



## Selected Research Summaries

### Pennsylvania Studies:

#### **Invest Now or Pay More Later: Early Childhood Education Promises Savings to Pennsylvania School Districts.**

Pennsylvania Build Initiative. 2006.

[http://www.able.state.pa.us/early\\_childhood/lib/early\\_childhood/BUILD\\_Report\\_III.Harvey.Feb061.pdf](http://www.able.state.pa.us/early_childhood/lib/early_childhood/BUILD_Report_III.Harvey.Feb061.pdf)

This publication, based upon a variety of national studies and studies in other states (especially Ohio) as well as preliminary data on pre-K investments in Pennsylvania, concludes that school districts in the Commonwealth will benefit from such investments, as will their communities and the state as a whole. Specifically:

1. Children from high quality preschool programs do better in school from kindergarten through grade 12. They outperform non-pre-school children on achievement tests throughout school and into adulthood.
2. Preliminary estimates indicate that Pennsylvania taxpayers will get back about \$1.68 for every dollar invested in preschool programs (counting educational savings, increased earnings of school graduates, and savings on public assistance and corrections).
3. Analysis of eight school districts in Pennsylvania indicates that districts will recoup about 78 cents of every dollar spent on preschool education. Some districts with high special education expenditures will receive as much as \$1.16 for every dollar invested. Non-school returns in the form of improved tax revenues and savings on public assistance and corrections can also be anticipated.

#### **Quality Early Learning – Key to School Success: A First-Phase 3-Year Program Evaluation Research Report for Pittsburgh’s Early Childhood Initiative (ECI).**

Bagnato, S.J., Smith-Jones, J., McClomb, G., & Cook-Kilroy, J. The UCLID Center at the University of Pittsburgh. October 2002.

[http://www.uclid.org:8080/uclid/pdfs/ecp\\_final\\_report.pdf](http://www.uclid.org:8080/uclid/pdfs/ecp_final_report.pdf)

The UCLID Center at the University of Pittsburgh evaluated the Allegheny County Early Childhood Initiative (ECI), a high-quality pre-K program operated by community partnerships in eight low-income neighborhoods in and around Pittsburgh beginning in 1997. The program targeted at-risk children, and 86% of participants were classified as being at-risk.

Results after three years are summarized below:

1. Over 85% of ECI children entered kindergarten without education support services, and 98% were promoted from kindergarten to first grade.
2. Only 1% of ECI students were referred for special education services, compared with 21% of non-ECI children in the same school districts.
3. Only 2% of ECI children were retained in grade once they entered school, compared with 23% of non-ECI children in the same districts.
4. After 3 years of participation in ECI, children demonstrated increased social skills, self-control behaviors, and significant decreases in problem behaviors.
5. Parents of ECI children were more involved in enrichment activities, the use of appropriate toys, and more effective discipline strategies.

## **Return on Investment Studies:**

### **The Cost and Benefits of Universal Preschool in California.**

The RAND Corporation, 2005.

[http://www.rand.org/pubs/research\\_briefs/RB9118/RAND\\_RB9118.pdf](http://www.rand.org/pubs/research_briefs/RB9118/RAND_RB9118.pdf)

The RAND Corporation was asked to estimate costs and benefits of implementing universal pre-K in California. In estimating costs and benefits, the RAND researchers assumed a high level of program quality, meaning that the universal pre-K program would meet nationally recognized standards for class sizes, staff ratios, staff qualifications, and other features associated with better outcomes for children. They also assumed a part-day, voluntary program that would enroll 70 percent of the state's 4-year-olds. Benefits of universal pre-K were based on scientific evidence of the effects of high-quality programs on disadvantaged children. These effects include reduced remedial education services and increased educational attainment by program participants, reduced abuse and neglect of participants, reduced victimization by crimes committed by participants, increased wage and salary compensation of participants, increased taxes realized by government, and reduced need for child care for participants. Other likely benefits of pre-K participation were not included because of data limitations. Adjustments were made for lower-risk children and for children already enrolled in preschool under the existing system who would likely realize fewer benefits under a universal system. All future benefits and costs were discounted to present values at 3 percent per year. Major findings are summarized below:

