



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

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INTRODUCTION

The early childhood field is deeply indebted to three studies of high-quality early education programs that began in the 1960s, 1970s and 1980s and have continued to the present time—the High/Scope Perry Preschool Project, the Abecedarian Project, and the Chicago Child-Parent Centers (CPC)—because these studies provide strong evidence of the economic benefits of early childhood education as an economic investment.

Each of these studies looked at the lasting impact of its high-quality early childhood program and found significant savings over the costs of these programs. These studies, however, also reveal that potential economic benefits depend on programs being high quality.

This paper is written in response to the tendency of a number of people to use the findings from these three studies to justify *any* and *all* early childhood programs without trying to extrapolate what these three studies specifically did that made a difference in affecting children in such dramatic ways. Even those who argue for *high quality* are likely to mean very different things when they use these words. This paper reflects an effort to determine what exactly about these three early childhood programs made them so successful, relying, in part, on interviews with the principal investigators of the programs.

There are several special features that make these studies of such lasting importance:

- they were designed to address questions of the impact of high-quality early childhood programs on children deemed at risk of subsequent school failure;
- they had sound research designs: 1) of randomly assigning children either to a experimental group that participated in the high-quality early childhood program (or intervention) or to a control group that didn't participate—a methodology used by the High/Scope Perry Preschool Project and the Abecedarian Project; or 2) of using a valid comparison group of children who did not participate in the experimental early childhood program and

comparing them to a group of children who did participate—a methodology used by the Chicago Child-Parent Center;

- they were longitudinal; that is, they have followed the experimental groups and the control or comparison groups of children from the time they entered school, throughout their school years and into adulthood;
- they used many different types of educational and life success outcomes or results to compare children over time, including their achievement in school, their placement in special education, their repeating grades or grade retention, their high school completion rates, their rates of adult crime and delinquency; their employment and earnings as adults and their use of social service programs; and
- they calculated the financial benefits versus the costs of participating in the experimental early childhood programs both to the participating child over time and to society.

Despite these similarities, these three programs also differed. Craig T. Ramey¹ and Sharon L. Ramey² of Georgetown University, as well as lead researchers of the Abecedarian study, summarize some of these key differences:

- they had different criteria for admission into the studies;
- they took place in different decades and in different types of communities with differing supports for families and children;
- they offered different resources to the participating children and families in the experimental or treatment groups and to the control or comparison groups; and
- they tested somewhat different early childhood interventions.

Despite these differences, all have shown consistent positive economic benefits that outweigh the program costs. W. Steven Barnett³ of Rutgers University has written numerous research

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4 Economic Benefits of High-Quality Early Childhood Programs: What Makes the Difference?

Table 1: Benefits and Costs Per Participant in 2002 Dollars

	High/Scope Perry Preschool Project (age 27)	Abecedarian Project (age 22) ⁶	Chicago Child-Parent Centers (age 21)
Total benefit for each \$1 invested (includes benefits to individual participants and to the public)	\$8.74	\$3.78	\$10.15
Public benefit for each \$1 invested	\$7.16	\$2.69	\$6.87

Source: J.A. Temple and A.J. Reynolds, in E. Zigler, W. Gilliam, and S. Jones (Eds.), *A vision for universal prekindergarten* (in press). New York: Cambridge University Press.

reviews over the years revealing that when children who are at risk of school failure participate in intensive and high-quality programs, there are sizeable benefits in terms of higher scores on tests of reading and mathematics, less grade retention, fewer placements in special education, higher educational attainment, reductions in crime and other indicators of life success.

According to a summary by Judy A. Temple⁴ of the University of Minnesota and Arthur J. Reynolds⁵ also of the University of Minnesota, as well as the lead researcher of the Chicago CPC study, using comparisons of the findings of the three studies at a comparable point in time—when the children were in their 20s—the returns on investment are impressive, as shown in Table 1.

Since these studies were conducted in different decades, some of them can calculate the benefit/cost over a longer period of time. For example, the **High/Scope Perry Preschool Project has found a total benefit/cost ratio of \$17.07 for each \$1 invested in 2000 dollars when the children in**

their study reached the age of 40 years. The other studies have likewise found that the benefit/cost ratio increases as the children in the experimental programs age. Many financial commentators, such as Arthur J. Rolnick⁷ of the Federal Reserve Bank of Minneapolis, have noted that these programs have had much better financial returns than most other public or private financial investments.

The focus on the early childhood years is timely in light of the fact that, according to the Carnegie Task Force in 1994, approximately one-third of the children entering kindergarten were judged by their kindergarten teachers as not being ready for typical kindergarten entry-level work. Furthermore, the gap between the school performance of children who begin school not ready and those who are ready typically increases over time, with those who are not ready falling farther and farther behind. Craig and Sharon Ramey note that waiting until these children fail and then providing remediation “does not sufficiently help these children catch up.” And James J. Heckman⁸ and Dimitriy V. Masterov⁹ of the University of Chicago

⁴ Associate Professor of Applied Economics at the University of Minnesota

⁵ Professor of Early Childhood Education in the Institute for Child Development at the University of Minnesota

⁶ It is important to note that the families and children in the control group in the Abecedarian Project received clinical referrals, family support services, medical care and nutritional supplements over many years. The comparison, therefore, of the treatment versus the control group represents a very conservative estimate of the impact of the overall program. Furthermore, the community in which this project was conducted was a high-resource community with few disadvantaged children and many other services to support them.

