

***Early Childhood Research Digest #1***

**Is Pre-K a Good Investment?  
What We Know from Cost-benefit Analyses of Early Care and Education**

**Maureen Ittig  
Diane Adams  
David Edie  
David Riley  
Mary Roach**

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## Summary

Two key points guide discussion of the potential benefits of pre-kindergarten initiatives.

1. The Perry Preschool, Chicago Child-Parent Center, and Abecedarian projects are large well-funded, longitudinal research programs that focused directly on developmental outcomes of impoverished, primarily African-American, children and included detailed cost-benefit analyses of early care and education for children, families, and society in general. These programs indicate significant short and long-term effects of early childhood intervention.
2. At least 33 state-funded preschool programs have been instituted (Gilliam & Zigler, 2001). Of these, only 13 included any evaluation component. In general, the results of these non-experimental evaluations indicate positive short-term effects on various aspects of child development (cognitive, language, social, emotional) through first grade. No study has yet found significant effects on child outcomes beyond first grade. Because pre-kindergarten programs are not likely to serve the neediest children (part-day, part-year programs), we have no way of knowing if current programs are having any short-term or long-term effects on the outcomes for high-risk children. In addition, although subsidizing education for 4-year-old children may benefit some middle-class families financially, there is little research to suggest that middle-class children benefit cognitively, socially, or emotionally from these early care and education programs.

## **Is Pre-K a Good Investment?**

### **What we know from cost-benefit analyses of early care and education**

With the current wave of interest in supporting pre-kindergarten programs at state and federal levels, analyses have focused on both the developmental benefits to the child, and the long-term financial benefits to the community. Growing out of the work of Nobel winning economist Gary S. Becker and his Human Capital Theory, researchers have begun to examine the costs and benefits of early care and education as an investment in human capital.<sup>1</sup> A variety of agencies and researchers have put forth models or policy briefs around the importance of early childhood education as a social investment, widely citing five key studies in the field that provide valuable insight into this perspective. These studies are summarized and compared below, followed by a discussion of policy implications regarding investment in universal Pre-K programs.

#### **Return of Investment in ECE:**

Five key cost-benefit analyses in the field reveal financial benefits from quality early care and education programs.

***Perry Pre-School Project:*** Found that the per child net return on the preschool program by age 27 was estimated to be \$95,646 total, with \$19,570 specific to the participant and \$76,077 for taxpayers/crime victims. In other words, in 1992 dollars, a \$7.74 return for every \$1 invested was found.<sup>2</sup>

***Chicago Parent Child Centers:*** Found that for every \$1 invested in the program, society received a \$7.14 return in educational, social welfare and socioeconomic benefits. The community benefited from the preschool by \$3.85 per dollar invested.<sup>3</sup>

***Abecedarian Early Childhood Intervention:*** Researchers found that \$2 to \$3.66 was returned for every dollar invested.<sup>4</sup>

***New York State's Universal Pre-K:*** Researchers estimated a cost savings from the program of between \$554.54-\$827.74 million, or 1.90%-2.84% of total expenditures.<sup>5</sup>

***Longitudinal Head Start:*** An analysis of program research and benefits estimated that the known benefits could alone offset 40%-60% of the total program costs.<sup>6</sup>

#### **Where do the returns come from?**

Each study was structured somewhat differently. For example, the Perry Pre-School Project, the Chicago Parent-Child Centers, and the Abecedarian project compared groups of children who received program services with randomly-selected groups of children who did not. The other programs, such as Head Start and the New York State program, estimated possible outcomes based on a review of the available research on program benefits. However, each study examined the possible financial returns in relation to the costs of providing the program services. Each study adjusted

costs over time for inflation and used discount rates ranging from 0% to 11%. Factors in the cost-benefit analysis included medium and long term outcomes, both for the child and for society more generally. These factors included:

Medium Term Outcomes:

- Reduction in special education<sup>2, 3, 4, 5, 6</sup>
- Reduction of grade repetition<sup>2, 3, 4, 5, 6</sup>
- Increase in learning productivity<sup>4</sup>
- Reduction of abuse/neglect<sup>3</sup>
- Increased maternal employment and earnings<sup>5</sup>

Long Term Outcomes:

- Increased likelihood of graduation<sup>2, 3</sup>
- Increased likelihood of secondary education<sup>2, 3, 4, 5</sup>
- Increase in wages<sup>2, 3, 5</sup>
- Increase in tax revenues<sup>3, 5</sup>
- Reduction in public assistance<sup>2, 5</sup>
- Reduction in delinquency/crime<sup>2, 3</sup>

**Who benefits?**

The Perry Pre-School Project, Chicago Parent-Child Centers, and Abecedarian programs are known for their high quality care provided to predominantly high-risk African-American populations. As such, the cost-benefits can be understood as those resulting from providing excellent and targeted supports. However, the New York State study estimates the medium term cost-benefits associated with a universal program. The studies results indicate that while the rate of return may not be as substantial as that seen in environments that are more specific, a cost-savings is still anticipated, making the development of universal early childhood education a moderate investment as between “two-fifths and three-fifths of the commitment would be recouped”. This type of analysis does not take into account the social or developmental benefits children may receive from high quality pre-kindergarten care that can be seen as valuable beyond an economic framework.

