



## RESEARCH BRIEF #4: MODEL EARLY CHILDHOOD PROGRAMS

BY: JULIA ISAACS

### WHAT ARE MODEL EARLY CHILDHOOD PROGRAMS?

Much of the support for early childhood interventions comes from the strong evidence of impacts gathered from rigorous evaluations of three comprehensive, center-based programs:

- The **Abecedarian project** was a very intensive intervention enrolling children in a full-day, full-year program from infancy through kindergarten. The center-based program had low child-teacher ratios (3:1 for infants and 6:1 for preschoolers) and was supplemented by home visits during the first three years. Costs per child averaged \$42,871 for the full multi-year program.<sup>1</sup>
- The **High Scope/Perry Preschool** enrolled three- and four-year-old children at risk for academic failure in preschool classes that operated five days a week during the academic year. Teachers used a curriculum designed to support children's self-initiated learning and conducted weekly home visits. The average child-teacher ratio was less than 6:1, and program costs averaged \$14,830 per child for the two-year program.<sup>2</sup>
- The **Chicago Child-Parent Centers** provided a half-day, center-based preschool program at twenty centers run by the Chicago Public Schools. The preschool program, which averaged \$6,913 per child over two years, included an active family involvement component and a six-week summer program.<sup>3</sup>

This research brief is one in a series of research briefs on the impacts of early childhood programs. See the websites for First Focus ([www.firstfocus.net](http://www.firstfocus.net)) and the Brookings Center on Children and Families ([www.brookings.edu/ccf](http://www.brookings.edu/ccf)) for the full series including an overview and briefs on State Pre-K, Head Start, Early Head Start, Model Early Childhood Programs, and Nurse Home Visiting.

### WHAT IS THE IMPACT OF THESE MODEL PROGRAMS ON CHILDREN AND FAMILIES?

#### Cognitive and School-Related Outcomes:

Abecedarian, Perry, and Chicago Child-Parent Centers all had strong effects on school outcomes, including reductions in special education placement and grade retention, and increases in high school graduation (see long-term outcomes for information on high school graduation). One of the programs – Abecedarian – also was associated with long-lasting gains in IQ scores:

- *Reduced use of special education.* Special education placement rates fell dramatically, from 48 percent to 25 percent for Abecedarian participants and from 22 percent to 12 percent for participants at the Chicago Child Parent Centers.
- *Less grade retention.* Grade retention rates also fell for children enrolled in the three programs, with a particularly large decline for participants of the Abecedarian program (from 55 percent to 31 percent).
- *Less special education or grade retention.* The likelihood of either being placed in special education or being held back a year fell by more than half for Perry Preschool children, from 38 percent to 17 percent.
- *Higher IQ scores.* Average IQ scores of Abecedarian participants were 4.5 percentage points higher than scores of comparable children not assigned to the program (89.7 compared to 85.2, measured at age 21).<sup>4</sup>

**Behavioral and Socio-emotional Outcomes:** The model programs had positive long-term effects on criminal activity, teen childbearing, and other social behaviors, as discussed under long-term outcomes below.

**Health and Safety Outcomes:** Evaluations of these three model programs generally did not report positive or negative impacts on health outcomes. With respect to safety, children participating in Chicago Child Parent Centers had much lower rates of child abuse and neglect than the comparison group of children (5 percent compared to 10 percent).<sup>5</sup> Similarly, they had lower rates of out-of-home placement.<sup>6</sup>

**Outcomes for Parents:** The evaluations of these three model programs reported limited impacts on the children's parents. The Chicago Child-Parent Centers reported positive impacts on the parenting behaviors of mothers some years after program participation;<sup>7</sup> and a survey of younger Abecedarian mothers (those who were under 18 when their children were born) found positive effects on the mother's education levels and decreased likelihood of subsequent births.<sup>8</sup>

**Long-term Outcomes:** All three programs have had long-lasting effects on participants' education, earnings, criminal activity, and other behaviors, according to lengthy follow-up data tracking participants to age 21 and older. Substantial differences in adult outcomes are observed across numerous dimensions, even though gains in IQ and achievement test scores tended to diminish during the children's elementary school years.

- **High school graduation rates** increased under all three programs, whether measured at age 21 or older ages. For example, 66 percent of Perry preschoolers ended up with a high school degree by age 27, compared to 45 percent of the control group.<sup>9</sup>
- **Labor force performance** also was higher for participants in early childhood interventions, as measured by higher earnings (Perry and Abecedarian), higher employment rates (Perry, at age 40), higher rates of placement in high-skilled

jobs (Abecedarian, at age 21) and marginally higher rates of full-time employment or college attendance (Chicago Child-Parent Centers, at age 24).<sup>10</sup>