⁷ Senior Vice President and Director of Research Federal Reserve Bank of Minneapolis

⁸ Henry Schultz Distinguished Service Professor of Economics at The University of Chicago and winner of the Nobel Prize in Economics

⁹ Center for Social Program Evaluation, Harris School, University of Chicago

state that, “On productivity grounds alone, it appears to make sound business sense to invest in young children from disadvantaged environments,” particularly as the economy becomes increasingly skills-based.

Thus, there is both a need and an important opportunity to go back to the researchers who have been the principal investigators—in fact, the stewards of these three studies—to ask them to revisit their own and the other two studies and respond to the following question:

■ **What do you think these three early childhood programs did at the time that has been especially important in contributing to their remarkable and enduring effects?**

I asked the researchers to go beyond the meta-analyses of these three studies and other studies, such as the Rand Report of 2005 (Early Childhood Interventions: Proven Results, Future Promise) that has concluded, in the words of the Rand authors Lynn A. Karoly, M. Rebecca Kilburn and Jill S. Cannon that “a very limited evidence base points to several features that may be associated with better outcomes for children: **better trained caregivers, smaller child-to-staff ratios and greater intensity of service**” (emphasis added) to the children and their families. I asked the researchers to go beyond these features in their speculations because those of us who have conducted research on early childhood interventions know that an early childhood program can have trained teachers, smaller ratios and a greater intensity of services, and, yes, achieve better results, but not necessarily the kind of results that these three experimental programs achieved.

Obviously, these researchers’ responses to this question—as well as those of several other research commentators—are, in part, speculative, but they are also deeply grounded in the research literature and their own studies. The goal in writing this paper is to move the debates about high-quality early childhood programs beyond the boundaries where they have rested for years in order to trigger discussions across

the country that address the following question:

■ **What can and should early childhood programs do to make a lasting difference in the lives of children, families and society and how can standards in early childhood education reflect these findings?** If this paper achieves these

goals even in a modest way, CED will have made yet another remarkable contribution to the early childhood field in a long line of their contributions that began with its seminal report, *Children in Need*, in 1987.

This paper will begin by asking:

- What do we know from the science of early learning and development that might explain why these three early childhood programs have had such lasting effects?

The paper will then address the following questions for each of the three programs:

- What were the goals of each of these interventions?
- How were the interventions designed to address their goals?
- What did the programs for children look like?
- What were the teacher development programs like?
- What did other features of the interventions look like?
- What was the major research question that each of the interventions asked?
- How were the studies designed?
- What were some of the key findings of these inquiries, including their costs and benefits?

And finally, the paper will ask:

- What did each of these three early childhood programs do at the time that has been most important in contributing to their remarkable and enduring effects?
- What are the benefits of targeted programs to reach those children most at risk versus universal programs?

BACKGROUND

What do we know from the science of early development that can explain why these three early childhood programs might have had such lasting effects?

Once again, the early childhood field is indebted to research. Beginning in the late 1990s, the Institute of Medicine and the National Research Council of the National Academy of Sciences (NAS) convened a group of 17 leading scientists, the Committee on Integrating the Science of Early Childhood Development, who spent more than two years reviewing and evaluating the relevant research, culminating with the 2000 publication of *From Neurons to Neighborhoods: The Science of Early Childhood Development*. The work begun by that committee is now being carried forward by a new group of scientists that includes a number of the members of the NAS Council, the National Scientific Council on the Developing Child.

Jack Shonkoff¹⁰ of Brandeis University and the chair of both initiatives addresses the question of why early childhood programs might have enduring effects:

When we talk about measuring academic achievement, social adjustment and workforce success, we are talking about how the brain works, because the brain is the mediator of all learning and behavior.

And what is the brain? It is a complex and highly integrated organ that is composed of a myriad number of circuits that involve extensive connections among neurons that transmit information from one cell to another, all of which results in the full range of cognitive, language, emotional and social competences that are necessary for success in life.

The National Scientific Council on the Developing Child has formulated several principles to explain the science of brain development:

- Brains are built over a long period of time, through the continuous interaction of genetics and experience.

The brains that children are born with are relatively underdeveloped, and the ensuing developmental process involves a highly dynamic interaction between children's individual genetic predispositions and their life experiences.

- Genetics determine the *when* or the timetable for development, while experience determines the *how* or the actual construction of the circuits.

For example, at birth every healthy baby is born with a brain that has the capacity to perceive every sound of every language in the world. Over the course of the early months of life, the circuits are being developed that deal with sound discrimination. If the child is in an environment where everybody is speaking English, the child processes those sounds, but if the child is in an environment where everybody is speaking Chinese, the child processes those sounds. If the environment is multilingual, then the young child learns all of the sounds of each language. By the end of the first year of life, much of the circuitry involved in the differentiation of speech sounds is formed.

- The brain is built in a bottom-up hierarchical way, where basic circuits are established first, and they form the foundation for more complex circuits.

Continuing with the example of language, in the second year, the next levels of circuits are developed that underlie the ability to recognize that some sounds can be combined to make words that have specific meanings. Children then go from perceiving sounds to understanding their connection to meaning and then being able to produce specific words themselves. At the biological level, the brain is developing more complex circuits that build on the more basic circuits that were created previously. In other words, the increasingly complex hierarchy of neural circuits creates a framework for the development of increasingly complex behaviors and skills. The scientists at the Council have adopted a simplifying model to refer to this phenomenon: **brain architecture**.

- Some kinds of stress can adversely affect developing brain architecture.