1. Universal pre-K would generate about \$11,400 in present value benefits per child for California society (public and private sectors), compared to \$4,300 in additional present value costs, for a net benefit of over \$7,000. That equals a return of \$2.62 for every dollar invested, or an annual rate of return of about 10 percent over a 60-year horizon.
2. When a range of assumptions from more to less conservative is considered, the gain per dollar invested ranges from \$2 to more than \$4.
3. Each annual cohort of California children served would generate \$2.7 billion in net present value benefits for California society.
4. Benefits to society are likely understated because there are not enough data to include some potential benefits. The best available estimates of intangible victim costs alone would increase universal pre-K's net present value by nearly 50 percent.
5. The benefit-cost analysis does not incorporate some further economic and non-economic benefits including near-term labor force benefits for California businesses in terms of increased labor force recruitment, participation rates, and workforce

performance, and longer-term benefits for the state in terms of increased economic growth and competitiveness, along with greater economic and social equality.

6. Net benefits are negative for state and local governments, which are assumed to bear the full costs of the program. However, investments in public education are justified not necessarily because they generate a positive return for the state and local government sector but because they generate positive net benefits to society as a whole. In addition, savings to government are likely underestimated, because some sources of future government savings are not accounted for, including savings related to reduced use of social welfare benefits.

## **Early Childhood Development: Economic Development with a High Public Return**

Rolnick, A. and Grunewald, R., Federal Reserve Bank of Minneapolis. March 2003.

<http://www.mpls.frb.org/pubs/fedgaz/03-03/earlychild.cfm?js=0>

The two Federal Reserve economists have analyzed the return on investment of high-quality pre-K programs such as the Perry Preschool program in Michigan and contend that such programs provide a greater societal return than many alternative economic development initiatives states employ.

1. Based on present value estimates, about 80% of the benefits of early care and education go to the general public, yielding more than 12% in internal rate of return for society in general.
2. At a 12% return, the value created in 30 years from this investment is \$124,776 in today's dollars, based upon the relatively high cost per student of the Perry program.
3. This means that early care and education is a far better investment than sports stadiums, industrial parks, and inducements to high-profile companies.

## **The Economic Benefits of High-Quality Early Childhood Programs: What Makes the Difference**

Galinsky, E., Committee for Economic Development. 2006.

[http://sitemaker.umich.edu/carss\\_education/files/ced\\_economic\\_benefits.pdf](http://sitemaker.umich.edu/carss_education/files/ced_economic_benefits.pdf)

Three major pre-k programs – the Abecedarian, Chicago Parent-Child, and Perry Preschool projects – were reviewed to determine long-term cost-benefit impacts. The author summarized seven main components that led to these programs; success:

1. The programs began early.
2. Teachers were well educated and well compensated which resulted in low staff turnover.
3. Programs had small class sizes and high teacher-child ratios.
4. The programs were intensive and long term.
5. Two of the three programs systematically transitioned students into the early elementary school years.
6. Two of the three programs provided parent education and/or support.
7. The programs focused on children's development and learning.

In 2002 dollars, the Perry Preschool project graduates (at age 27) provided \$8.74 in benefits for each \$1 invested; the Abecedarian project graduates (age 22) provided \$3.78 for every \$1 invested; and the Chicago Child-Parent Center graduates (age 21) provided \$10.15 for every \$1 invested. Components leading to the success of these programs include:

1. Clear goals with support for accomplishing the goals.
2. Teacher-child relationships that are central to learning.
3. Interventions focused on the whole child.
4. Curriculum as a framework for learning.
5. Highly skilled and compensated teachers who continually find ways to improve their teaching practice to accomplish program goals.

## **The Economic Promise of Investing in High-Quality Preschool: Using Early Education to Improve Economic Growth and the Fiscal Sustainability of States and the Nation.**

Committee for Economic Development. 2006.

