students and found strong immediate gains in language and literacy for pre-K students compared to non-pre-K students as they entered kindergarten and first grade. But, they found that the gains faded by the end of first grade. Since the 2004 cohort and this study of it, significant programmatic changes to Head Start, notably in the areas of curriculum and teacher qualifications have occurred. (See study below.)

5. **Aikens, N., Kopack Klein, A., Tarullo, L., & West, J. (2013, June). *Getting Ready for Kindergarten: Children's Progress During Head Start. FACES 2009 Report. OPRE Report 2013-21a*. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services. Available online at [www.acf.hhs.gov](http://www.acf.hhs.gov)**

The Head Start FACES study followed the 2009 cohort of Head Start students to unravel questions raised in the Head Start Impact Study (see study cited above) about why early cognitive impacts did not persist past first grade. The FACES study was the first study of Head Start since revisions of the curriculum and teacher qualifications requirements for the program. Researchers have revealed that the results of the earlier Impact studies were confounded based on how students were classified as pre-K or not. Students were considered pre-K if they were assigned to the program, not by whether they participated in it. Many students not assigned to pre-K participated in other early learning programs, including Head Start. The study design therefore did not allow for measuring the impacts of the program itself. (For ethical reasons, the researchers could not prevent children not assigned to Head Start in the control group from attending Head Start if there were no other options in their community. Likewise, they could not compel children assigned to Head Start to attend.) The study also did not control for the compensatory effects of students' K-3 experiences, which could lead to control-group children making significant gains of their own and catching up to their peers. The result is that the apparent academic advantage of students assigned to Head Start seems to converge with the scores of control-group students. Therefore, it is false to characterize this convergence of academic progress as a fade out of the positive effects. In contrast to the findings of the Head Start Impact Study, the FACES study found larger, more enduring academic gains as a result of Head Start participation.

6. **Barnett, W.S. (2011). *Preschool Education as an Educational Reform: Issues of Effectiveness and Access*. National Institute for Early Education Research. Available online at [www.nieer.org](http://www.nieer.org)**

This analysis of multiple studies (meta-analysis) traces 25 years of research on pre-K. Its focus is on research that studied the effects of quality programs on learning and development of young children. These studies show that pre-K programs produce an immediate academic effect that is the equivalent of moving a child from the 30th percentile to the 50th percentile. Results also show this effect declines over time but does not go away. Initial effects level off through the school years at about half the size of the initial effect. Long-term outcomes include lasting effects on cognitive abilities, school progress (grade retention, special education placement and high school graduation) and social behavior. The decline in effect is not properly considered "fade-out." Schools can help children who did not attend pre-K to catch up with those who did and bring them all to the same standards. Such "catch-up" efforts are expensive; cost analysis studies have shown that far less was spent on grade repetition and special education services for children who attended pre-K than for those who did not.

7. **Barnett, W.S., Jung, K., Youn, M.J., & Frede, E.C. (2013). *Abbott Preschool Program Longitudinal Effects Study: Fifth Grade Follow-Up*. National Institute for Early Education Research. Available online at [www.nieer.org](http://www.nieer.org)**

This longitudinal study followed children who, as 4-year-olds, attended New Jersey's Abbott Preschool Program through the end of fifth grade. It follows an earlier study of these children once they completed second grade. The 2013 study was to test for persistence of academic gains for students who attended the pre-K program. The study found that, by grade 5, pre-K students had large, persistent advantages over their non-pre-K peers in language/literacy, math and science. Two years of pre-K attendance were more advantageous than one year for academic gains. The researchers concluded that "by fifth grade, the achievement advantage from attending two years of Abbott pre-K...equals about three-quarters of a year of growth in math and two-thirds of a year of growth in language arts." Also, the study concluded that students who attended Abbott pre-K had lower rates of grade retention (by 40 percent) and special education placement (by 31 percent). These reductions were deemed significant enough to offset the overall cost of the pre-K program substantially.

8. **Camilli, G., Vargas, S., Ryan, S., & Barnett, W.S. (2010). *Meta-Analysis of the Effects of Early Education Interventions on Cognitive and Social Development*. *Teachers College Record* (112.3), 579-620.**

Following over 50 years of research, this meta-analysis of 123 key studies on preschool programs found significant benefits from preschool participation. Most substantially, preschool attendance positively impacts the cognitive development of children. Additionally, the researchers found that preschool provides positive long-term outcomes on program participants' social skills and school progress, including lower instances of grade-level retention and special education. Programs that include teacher-directed instruction and small groups were found to intensify these gains in early development. Additional intervention services administered before kindergarten also were found to promote program participants' social skills and school progress, however these services negatively correlated with cognitive gains. The meta-analysis found that participants who used these extra services typically received less direct instruction, suggesting that the delivery of these additional services often detracts from the instructional hours of the preschool day.