The Council differentiates three kinds of stress. The first is **positive stress**—the kind of stress that is a part of children's everyday experiences, such as being told "no," learning to share or getting a shot at the

¹⁰ Samuel F. and Rose B. Gingold Professor of Human Development and Social Policy and former Dean of The Heller School for Social Policy and Management at Brandeis University

doctor's office. In the presence of supportive relationships, children learn how to deal with this manageable stress—lessons that are a normal and essential part of growing up. The second category of stress is **tolerable stress**, such as the death of a loved one, a serious illness, a serious injury, a devastating natural disaster, a terrorist attack and so forth. This kind of stress can be damaging, but when children have supportive relationships, they can be helped to cope with this magnitude of threat, and they can survive without lasting harm. The third category is **toxic stress**, such as living in deep and eroding poverty or in situations where children are physically or emotionally abused or neglected or exposed to ongoing family violence. With toxic stress, children don't have nurturing relationships to protect them and to help them adapt. In these circumstances, stress hormone levels remain persistently elevated, which can actually have a toxic effect on the developing brain.

How do these principles of developing brain architecture help to explain the results of the High/Scope Perry Preschool Project, the Abecedarian Project and the Chicago Child-Parent Centers? Many of the children in these studies were chosen to participate because they were at risk of school failure—that is, they came from stressful situations where they typically didn't have consistent access to the kinds of experiences or relationships that could help them to cope with adversity and develop in positive ways. Although the children in these studies

were from low-income families, it is not poverty alone that puts children at risk of school failure.

Jack Shonkoff summarizes:

These interventions provided positive learning experiences and supportive, growth-promoting environments at a time when the children's brain circuits were being built. Thus, they promoted the development of sturdy brain architecture that provided a stronger foundation for later achievement rather than disrupted architecture that would have served as a weaker foundation for subsequent failure. Moreover, because of the decreasing plasticity of the brain as it matures, it is easier to build increasingly complex circuits on a strong base than to try to adapt to faulty circuitry that was not developed properly from the beginning.

So the simple conclusion from the perspective of both the neurobiology of early childhood development and the formation of human capital is the following: "It's better to get it right the first time than to try to fix it later."

Edward F. Zigler¹¹ and Sally J. Styfco¹² of Yale University write in an epilogue to a book entitled *The Crisis in Youth Mental Health* that: "Four major systems in America are the primary determinants of a child's developmental course:" the family, the health system, the education system and the child care system. In order for interventions to work, they need to impact these systems, which all of them did in varying degrees.

THE INTERVENTIONS

To provide a picture of each of these interventions, I describe them one at a time, addressing the nature of the intervention, what the researchers set out to find, how they designed their studies and what they found.

The High/Scope Perry Preschool Project

In talking about why the Perry Preschool Study and the other two interventions might have been so effective, Larry Schweinhart¹³ of High/Scope—and a lead researcher on this study since the mid 1970s—

reinforces Jack Shonkoff's punch line, but uses a different analogy. It is one that relates to crime prevention, a key factor in the public benefit/cost analyses:

Hardly anybody knows how to prevent crime. And I've thought that maybe the problem is that a lot of crime prevention programs get out there with the kids who are about to commit crimes, and so it's like trying to stop somebody from buying candy when they're in the candy store rather than stopping them from going down the street where the candy store is.

¹¹ Sterling Professor of Psychology, Yale University

¹² Associate Director of the Head Start section at the Yale Center in Child Development and Social Policy, Yale University

¹³ President of the High/Scope Educational Research Foundation

8 Economic Benefits of High-Quality Early Childhood Programs: What Makes the Difference?

The roots of crime are in antisocial behavior that takes place much earlier in life, even at three and four [years of age]. So if you can prevent antisocial behavior in the preschool years, then you could set in motion a reduction in crime that takes place throughout life.

What was the goal of the Perry Preschool Program?

The goal of the Perry Preschool Program was to **improve the intellectual, social and emotional learning and development of young children who might otherwise not succeed in school** because:

- their parents had low educational attainment (high school or less);
- their parents had low occupational status (unemployed or unskilled);
- their homes had fewer than three rooms per person; and
- the children had low IQ scores—from 70 to 85, which is the range for borderline mental impairment although the children had no organic deficiencies.

How was the program/intervention designed to address this goal?

Three- and four-year-old children attended a part-day center-based preschool during the school year for two years, with a mean participation of 1.8 years. There was no follow-through programming into the public schools after the program ended.

In addition to the preschool program, the families in the experimental group received weekly home visits and were seen as agents of change. This project took place in Ypsilanti, Michigan from 1962 until 1967. The children were all African American.

What did the program for children look like?

The program was housed in a public school. The classroom component involved four teachers with 20 to 25 children per year. The mean class size was 22 children, and the child to staff ratio was 5.7 (children) to every one (teacher).

According to Larry Schweinhart:

If you walked into the program, you would see that the classroom was organized into activity areas: a house area, art area and a block area. They were distinct enough so that they would all be in one room, but they would be like mini rooms,

Instead of the teacher simply telling the children, “Do this now,” “Do this,” or “Answer this question,” the children were called upon to make plans, carry out the plans and review their activities afterwards.

In the small and large group activities, there was an emphasis on children initiating their own activities. For example, instead of a teacher handing out a picture and saying, “Color this picture,” the teacher would hand out paper and say, “Do something with the paper.” So there was always an element of choice in what the child was doing.

If you looked at the children, you would see them actively engaged in their own activities around the room. There might be some children by themselves; others would be in small groups. There might be a larger group or two. The teachers would most likely be sitting down with the children rather than standing up over them.