[http://www.ced.org/docs/report/report\\_prek\\_econpromise.pdf](http://www.ced.org/docs/report/report_prek_econpromise.pdf)

This report reviews the costs and benefits of quality pre-K and reviews state trends. The authors note that money invested now will not only help children develop social, emotional, and academic foundations that will lead to personal success, but that the economy also will benefit from a better prepared workforce, increased employment opportunities, rising standards of living, lower crime, etc. Extending pre-K benefits to all students could yield \$2 to \$4 in net present-value benefits for every dollar invested. Pre-K investments for just one age cohort of students could generate \$150 billion in net present-value benefits to the U.S.

Pre-K programs can lead to states recouping 50 to 85 cents in reduced crime and 36-77 cents in school savings. In addition, they also increase revenue tax revenue when parents are able to work. It is estimated that increased tax revenues will pay for 20 to 50 percent of a state's cost to expand pre-K to all students. Providing pre-K for all students does not necessarily mean equal services for all; economically disadvantaged students may need more or earlier high-quality pre-K than children who are not faced with similar disadvantages. Quality is key to success. This includes attracting and retaining well qualified teachers, providing low child/teacher ratios and age appropriate curriculum, and attending to social, academic, emotional, and physical child development. Early education must be combined with high quality K-16 programs. Simply shifting k-16 dollars to preschool is not productive.

## **Invest in the Very Young.**

Heckman, J. 2002.

<http://www.ounceofprevention.org/downloads/publications/Heckman.pdf>

James Heckman, the 2000 Nobel Laureate in Economic Sciences, has studied the economic return on investments in early education programs and concluded that "learning . . . is most effective when it begins at a young age and continues through adulthood. The returns to human capital investments are greatest for the young."

## **Many Happy Returns: Three Economic Models that Make the Case for School Readiness.**

Bruner, C., State Early Childhood Policy Technical Assistance Network. December 2004.

[http://www.finebynine.org/pdf/SECPTAN\\_MHR\\_final.pdf](http://www.finebynine.org/pdf/SECPTAN_MHR_final.pdf)

This study summarizes previous return on investment (ROI) studies of four high-quality preschool programs – the Chicago Parent-Child Centers, the Perry Preschool Program, the Elmira Prenatal/Early Infancy Program (PEIP), and the Abecedarian Project. The study reviewed returns related to child growth and development, economic effects, and adult human capital development. Returns for all four represent significant multiples of investments in the programs:

1. The Chicago program cost \$7,428 per child for a 1 ½ year program and returned \$52,711 in benefits for a ROI of \$7.10 per \$1 spent.
2. The Perry program in Michigan cost \$15,895 per child for a one year program and returned \$138,486 in benefits for a ROI of \$8.74 per \$1 spent.
3. The Elmira project cost \$7,109 for a period from prenatal care to age 2 and returned \$49,217 in benefits for a ROI of \$6.92 per \$1 spent.
4. The Abecedarian project cost \$35,864 in total program costs per child and returned \$143,674 in benefits for a ROI of \$4.01 per \$1 spent.

## **Pre-K Effects Studies:**

### **From Neurons to Neighborhoods: The Science of Early Childhood Development**

National Research Council. 2000.

<http://www.nap.edu/books/0309069882/html/>

This is the single largest and most scientifically definitive description of human brain development. Among its conclusions:

1. The first few years of life are most vital for learning as they correspond with the developing architecture of the human brain.
2. Children who have high-quality preschool experiences have fewer grade retentions, less remediation, higher standardized test scores, and higher graduation rates than those without such experiences.

### **Early Learning, Later Success: The Abecedarian Project.**

Frank Porter Graham Center, University of North Carolina, 1999.

<http://www.fpg.unc.edu/~abc/summary.cfm>

This study summarizes the results at age 21 of former participants in the intensive high-quality Abecedarian preschool program in North Carolina.