- Preschool attendance reduced **criminal activity** under two of the model programs: Perry preschoolers were less likely than non-preschoolers to be arrested as adults and students in Chicago Child-Parent Centers had lower rates of both juvenile and adult criminal activity (on such measures as juvenile criminal charges, juvenile violent offense charges, adult felony arrests, adult felony convictions, overall adult convictions, and adult incarceration).<sup>11</sup>
- **Teen parenting rates** among females fell from 45 to 26 percent in Abecedarian; single motherhood rates for female Perry Preschoolers dropped from 83 to 57 percent.<sup>12</sup>
- There also was some evidence of other long-term effects on **social and health behaviors**, including less receipt of welfare or social services (Perry, at age 27); reductions in use of marijuana (Abecedarian, at age 21); and fewer depressive symptoms (Chicago Child-Parent Centers, at age 24).<sup>13</sup>

**Benefit-Cost Estimates:** All three programs were found to return overall benefits that exceeded program costs, with the return per dollar invested estimated as \$3.23 for the Abecedarian model, between \$5.15 to \$17.1 for Perry Preschool, and \$7.14 for Chicago Child Parent Centers.<sup>14</sup> Expressed differently, the Perry Preschool program provides a savings stream equivalent to a 16 percent internal rate of return.<sup>15</sup>

## HOW DO THE IMPACTS OF THESE MODEL PROGRAMS VARY?

Separate outcomes by the children's race or family income are not available; all three programs served predominantly African-American children from low-income families. Sample sizes were generally too small to support analysis among different subgroups. However, the evaluation of Chicago Child-Parent Centers has found larger impacts for children with

more years of participation (entering preschool earlier and/or receiving more years of follow-up services in early elementary school).

### HOW STRONG IS THE EVIDENCE BASE FOR THESE MODEL PROGRAMS?

The evidence base for these three programs is quite strong, particularly for the Abecedarian and Perry Preschool programs, where children were randomly assigned to either a program participation group or a control group of non-participants. The third program, the Chicago Child-Parent Centers, has a somewhat weaker study design, relying on a matched comparison group rather than random assignment. All three evaluations, however, are highly regarded and measure a diverse set of child and adult outcomes based on rich data collected on both participants and non-participants over a long period of time. Still, there are some methodological concerns, most notably the small sample sizes in the Abecedarian and Perry Preschool studies and the lack of random-assignment in the Chicago Child-Parent Centers.<sup>16</sup>

### ARE THESE MODEL PROGRAMS GENERALLY VIEWED AS EFFECTIVE?

All three programs – Abecedarian, Perry, and Chicago Child-Parent Centers – are viewed as highly effective, providing a consistent pattern of moderate to large impacts on children’s school experiences (less special education and grade retention, higher school achievement and high school graduation rates). In addition, the programs had a range of enduring impacts on participants as adults (increasing earnings and employment, reducing rates of criminal activity, and reducing teen and single motherhood).

A broader question is whether other programs for three- and four-year olds are likely to be as effective as these model programs. Abecedarian and Perry Preschool were intensive pilot programs, achieving successes that may be difficult to replicate. However, as a recent analysis notes, even if outcomes only half as large as those of Abecedarian and Perry Preschool and further diluted by averaging in less effective programs, the long-term benefits of early childhood education for low-income three- and four-year olds

would still outweigh costs by more than two to one.<sup>17</sup>

In addition, while first-year impacts of the Head Start program have been smaller than for the model programs (see Research Brief #2 on Head Start), the Chicago Child-Parent Centers provide an example of successful impacts of a large-scale, ongoing program. Started with federal Title I funding in 1967, the centers were operating in 20 Chicago public schools when evaluated in the 1980s.

Finally, a recent report identifies common elements across the three studies that may guide replication efforts: all three programs intervened at early ages, used well-educated, well-trained, and well-compensated staff; maintained small class sizes and low child-teacher ratios; were intensive programs (meaning they had many contact hours with the child, a transition component and/or a parent involvement component), and had a clarity of focus on the way the program and its teachers would interact with children and families.<sup>18</sup>

### WHAT FEDERAL LEGISLATIVE ACTION LIES AHEAD FOR EARLY CHILDHOOD INTERVENTIONS?

As noted in other research briefs in this series, there is considerable legislative activity related to early childhood education for three- and four-year olds, including perennial questions over funding levels for Head Start (Research Brief #2), and new bills that would authorize federal support for state pre-kindergarten programs (Research Brief #1).