The philosophy behind the “Cognitively-Oriented Curriculum,” as it was called (and is now called the High/Scope Curriculum), was, in Larry Schweinhart’s words, “not to directly instruct the children, but to support their own choices and to extend those choices.” The teachers were not winging it, however. Teachers would have thought very hard about the children’s development and have in mind “key experiences that children should engage in to promote their learning in all the different areas of development: cognitive, social, emotional and physical.” He explains:

If the children were playing with blocks and had some red blocks and some blue blocks, the teacher might say, “Can you sort them in a certain way?” The teacher might ask a question to get the child to push forward on various kinds of cognitive skills.

What was the teacher development program like?

Most of the teachers in the Perry Preschool Project had B.A. degrees in education. They were paid regular public school teacher salaries plus a 10 percent bonus for

participating in this special program. In terms of teacher turnover, 10 teachers filled the four teacher positions over the five years of the program's operation.

According to Larry Schweinhart:

There were four teachers, a director and there was David Weikart [the project founder, director, lead researcher and director of special education in the public school]. The teacher component could be what has been sometimes referred to as a learning community where the teachers were studying Piaget. [Jean Piaget was a leading thinker about children's cognitive development at the time.] [They were also] reading other authors to develop their own curriculum. And, indeed, they were developing the curriculum that became the High/Scope curriculum during the years of the Perry Preschool Project.

What was the home visiting program like?

The home visiting program took place for an hour and a half each week. Larry Schweinhart describes the program:

The continuing message all the time [to the families] was, "You are an important educator of your child. Pay attention to your child. Observe your child closely. Pick up on the development of your child and carry it forward."

He suspects a year or two of consistent messages like this were "more important than the specific lessons." Parents were being taught to monitor their children's development and to provide experiences that extended what the children were learning, such as reading a book about fire engines to a child who was interested in fire engines. He says, "those lessons lasted not only through the preschool years, but [also] afterwards."

The parent education and the teacher education were similar in that both were teaching adults to observe and extend learning. Larry Schweinhart says:

That's an important feature of the program, and I think it has to be taken very seriously as contributing to long-term development.

What was the major research question that the Perry Preschool Study asked?

The major research question that this study poses is: Does participating in a high-quality early childhood program make a difference in children's development in comparison with children who have had no other early childhood program experience?

Initially, they looked at intellectual development, using the Stanford-Binet IQ test. They hadn't planned to craft a longitudinal study, but because the study was well designed, they have continued to assess the children over time—from ages three through 11 and then again at ages 14, 15, 19, 27 and 40.

What was the study design?

Overall, there were 123 children who participated in the study. Each year of the study's operation (from 1962 to 1967), the children were randomly assigned to either a program group or a no-program group, where the children did not participate in any other early childhood programs. As Larry Schweinhart notes:

If things had worked out exactly as planned, there would have been the same number in each group, but there were slight variations because of individual circumstances. We wound up with 58 children in the preschool classes [experimental group] and 65 in the control group.

What are some of the key findings?

Right after the program's conclusion, when the children were five and in the same kindergarten program, the experimental group exceeded the control group's IQ scores by 12 points, with 67 percent of the program participants testing above a 90 IQ score compared with 28 percent of the control group. These IQ differences faded out over time. Larry Schweinhart theorizes about what happened:

I've often thought the best way to explain this is that the children were in same program from kindergarten through 12th grade [and that] program had its effects on intellectual performance too. I've come to think that the primary value of [the intervention] was that it improved the children's readiness for school so that when they entered school, they performed better; and, because they had more success, they got more committed to school; and because they got more committed to school, they had even greater success.

10 Economic Benefits of High-Quality Early Childhood Programs: What Makes the Difference?

He emphasizes that:

The later effects of school achievement in the High/Scope Perry Preschool Study appear to be due more to commitment to schooling than to early school achievement. It is not early mastery that matters, but early commitment to the education that one experiences. Similarly, high school graduation, employment and earnings track back to commitment as much as to early intellectual performance.

In addition, he explains the finding of reduced crime:

The long-term effect of reduced crime can be explained in terms of both positive and negative behavior. In terms of negative behavior, the preschool program helped prevent young children's antisocial

behavior that was the antecedent of their long-term antisocial behavior. In terms of positive behavior, the preschool program improved educational performance and later economic performance, which surely [also] curbed antisocial behavior.

If one compares the children in the intervention and the control group in the Perry Preschool Project on the factors used to compute the benefit/cost analyses when the children in the study were at a similar point in time (in their 20s), the differences are dramatic, as shown in Table 2, which presents the findings for all three interventions: first, listing the figures for the intervention group and second, listing them for the control or comparison group on each of the outcomes studied.

Table 2: Comparison of the Three Intervention Programs on the Outcomes for the Benefit/Cost Analysis

Outcome	Perry Preschool Project	Abecedarian	Chicago Child-Parent Centers
Original sample size (program/control)	58/65	57/54	989/550
Sample recovery for high school completion	94%	95%	87%
Special education services by age 15/18	15% vs. 34% at age 15	12% vs. 48% ¹⁴ at age 15	14% vs. 25% at age 18
Grade retention by age 15	ns ¹⁵	31% vs. 55%	23% vs. 38%
Child maltreatment by age 17	n/a	n/a	7 vs. 14
Arrested by age 19	31 vs. 51	ns	17 vs. 25
Highest grade completed by age 21/22/27 (mean)	11.9 vs. 11.0 at age 27	12.2 vs. 11.6 at age 21	11.3 vs. 10.9 at age 22
High school completion by age 21/22/27	71% vs. 54% at age 27	70% vs. 67% graduation at age 21	66% vs. 54% at age 22
Attend college by age 21/22/27	33% vs. 28% at age 27	36% vs. 12% 4-year college at age 21	24% vs. 18% at age 22
Employed at age 21/22/27	71% vs. 59% at age 27	70% vs. 58% at age 21 (teen mothers)	n/a
Monthly earnings at age 27	\$1219 vs. \$766	n/a	n/a

ns = not significant; n/a = not available.