1. Young adults who received early educational intervention had significantly higher IQ scores. Averaged over the age span tested, the mental test score effect size for treatment was moderate and considered educationally meaningful.
2. Reading achievement scores were consistently higher for individuals with early intervention. Treatment effect sizes remained large from primary school through age 21.
3. Mathematics achievement showed a pattern similar to that for reading, with treated individuals earning higher scores. Effect sizes were medium in contrast to the large effects for reading.
4. Among program participants, 40% were in school at age 21 compared with 20% of the control group.

5. A significant difference was also found for the percent of young adults who ever attended a four-year college. About 35% of the young adults in the intervention group had either graduated from or were at the time of the assessment attending a four-year college or university, compared with about 14% in the control group.
6. Young adults in the intervention group were, on average, two years older (19 years) when their first child was born compared with those in the control group (17 years).
7. Employment rates were higher (65%) for the treatment group than for the control group (50%), although the trend was not statistically significant.

## **The Effects of State Prekindergarten Programs on Young Children's School Readiness in Five States.**

Barnett, W.S., Lamy, C., Jung, K., The National Institute for Early Education Research, Rutgers University. December 2005.

<http://nieer.org/resources/research/multistate/fullreport.pdf>

This study examined the effects of state funded pre-K programs in five states – Michigan, New Jersey, Oklahoma, South Carolina, and West Virginia. Overall findings show that state-funded preschool does have positive impacts on children including:

1. State-funded preschool produces an increase in children's vocabulary scores of nearly 4 raw score points, which equals 31% more growth over the year and an 8 percent increase in children's average vocabulary scores. This improvement translates into an additional four months of progress in vocabulary growth due to the preschool program. This outcome is particularly important because the measure is strongly predictive of general cognitive abilities.
2. Children who attended state-funded preschool scored higher on a test of early math skills. State-funded preschool increased children's math scores by almost 1 ½ raw score points, 44% more growth in a year due to the program and a 13 percent increase in children's average math scores. Skills tested include basic number concepts, simple addition and subtraction, telling time, and counting money.
3. State-funded preschool had strong effects on children's understanding of print concepts. The program increased all children's print awareness scores by nearly 17 percentage points, which is 85% more growth over the year and a 39% increase in children's print awareness scores. Children who attended a state-funded preschool program before entering kindergarten know more letters, more letter-sound associations, and are more familiar with words and book concepts.
4. There were no significant effects on children's phonological awareness. Children in this study appeared to perform well on this test, with or without the preschool program.

Detailed reports on each of the states also were published:

## **The Effects of the Michigan School Readiness Program (MSRP) on Young Children's Abilities at Kindergarten Entry.**

Lamy, C., Barnett, W.S., Jung, K., The National Institute for Early Education Research, Rutgers University. December 2005.

<http://nieer.org/resources/research/multistate/mi.pdf>

### **The Effects of New Jersey's Abbott Preschool Program on Young Children's School Readiness. 2005.**

Lamy, C., Barnett, W.S., Jung, K., The National Institute for Early Education Research, Rutgers University. December 2005.

<http://nieer.org/resources/research/multistate/nj.pdf>

### **The Effects of Oklahoma's Early Childhood Four-Year-Old Program on Young Children's School Readiness.**

Lamy, C., Barnett, W.S., Jung, K., The National Institute for Early Education Research, Rutgers University. December 2005.

<http://nieer.org/resources/research/multistate/ok.pdf>

### **The Effects of the South Carolina's Child Development Programs on Youth Children's School Readiness.**

Lamy, C., Barnett, W.S., Jung, K., The National Institute for Early Education Research, Rutgers University. December 2005.

<http://nieer.org/resources/research/multistate/sc.pdf>

### **The Effects of West Virginia's Early Education Program on Young Children's School Readiness.**

Lamy, C., Barnett, W.S., June, K., The National Institute for Early Education Research Rutgers University. December 2005.

<http://nieer.org/resources/research/multistate/wv.pdf>

### **The Georgia Early Childhood Study 2001-2004, Final Report.**

Henry, G.T., Rickman, D.K., Ponder, B.D., Henderson, L.W., Mashburn, A., and Gordon, C.S. Georgia State University (Andrew Young School of Policy Studies). 2005.