9. **Andrews, R.J., Jargowsky, P., & Kuhne, K. (2012). *The Effects of Texas's Targeted Pre-Kindergarten Program on Academic Performance*. National Center for Analysis of Longitudinal Data in Education Research, Working Paper 84. Available online at [www.nber.org](http://www.nber.org)**

This study assesses the extent to which Texas' large-scale public prekindergarten program affects scores on achievement tests, the likelihood of being retained in grade, and the probability that a student receives special education services. It finds that having participated in Texas' targeted pre-K program is associated with increased scores on the math and reading sections of the Texas Assessment of Academic Skills (TAAS), reductions in the likelihood of being retained in grade, and reductions in the probability of receiving special education services. It also finds that participation in pre-K increases math scores for students who take the Spanish version of the TAAS tests. The results show that even modest, public pre-K programs implemented at scale can have important effects on students' educational achievement.

## Evaluations of pre-K programs in SREB states

### Arkansas

Jung, K., Barnett, W.S., Hustedt, J., & Francis, J. (2013). *Longitudinal Effects of the Arkansas Better Chance Program: Findings from First Grade through Fourth Grade*. National Institute for Early Education Research. Available online at [www.nieer.org](http://www.nieer.org)

This study of the Arkansas Better Chance (ABC) program traced the long-term outcomes of the state-funded program on children's level of school readiness and cognitive development through fourth grade. It found persistent educational gains for program participants, including positive effects on children's vocabulary and

math skills through second grade and on early literacy through third grade. Likewise, participants in the ABC Program had lower levels of grade retention through third grade.

### **Georgia**

Fitzpatrick, M.D. (2008). Starting School at Four: The Effect of Universal Pre-Kindergarten on Children's Academic Achievement. *The BE Journal of Economic Analysis and Policy* (8.1), Article 46.

Using data from the National Assessment of Educational Progress (NAEP), this evaluation of the Georgia Pre-K Program estimates the impact of universal pre-K on children's long-term educational achievement. The author found that the availability of the state program in rural and small towns increases NAEP math and reading performance and the probability of being on grade level for local economically disadvantaged fourth graders. Other student groups also benefited from program availability, but not in such a uniform manner, suggesting that universal pre-K programs more strongly benefit certain at-risk populations.

### **North Carolina**

Peisner-Feinberg, E.S., & Schaaf, J. (2010). *Long-Term Effects of the North Carolina More at Four Pre-Kindergarten Program: Children's Reading and Math Skills at Third Grade*. Frank Porter Graham Child Development Institute, University of North Carolina.

Findings from this evaluation of the North Carolina More at Four Pre-K Program suggest that participation in this program can reduce math and reading achievement gaps between disadvantaged children and their peers. The authors found that program participants who qualified for free or reduced-price lunches scored higher in math and reading on the third grade end-of-grade assessments than their similarly disadvantaged peers who did not attend More at Four, indicating that pre-K yields positive effects on student performance.

### **Oklahoma**

Gormley, W.T., Gayer, T., Phillips, D., & Dawson, B. (2005). The Effects of Universal Pre-K on Cognitive Development. *Developmental Psychology* (41.6), 872-884.

This evaluation of the universal Oklahoma Early Childhood Four-Year-Old Program found the program positively affected children from diverse backgrounds, extending program benefits to black, Hispanic, Native American, and white children, as well as children eligible for free or reduced-price lunch. Participation in the state-funded program correlates with higher scores on an assessment of letter-word recognition, spelling, and early math skills. Overall, children exposed to the program experience a seven- to eight-month gain in letter-word recognition, a six- to seven-month gain in spelling, and a four-month gain in math skills when compared to nonparticipants.

### **Tennessee**

Lipsey, M.W., Farran, D., Hofer, K., Bilbrey, C., & Dong, N. (2013). *Evaluation of the Tennessee Voluntary Prekindergarten Program: Kindergarten and First Grade Follow-Up Results from the Randomized Control Design*. Peabody Research Institute, Vanderbilt University.

This follow-up evaluation of the Tennessee Voluntary Prekindergarten Program builds on an earlier finding that program participation results in substantial achievement gains at the end of the preschool year. In this study, the researchers found that these achievement gains from preschool faded when measured at the end of kindergarten and first grade. However, the follow-up evaluation found long-term social benefits such as higher school attendance rates and lower kindergarten retention rates for program participants.

### **West Virginia**

Lamy, C., Barnett, W.S., & Jung, K. (2005). *The Effects of West Virginia's Early Education Program on Young Children's School Readiness*. National Institute of Early Education Research. Available online at [www.nieer.org](http://www.nieer.org)

This study assesses the cognitive impact of West Virginia's Early Education Program on school readiness. It found the state-funded program positively affects early literacy and math skills. Entering kindergarteners who attended the program achieved higher scores on kindergarten-entry assessments of early math skills, letter recognition and letter-sound associations than kindergarteners who did not attend. Program participants gained an additional three months of vocabulary development over nonparticipants.

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