Source: J.A. Temple and A.J. Reynolds, in E. Zigler, W. Gilliam, and S. Jones (Eds.), *A vision for universal prekindergarten* (in press). New York: Cambridge University Press.

¹⁴ This comparison includes only children who received preschool education versus those who received no other educational services.

¹⁵ It is to be noted that David Weikart was the director of special education in Ypsilanti, MI and managed to get a policy in place against grade retention.

The Abecedarian Project

The word Abecedarian comes from Latin, and it means “one who learns the fundamentals, such as the alphabet.”

What was the goal?

The goal of the Abecedarian Project (or ABC) as described by Craig and Sharon Ramey, lead researchers on this study and now professors at Georgetown University, was **to improve the school readiness and later school performance of children from very low-income, multi-risk families by providing a high quality educational program. Put another way, the goal was to prevent the school failure that so many of the children were likely to experience.** It was a scientific experiment that looked at the conditions under which children’s development might be altered in positive ways.

Based on the literature on the risk factors that were most likely to lead to a “developmental toll,” the researchers created a 13-item risk index for selection into their randomly assigned experimental or “treatment group” and control group, excluding children from either group who had evidence of biologically based risk factors, such as low birth weight or Downs Syndrome. The factors for selection included:

- low family income, below 50 percent of the poverty line;
- low levels of maternal and paternal education—less than high school graduation, with 10 years of education on average;
- low maternal intellectual development, with an average IQ near 80;
- single parenthood (about 75 percent);
- no close maternal relatives in the community;
- older siblings with mental retardation or poor school performance;
- use of public assistance (welfare and/or public housing)
- contact with mental health agencies for such reasons as child abuse and neglect;
- parental mental health problems; and
- parental unemployment.

Since the purpose of the project was to test the value-added just of early education, the researchers considered other factors known to affect children’s development and provided them in equal measure to the children and families in both groups so they wouldn’t affect the findings. Craig Ramey explains:

For example, we knew that nutrition was an important factor for families at or below the margin in our society. So we provided an unlimited amount of free iron-fortified formula (since no mothers chose to breast feed). It was important that it was unlimited, because we had families who had other children or they had relatives that they would give the formula to.

We also knew that medical care could have an impact, and so we provided free or reduced-cost medical care—meaning that if the family had insurance, we would bill for it; but almost no families had insurance. The health care was provided by our staff pediatricians, following the American Academy of Pediatrics’ recommendations.

We also felt that simply paying attention to families [in the treatment group] might produce a Hawthorne-like effect, and they would do things differently [than typical families like them] if they were being paid attention to. And so we addressed that by having master’s level social workers work with families both in the control group and in the treatment group. They helped the families meet their self-defined goals, such as improved housing, clothing, access to services in the community, etc.

How was the intervention designed to address this goal?

The only factor that differentiated the experiences of the children in the control group and the treatment group was the systematic, high-quality education that the children in the treatment group received.

Beginning at six weeks of age and continuing until kindergarten entry, the children in the treatment group were in a full-day program, operating 50 weeks a year, beginning at 7:30 in the morning and going to about 5:30 in the afternoon. They participated in the program for five years. This intervention took place at the Frank Porter Graham Child Development Center at the University of North Carolina, Chapel Hill.

12 Economic Benefits of High-Quality Early Childhood Programs: What Makes the Difference?

The children were 98 percent African American. In the children's first year of life, the group size was six infants with two teachers for a child to staff ratio of 3 to 1. In second year, the group size was eight toddlers with two teachers for a child to staff ratio of 4 to 1. In the third year, the group size was 10 preschoolers with two teachers for a child to staff ratio of 5 to 1; in the fourth year, the group size was 14 preschoolers with two teachers for a child to staff ratio of 7 to 1.

The Abecedarian Program was repeated in North Carolina in Project Care and in a study of the impact of the ABC program for low-birth weight children during their first three years in eight sites.

What did the programs for children look like?

The curriculum for children was individualized, and was designed, in Craig Ramey's words, to "get away from the one-size-fits-all" notion of curriculum. Their purpose in developing this approach was to have complete specificity, from a scientific point of view, about the intervention or the independent variable, to use the scientific terminology. Craig Ramey says:

We wanted an independent variable that was both describable in detail and that was potentially replicable for other scientists who might want to try out a similar endeavor.

He describes this curriculum in action:

Let's just say we were talking about a child who is 18 months to two years of age, the time when children are just beginning to do two-word combinations, typically a noun and a verb—the classic of "look ball." If the child says "ball," then the teacher might say, "That's great. He had the red ball." And we would measure whether the child over a two-week period came to label that as a "red ball."

It was the intention of the developers of Abecedarian that the curriculum be spontaneous and feel like a lot of fun—with teaching and learning occurring all the time:

We wanted consciously to blur [what was happening] to the point of [the observers of the program] not being able to distinguish the difference between when it's curriculum time and some other time. [We wanted] the curriculum to be pervasive throughout the day and the year, but in such a subtle way that it

looks like a very natural time with kids having fun and energetic and enthusiastic caregivers providing good care for them.

But, in actuality, there were hours of planning behind the curriculum because the teachers assessed what was happening on an ongoing basis and could spot "potential problems," which informed their subsequent teaching.

What was the teacher development program like?