<http://aysps.gsu.edu/publications/2005/EarlyChildhoodReport.pdf>

Georgia was the first state to offer early education to all its four-year-olds. The Georgia Early Childhood Study was designed to measure skills and behaviors that indicate whether children are prepared for success in school (language and communication skills, cognitive development, health and physical well-being, social behaviors, and attitudes toward school and learning).

A summary of results follows:

1. Significant gains in skill levels were made when compared with national samples of similar aged children. As preschoolers, Georgia's students began significantly behind others. By the end of first grade they exceeded national norms in math, phonemic awareness, expressive language, and letter and word recognition.
2. In terms of receptive language skills (PPVT), Georgia's early elementary students in the study posted substantial increases relative to national norms. These students began

preschool with a mean score of 92.9, well below the national norm (100). By the end of first grade, on average, the students had a mean score of 98.0.

3. Georgia's preschoolers were able to recognize more letters and words when they began preschool (102.7) than the national norm (100), and their scores increased by the end of first grade to 111.1.
4. Georgia's preschoolers lagged significantly behind the national norm (100) in their expressive language skills at the beginning of the study (90.7). However, each year they were able to gain on the national norm, and by the end of first grade had come close to matching it (98.8).
5. Students also posted significant gains against the national norm for children of their age on their problem-solving skills over the study period. Preschool students began that year behind (96.9) the national norm (100). However, they had met the norm by the beginning of kindergarten and well exceeded it by the end of first grade (109.3).
6. Children from economically disadvantaged households and minority children began to close the skill gap in their earliest years of schooling that has been associated with retention, dropout rates, and the achievement gap in later years.

### **Lifetime Effects: The High/Scope Perry Preschool Study Through Age 40**

Schweinhart, L.J., Monie, J., Xiang, Z., Barnett, W.S., Belfield, C.R., Nores, M. 2005.

[http://www.highscope.org/Research/PerryProject/PerryAge40\\_SumWeb.pdf](http://www.highscope.org/Research/PerryProject/PerryAge40_SumWeb.pdf)

This is a follow-up study of low-income 3- and 4-year-olds who participated in a two-year high-quality pre-K program in Ypsilanti, Michigan. Program graduates were 40 years old at the time of this study. Perry was a comprehensive program involving education, health, and family support components at a cost of \$14,400 per child for two years. Major findings include the following:

1. Program participants graduated from high school at higher rates (65%) than the control group (45%). This was most marked for females (84% vs. 32%).
2. Participants outscored the control group on intellectual and language tests in their early years, on school achievement tests between ages 9 and 14, and on literacy tests at ages 19 and 27.
3. Participants were more likely to be employed at age 40 and had higher median annual earnings.
4. At age 40, those who participated were more likely to have savings accounts and to own their own homes than those in the control group.
5. Participants were much less likely to have been arrested than those in the control group.
6. The return to society by age 40 exceeded \$17 for every \$1 spent on the pre-K program.

### **Long Term Effects of an Early Childhood Intervention on Educational Achievement and Juvenile Arrest. A 15 Year Follow-up of Low Income Children in Public Schools.**

Reynolds, A.J., Temple, J.A., Robertson, D.L., and Mann, E. A... Journal of the American Medical Association. Col 285, No. 18. May 9, 2001.

<http://jama.ama-assn.org/cgi/content/abstract/285/18/2339>

This is a 15-year follow-up on the Chicago Child-Parent Center. The CPC program consisted of multiple services provided to a group of low-income, mostly African-American children born in

1980 and enrolled in the program at 15 sites in Chicago. This is one of the most comprehensive long-term studies of and early intervention program on education and crime.

1. Children who participated in the preschool intervention for one or two years had higher rates of high school completion, lower rates of school dropouts, and more years of completed education.
2. They had lower rates of juvenile arrests and violent crime arrests.
3. Participation in both the preschool and school age program resulted in lower grade retention and special education services.