## Appendix A Details on Five Cost-Benefit Analyses

1. **Barnett, W. S. (1996). *Lives in the balance: Age 27 benefit-cost analysis of the High/Scope Perry Preschool Program*. Ypsilanti, MI: High/Scope Press.**

*Conclusions:* The net return on the preschool program by age 27 was estimated to be \$95,646, with \$19,570 specific to the participant and \$76,077 for taxpayers/crime victims. Both net totals were calculated after \$12,356 for estimated preschool costs had been deducted. (\$7.74 return for each dollar invested).

*Factors Used for Calculation:*

1. Program costs
2. Child care provided by the program
3. Elementary and secondary education-benefits due to cost reduction in elementary and secondary education. (reduction in drop-out rates not included)
4. Adult secondary education
5. Post-secondary education
6. Employment-related compensation
7. Delinquency and crime
8. Public welfare assistance

*Sample:* Children with one or two years of program participation versus non-participants, with both groups entering school at age 5. (n = 58)

*Procedure:*

- All nominal dollars for costs and benefits adjusted for inflation in 1992 dollars.
- Time value of money is specified by a discount rate of 3%, or an annual interest rate at which dollars from one year can be traded for dollars in another year. Consistent with the U.S. general Accounting Office (1992). Final analysis unchanged when an 11% rate was used.

## **2. Reynolds, A.J. (2002). Age 21 Cost-Benefit-Analysis of the Title I Chicago Parent-Child Centers. Institute for Research on Poverty.**

### *Three types of benefits:*

Parent-child: Include increased earnings capacity in adulthood projected from educational attainment as well as the benefit to parents from the provision of part-day care for children.

General public: Averted expenditures of remedial education and social welfare spending by government, reduced tangible expenditures to crime victims as a result of lower rates of crime, and increased tax revenues to state and federal government as a result of higher earnings capacity.

Society at large: Sum benefits to program participants and to the general public.

- Benefit to society from preschool - \$7.14 in educational, social welfare and socioeconomic benefits.
- Benefit to the public from preschool-\$3.85 per dollar invested.
- Benefit to cost ratio for 1 year of preschool vs. 2 years was \$12.02 versus \$5.05 per dollar investment.
- Preschool boys had a larger societal benefit to cost ratio than girls did (\$9.06 versus \$4.67 per dollar invested).

### *Factors Used for Calculation:*

1. Reducing expenditures for school remedial services through the end of high school, including special education and grade retention,
2. Reducing criminal justice system expenditures associated with arrest, adjudication, and treatment for both juvenile and adult crime,
3. Reducing child welfare system expenditures associated with child maltreatment,
4. Averting tangible costs to victims of crime and child maltreatment
5. Increasing earnings capacity and tax revenue as a consequence of higher rates of high school completion.

Note: Welfare participation and program benefits were not examined.

*Sample:* primarily low income, 93% African-American, 7% Hispanic

### *Procedure:*

- Program costs and benefits were calculated in dollar terms
- Dollar values were converted to 1998 dollars and adjusted for inflation.
- Present values of future costs and benefits were computed in 1998 dollars and evaluated at a baseline using an annual discount rate of 3 percent,
- Present value of program costs were subtracted from present value of program benefits to obtain net present value of the intervention.

**3. Masse, L. N., & Barnett, W. S. (2002). *A benefit-cost analysis of the Abecedarian Early Childhood Intervention*. New Brunswick, NJ: National Institute for Early Education Research, Rutgers University.**

*Conclusions:*

Informed by economic theory, education is both a consumption good that confers immediate benefits and an investment good that confers personal and social benefits well into the future (Becker 1964; Haveman and Wolfe 1984). Market rate of return is 5-7%. In the preschool setting alone, a net value of \$93,630, \$35,608, \$9,276, for the 0%, 3% and 7% discount rates respectively were found. For every one dollar of investment, between \$2-3.66 was returned as benefits. Internal rate of return was 7%.

*Factors Used for Calculation:*

1. Earnings and fringe benefits of participants,
2. Earnings and fringe benefits of future generations,
3. Maternal employment and earnings,
4. Elementary and secondary education cost-savings,
5. Improved health,
6. Higher education costs, and
7. Welfare use.