Teachers were paid salaries that were competitive with the public schools on a 12-month, not a 9-month scale, and, as a result, had virtually no voluntary turnover of staff. Most of the teachers had college degrees, but in a variety of undergraduate specialties, not just early education, since North Carolina at that time didn't offer degrees for those who wanted to work with children under three years of age.

The teachers in the program engaged in an ongoing cycle of observing and assessing, planning for next steps, enacting those next steps, observing and assessing and so on. This took place in weekly staff meetings, where they also received active supervision. Teachers were not handed a curriculum and told to "do it." They were learning all the time, using their own observational data and feedback from others to improve their practice.

This cycle has been fundamental to Abecedarian's achieving the results that it has, according to Craig and Sharon Ramey.

How did the Home School Resource Program and summer program fit in?

Because they questioned whether the gains the children made in the early childhood program (or pre-k program) would be sustained into kindergarten and the elementary school years, they designed a "bridge" initiative that went from kindergarten through the second grade called the Home School Resource Program. It consisted of masters and PhD level teachers with at least five years experience working with at-risk families. These teachers had a caseload of 12 families each. Craig Ramey describes this program:

Their task was to work with the individual classroom teacher to understand what each child was being asked to do, and then to be sure that the child received

help in the classroom when necessary and to work with the child's parents at home to help them understand what the teacher was expecting the child to do. They created a set of activities that parents could do at home in about 15 to 20 minutes a day that would help to reinforce what the teacher was asking the child to do in school—with a focus on reading, math and writing.

They also knew that at-risk children lose ground over the summer, so they provided a special summer camp that included all the fun activities typical of a day camp, but also an imbedded curriculum to reinforce and continue the curriculum the children had been receiving.

What was the goal of the Abecedarian Study?

The goal of the study was to address the scientific question: Can the cumulative developmental toll experienced by high-risk children be prevented or reduced significantly by providing systematic, high-quality early childhood education from birth through kindergarten entry?

How was the study designed?

The Abecedarian Study included 111 families: 57 children were randomly assigned to the Abecedarian program and 54 children were assigned to the control group. Although the children's program was pilot tested earlier, the official Abecedarian intervention began in 1972 and ended in 1977.

Research assessments of children's development and of their parents' attitudes and behavior were conducted every three months initially, and then went to a six-month basis during the time the children participated in the program. Craig Ramey notes:

We did a lot of observation of the children in their classrooms. It was the dawn of an era in which we were able to use videotape in all of our classrooms. We had cameras hung in them, and we fed that back to my laboratory. And we would make time sample observations.

They conducted numerous assessments in the center and in the children's home, including mother-child attachment and even biological tests of the viruses and bacteria in children's systems. Because there was a concern at the time that while "in caring for children

in a group setting, we might have some positive benefits in areas like social or cognitive development, [these benefits] might be at the expense of children's health status or other factors." They also visited the children in the control group who were in child care settings and conducted quality assessments of these settings. According to Craig Ramey:

We think that this is probably the most intensely studied group of children that have been reported in the literature. We typically collected about 10,000 pieces of information for the child and family per year. We were very fortunate to put in all of our data from day one into the computer. And so we were able to [use] complex longitudinal analyses.

When the children entered kindergarten, they were again randomly divided into four subgroups to test the difference that having a kindergarten to second grade program made:

- 1) children who had participated in the pre-k program and the K through second grade program;
- 2) children who had participated in the pre-k program, but not the K through second grade program;
- 3) children who did not participate in the pre-k program, but did participate in the K through second grade program; and
- 4) children who did not participate in either the pre-k or the K through second grade program.

Sharon and Craig Ramey report that their study is a conservative test of the impact of *high-quality* early childhood education in that about half of the children in their control group went to other preschool programs, and, in addition, all of the children in both groups had access to many other community resources and services that could affect them positively. They note:

In the year that we began the program, we did a community survey and found that there were 33 agencies in this community serving disadvantaged families in a town then a little over thirty thousand people—we were the 34th program.

When the children got to school, they went into one of the two best public school systems in North Carolina. Chapel Hill was also different in that [there] was a very small percentage of the population that was

14 Economic Benefits of High-Quality Early Childhood Programs: What Makes the Difference?

underprivileged. And the school system had quite a few programs to provide additional help for kids in kindergarten all the way through—but very heavily concentrated in the elementary school years.

Furthermore:

If children fell below a certain pre-specified cutoff point in either of the treatment or control [group], we referred those children for special services. So we didn't just stand by and watch the kids in the control group fail.

There was a post-evaluation when the children finished the program at eight years of age and again at ages 12, 15, 21; they are currently being evaluated at age 30.

What were some of the key findings?

The children in the treatment and control groups scored in a similar way on tests of cognitive ability during their first 12 months, essentially scoring at the national average. But after that, the control group's scores began to drop so that they were at the low end of normal by 18 months. For the remainder of the preschool years, the ABC treatment children scored between 10 and 15 points higher than the control children. If one looks at IQ, over 90 percent of the children in both groups were in the normal range at six months, but in the control group, this dropped to 45 percent by age four compared with more than 95 percent of the children in the ABC program who continued to test in the normal range.

These differences in IQ between the two groups have narrowed over the years to a difference of about five points, but there was no narrowing of “the differences in academic achievement in reading and math, which persist all the way through age 21 and perhaps beyond.”

They also looked at social emotional development. In one analysis, they compared the children in the two groups to a group of mothers and children from the general population of Chapel Hill where people are highly educated, looking at positive interactions, such as teaching, playing games and having interactive conversations. Not surprisingly, there was more positive interaction among the mothers and their children in the community group than in either the control or treatment group at six months. By 20 months, 85 percent of the mothers in the community group were highly engaged with their children, compared

with 40 percent in the ABC treatment group and 20 percent in the control group.