## NOTES:

- <sup>1</sup> Costs are in 2003 dollars. See Table 2 of Julia Isaacs, *Cost-Effective Investments in Children* (Washington, D.C.: Brookings Institution, 2007), [http://www.brookings.edu/papers/2007/01childrenfamilies\\_isaacs.aspx](http://www.brookings.edu/papers/2007/01childrenfamilies_isaacs.aspx) and Table 4.4 of Lynn M. Karoly, Rebecca Kilburn, and Jill Cannon, *Early Childhood Interventions. Proven Results, Future Promise* (Santa Monica, CA: RAND, 2005).
- <sup>2</sup> Costs are in 2003 dollars. See Table 2 of Isaacs, 2007 and Table 4.4 of Karoly et al., 2005, op. cit.
- <sup>3</sup> Costs are in 2003 dollars. See Table 2 of Isaacs, 2007 and Table 4.4 of Karoly et al., 2005, op. cit.
- <sup>4</sup> The cognitive and school-related outcomes for all three programs are summarized in Appendix I of Robert Lynch, *Exceptional Returns* (Washington, DC: Economic Policy Institute, 2004). All reported impacts are statistically significant.
- <sup>5</sup> Ibid. Rates of child abuse and neglect were measured between ages four and seventeen years.
- <sup>6</sup> Arthur Reynolds, Judy Temple, Suh-Ruu Ou and others, "Effects of a School-Based, Early Childhood Intervention on Adult Health and Well-Being," *Pediatric Adolescent Medicine* 161 (2007): 730-739.
- <sup>7</sup> Parenting behavior was measured when the children were nine. Figure 2.2 of Lynn Karoly, Peter Greenwood, Susan Everingham, and others, *Investing in Our Children* (Santa Monica, CA: RAND, 1998).
- <sup>8</sup> Only 23 percent of these young mothers had an additional birth (by the time the program child was age four and a half) compared to 40 percent of control group mothers; Lynch, 2004.
- <sup>9</sup> Table 3.6 of Karoly et al., 2005.
- <sup>10</sup> Table 3.6 of Karoly et al., 2005; Table 3 of Reynolds et al., 2007. The employment/college measure in the Child-Parent Center evaluation (percent ever attended college or reported  $\geq 4$  quarters of income) was significant at the 90th but not the 95th level.
- <sup>11</sup> Table 3.6 of Karoly et al., 2005; Table 1 and Table 3 of Reynolds et al., 2007. The adult measures of criminal activity for Chicago Child-Parent Center participants are measured at age 24.
- <sup>12</sup> Teen parenting rates also were lower for students in Chicago Child-Parent Centers and Perry Preschools, but the reductions were not statistically significant.
- <sup>13</sup> Appendix I of Lynch, 2004; Table 3 of Reynolds et al., 2007.
- <sup>14</sup> The benefit-cost ratio for Perry Preschool rises from 5.15:1 to 8.74:1 if one includes the value of intangible losses due to crime (i.e., pain and suffering of crime victims), and it rises to 17.1:1 when including intangible losses and following the children to age 40. The lower estimates are based on data through age 21; the data through age 40 revealed even larger than expected differences in adult earnings and rates of criminal activity. Isaacs, 2007.
- <sup>15</sup> The 16 percent internal rate of return, calculated by Art Rolnick and Rob Grunewald of the Federal Reserve Bank of Minneapolis, was based on the 8.74:1 benefit-cost ratio of the Perry Preschool program (see footnote 14). If the earnings gains of participants are excluded, the estimated rate of public return is 12 percent. The internal rate of return is a capital budgeting measure that shows the interest rate received for an investment involving payment and revenue streams that stretch over time. Art Rolnick and Rob Grunewald, "Early Childhood Development: Economic Development with a High Public Return," *Fed Gazette* December (2003): 6-12.
- <sup>16</sup> There were 111 children in the Abecedarian study and 123 in the Perry Preschool study, counting both program and control groups. In contrast, there were over 1,500 children in the study of Chicago Child-Parent Centers (CPC). The CPC program group was 989 children who completed preschool and kindergarten in the 20 public schools with Child-Parent Centers; the comparison group was 550 students who did not attend CPC preschools but did attend full-day kindergarten for low-income families.
- <sup>17</sup> Specifically, the analysis by Steve Aos and colleagues at the Washington State Institute for Public Policy estimated average impacts of early childhood education for low-income three- and four-year olds, based on findings from 48 evaluations. The researchers applied a 50 percent adjustment to outcomes from small-scale, model programs such as Abecedarian and Perry Preschool (assuming

outcomes would be lower in real-world circumstances) and a 25 percent reduction for quasi-experimental programs such as the Chicago Child-Parent Centers (in case the lack of random-assignment led to an overstatement of program impacts). Even with these adjustments, the analysis resulted in a benefit-cost ratio of 2.36: 1. Steve Aos, Roxanne Lieb, Jim Mayfield, Marna Miller, and Annie Pennuci, *Benefits and Costs of Prevention and Early Intervention Programs for Youth* (Olympia, WA: Washington State Institute for Public Policy, 2004).

<sup>18</sup> Ellen Galinsky, *The Economic Benefits of High-Quality Early Childhood Programs: What Makes the Difference?* (Washington, D.C.: Committee for Economic Development (CED), 2006).

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- Low-income working families and policies designed to improve their economic prospects;
- Economic mobility and opportunity in the United States and investments in children, such as preschool programs, that could improve their chances to get ahead;
- The key role of education at all levels in creating the skills needed to promote opportunity and reduce poverty;
- The growth of single-parent families caused by early unwed childbearing and the decline of marriage; and
- The growing fiscal problems at the federal and state levels and steps that might be taken to ensure fiscal responsibility while minimizing cuts in effective programs targeted to this low-income families and children.

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