Note: The effects of the program on crime and delinquency appear to be negligible given earlier research in this area (Clarke and Campbell 1998); Data in 2002 dollars.

*Methods:*

Estimated benefits and costs are converted into constant dollars (deflated) and discounted to the present using appropriate rates of discount. The rate of discount reflects the opportunity cost of public resources. A range of discount rates from 0 – 7% is employed. The analysis estimates the present value of benefits minus costs for each alternative rate of discount. Additionally, estimates of the internal rate of return, the rate at which the project benefits are equal to its costs, can be generated.

*Subjects:*

The experimental design originally involved 112 children, mostly African-American, born between 1972 and 1977 with family situations believed to put children at risk of retarded intellectual and social development. A "High-Risk Index" based on household income, parental education, school histories of family members, welfare payments, parental intelligence, and parental occupation was used to determine risk for retarded cognitive development (Ramey and Campbell 1984). Selected background characteristics at program entry were: maternal education of 10 years, maternal IQ of 85, 25% two-parent households, and 55% of households on Aid to Families with Dependent Children - AFDC (Ramey and Campbell 1984; Campbell et al. 1998). Between 6 and 12 weeks of age children were randomly assigned to either a preschool program or a control group. By 1978, 104 participants remained in the study and the follow-up at age 21 involved all 104 of these participants.

**4. Belfield, C.R. (2004). Early Childhood Education: How Important are the Cost-Savings to the School System? Center for Early Care and Education.**

*Methods:*

Reviewed Perry Preschool, Head Start, Abecedarian, and Chicago Parent-Child studies in a mini-meta analysis, then examined New York States ECE program.

*Factors used for calculation:*

Examined medium and long term impacts, calculated cost savings by determining:

1. Size of the effect
2. Per child cost savings
3. Multiply these two amounts together
4. Report in 2003 dollars

*Short-term Conclusions:*

- *For child:* Enhanced academic achievement, Improved health/nutrition, Increased well-being / less abuse
- *For parent/family:* Child-care time free for parent
- *For society/economy:* Income tax revenues from parents

*Medium-term Conclusions for society/economy:*

- Reduction of special education use. Cost savings per child was between \$2,060 and \$7,996 with cost discount.
- Reduction in grade retention. Reductions between 6% and 23%. Differences in weighting of retention.
- Medium term cost-savings range \$2,591-\$9547 per child participant; New York-Conservative model-Cost savings of \$554.54 million, Representative,-\$827.74

*Long-term Conclusions For child::*

Foundation for later benefits

- Higher likelihood of graduation/ college enrollment
- Higher wages/employment probability
- Lower teen-pregnancy/delinquency

*For society/economy:*

- 'Sound Basic Education'
- Increased income tax revenues
- Lower welfare dependence
- Reductions in delinquency/crime
- Reduction in special education
- Reduction of grade repetition
- Higher student learning productivity
- Reduction in abuse/neglect
- Lower reliance on public healthcare

**5. Currie, J. (2001). Early childhood education programs. The Journal of Economic Perspectives; 15(2), pp.231.**

*Conclusions:*

Found strong evidence regarding short-and medium term benefits in Head Start, estimated to offset 40-60% of total program costs.

*Factors Used for Calculation:*

- Health and Nutrition
- Abuse and neglect prevention
- Benefits to other family members and siblings
- Preventing special education
- Preventing grade repetition
- Improvements in schooling attainment
- Improvements in wages
- Reductions in crime
- Reductions in teen pregnancy

*Methods:*

- No control - Uses meta-analysis for figures.

## References

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- <sup>1</sup> Becker, G. (1994) *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*. Chicago: The University of Chicago Press.
- <sup>2</sup> Barnett, W. S. (1996). *Lives in the balance: Age 27 benefit-cost analysis of the High/Scope Perry Preschool Program*. Ypsilanti, MI: High/Scope Press.
- <sup>3</sup> Reynolds, A.J. (2002). *Age 21 Cost-Benefit-Analysis of the Title I Chicago Parent-Child Centers*. Madison, WI: Institute for Research on Poverty.
- <sup>4</sup> Masse, L.N. and Barnett, W.S. (2002). *A benefit-cost analysis of the Abecedarian Early Childhood Intervention*. New Brunswick: NJ: National Institute for Early Education Research.
- <sup>5</sup> Belfield, C.R. (2004). *Early childhood education: How important are the cost-savings to the school system?* Center for Early Care and Education.
- <sup>6</sup> Currie, J. (2001). *Early childhood education programs*. *The Journal of Economic Perspectives*; 15(2), pp.231.