As Craig Ramey says:

The positive cognitive and linguistic benefits of school readiness [for the treatment group] did not occur at measurable expense to the children's social development or their positive relationships with their parents.

On the other hand, a subset of children who were rated by their mothers as having difficult temperaments early in life began to “lose ground developmentally” if they were in the control group but not in the treatment group. When the researchers further examined their data on mother-child interaction, they found that the mothers in the control group began to reduce the time they spent with these more demanding children, but not in the treatment group who increased their interaction:

We did some more analyses that suggest it was because the [ABC] program had induced a higher level of social competence, and these children were more effective at encouraging their mothers to interact with them.

They're not totally responsible for it, but the whiny child gets a reputation for being whiny and gets treated differently...and those interactions sort of predetermine what occurs next.

When they address the question of the incremental difference the K through second grade intervention made, they find that when the children are eight years old, there is a step-like pattern in the findings:

- The children who had both the preschool and K through second grade ABC programs scored the highest on tests of achievement with the children who had only the preschool scoring at the next level, the children who had only the K through second grade below that, and the children in the control group without any interventions scored at the bottom.

Craig Ramey explains that the children without any interventions at age eight scored at about the 11th percentile, while the children with both interventions were in percentiles in the mid to high 40s—near the national average.

What happens over time, [however], is that the influence of the “school age only” program diminishes to virtually zero.

When the children in the Abecedarian treatment group are compared with the children in the control group at age 21 on factors that assess real life success, the long-term benefits substantially outweigh the costs of the program, as shown in Table 2 above.

The Chicago Child-Parent Centers

The Chicago Child-Parent Centers (CPC) were developed in 1967 by Lorraine Sullivan, a school superintendent in Chicago, and were funded by Title I, a federal program that provides funding to public schools serving low-income children. When this inner-city program was first established, the centers were in four schools, expanding to 25 in the mid 1970s. Today, they operate in 15 schools through both federal and state funding. The children in the study were eligible to participate if they were from families with low social-economic status and lived in a Title I area.

A replication of the CPC program is in its third year in a public school in Madison, Wisconsin. Evaluations have documented that the program has been implemented well and that the learning gains of the four-year olds in the program are similar to those found in the Chicago CPC.

What were the goals?

Arthur Reynolds, Professor at the University of Minnesota and the lead researcher on the impact of this early childhood intervention, describes the Chicago CPC as having dual goals.

One goal of the program was to **improve the school success of the children, especially school achievement in reading and math**. Literacy, as well as communication skills, were key as well. He characterizes literacy in a much broader sense than today's typical definition of teaching children discrete literacy skills and improving their ability to take tests. By literacy, the CPC programs focused on promoting oral communication and language skills as well as positive attitudes about school.

The other goal was **parent involvement**. He defines parent involvement as "getting the parents more involved in their children's lives in school." He says:

These are the highest poverty-rated neighborhoods in Chicago. The program devoted a lot of resources into parent involvement. It was much more intensive than other preschool programs.

How was the intervention designed to address these goals?

Children entered a CPC program as three-year-olds and attended part of the day until they entered kindergarten, with a mean participation of 1.6 years. The centers were housed either in elementary public schools or adjacent to them. The children were 94 percent African American and six percent Latino.

The parent involvement program brought the parents into the schools on a regular basis, but, additionally, included some outreach and occasional home visits. Health services were also provided.

When they completed the CPC program, the children transitioned into the linked kindergarten programs (that were either housed in the same building or very close by) and attended these programs through the third grade.

What did the programs for children look like?

Children attended the program for a half-day, five days per week during the school year. The mean group size was 17 children. All classrooms had a teacher and a teacher's aide, for a child to staff ratio of 8.5 (children) to 1 (teacher). All classrooms also had parent volunteers. According to Arthur Reynolds:

Because there was a lot of involvement by adults in the classroom, the programs had the flexibility to do a lot more with the children.

There was a uniform set of learning goals across all of the centers. In each center, however, the teachers worked with a lead teacher who had responsibility for the curriculum as well as with the principal of the elementary school to implement these learning goals by selecting the curriculum materials and by designing activities for the children. In creating the curriculum, the staff also drew on the best of other early childhood model programs, including High/Scope, Bank Street College, Direction Instruction activities, Peabody Development Kits and the Chicago EARLY learning activities. Arthur Reynolds says:

The teacher-directed activities were always matched with a playgroup approach, so there was a combination of child-initiated activities with an appropriate amount of teacher-led activities.

This approach provided opportunities for children to work in large and small groups as well as on their own and receive individual attention. The approach also emphasized firsthand experiences:

There were a phenomenal amount of field trips that were integrated into the program. The children would go [on field trips, using] the Bank Street model of experiencing the world out there and then going back and talking about their experiences.

For example, Arthur Reynolds says that the teacher would take the children on a trip to a zoo. After the trip, the teacher would provide a number of books for the children to read about zoos and would also write up the children's stories into large group stories or individual books as well as develop other literacy experiences based on zoos. In other words, many of the reading, writing and math activities built upon, amplified and extended the children's firsthand classroom experiences.

He also states that the teacher-initiated activities were designed to be engaging and fun.

The teachers developed games like Alphabet Bingo. They used the Bank Street Readers and the Houghton Mifflin Readers, and they used other activities where they'd use a sheet and go through the alphabet and sound out [the letters]. It was a real direct approach to going through the alphabet, where kids could sound out, spell out and then ultimately put words together.

What was the teacher development program like?

All of the teachers in the Chicago CPC program had bachelor's degrees and were certified as early childhood teachers. Since they were part of the public schools, their compensation was the same as that of other teachers in the public school system. Staff turnover was very low. Teachers were highly committed to the program, and the overall school climate was designed to be very positive.

Curriculum development was designed as a collaborative pyramid-type process: the teachers worked with a teacher in the center who had the "ultimate responsibility for the program," and who, in turn, worked with the elementary school principal who was the "true instructional leader." Arthur Reynolds thinks that

the fact that "the teachers had a lot of leeway" in developing the curriculum made a difference as did the fact that the school principal was highly involved. He notes the teachers used staff meetings to analyze what was working and what wasn't:

They had meetings throughout the year to amplify and talk about the curriculum and how it was working [for each child] and how the parent involvement was working.

Based on these meetings, plans were made for improvements and for follow-up activities. He describes these meetings as a "professional development enterprise," additionally pointing out that there was a "larger professional development network" in the public schools" in Chicago at the time that was very advantageous for the program:

The larger professional community emphasized self-improvement and provided a lot of feedback for the teachers.

What was the parent involvement program like?

Just as they had a teacher in each center with responsibility for curriculum development, they also had a teacher with responsibility for the parent program who staffed a parent resource room. In addition, each center hired paraprofessionals, typically parents of former students in the program to be liaisons between the center and the families. These parents were called "the community-school representatives." They conducted home visits, helped families mobilize community resources, enrolled families and worked with the parent resource teachers on the parent program.

The focus of the parent program was to get parents involved in the actual life of the center. Arthur Reynolds differentiates this approach from home visitation:

It's a family-school partnership model of parent involvement. Parents were expected to volunteer in the classroom, to go on field trips with the kids and to participate in parenting skills workshops at the center. Although there were some home visits, the parents primarily went to the center instead of the staff going to visit the parents at home.

Parents whose children participated in the CPC program signed an agreement to participate in the

program the equivalent of a half a day each week. Arthur Reynolds says:

I think a kid notices whether a parent is involved or not—it's a source of pride for the kid: they're not in this alone. [In this intervention], the teachers and the parents in conjunction with the kid are trying to tailor services as much as possible in order to have that kind of involvement to improve the school environment [so that it's] more conducive to learning.

[In addition,] parents are also enhancing their skills because they take GED courses, they take parenting skill workshops, home economics, how to balance their checkbook, etc.

How did the kindergarten through third grade program work?

When the Chicago CPC originated in the late 1960s, Title I provided federal funds for both the preschool and elementary school programs. After 1977, the fiscal support was split between the federal and the state governments, but the ethos of building a unified program had evolved and was maintained. There was joint planning and strong communication between the preschool and the early elementary school program. In addition, there was a unified vision of reading and math skill development and of parent involvement. Arthur Reynolds suggests thinking of the CPC program as a “small school setting” that spans the early childhood years:

The kids didn't have to go somewhere else for kindergarten. They moved as one group into an integrated kindergarten program and then could walk across the street or to another wing of the elementary school to get first, second and third grades. That meant that kids who started at age three could get six consecutive years in the same school environment—the preschool aspect was only one component of the overall unified program. The staff wanted to continue the high-quality learning that the kids were getting in preschool into kindergarten and first grade [and beyond].

Arthur Reynolds observes that, as in any real world setting, the integration wasn't perfect. Still, it has provided a great deal of continuity for the children and families:

At each site, they selected their own curriculum. It wasn't true that in all cases they had exactly the same curriculum from ages three through nine, but there

was a lot more communication, a lot more coordination, and a lot more integration of the other services than usually happens. Compared to what was out there, it was phenomenally successful!

The extended CPC program included reduced class size (from the typical 35 to one to 25 to two, which includes a teacher and an aide), one-on-one tutoring and a staffed parent room.

What was the major research question that the Chicago Parent-Child Center asked?

Initially, the study set out to examine the impact of the centers and of the parent involvement component on children's school achievement in kindergarten. The study evolved, continuing to assess the children between kindergarten and the seventh grade and then again at ages 15, 17-18 and 22.

How was the study designed?

Because the program was already in operation when the research was instituted in the kindergarten year, the study did not use a random assignment technique whereby children were randomly assigned to an experimental or a control group. Instead, this study has followed a group of 989 children, representing all of the children born in 1980 who attended the 24 Chicago CPCs from 1983 through 1985. This group has been compared with a group of 550 children of the same ages who were all equally eligible for the program from poor neighborhoods from five randomly selected schools outside of CPC neighborhoods. The children in the comparison group received the kind of early interventions that were typically available for children in inner-city Chicago at the time, including Head Start.

All of the children, including those in both the experimental group and the comparison group, received a full-day kindergarten program (including some who received CPC services in kindergarten). Arthur Reynolds points out that the kindergarten programs were high in quality and innovative. He says:

We think that we have a conservative bias in our study. If we had compared the children in this intervention to other children with no kind of center-based early child care before first grade, then our findings would be even stronger. We looked at the children in the experimental centers comparing them to children

who received the programs and services that children like them usually receive.

Adding to this conservative bias is the fact that the children in the experimental CPC program were from the very highest-poverty neighborhoods, whereas the children from the comparison group had attended schools with lower levels of concentrated poverty. It is also important to note that the children in the comparison groups were from randomly selected schools participating in the alternative intervention (all-day kindergarten). This design helped to ensure that the motivation bias would be very minimal.

What were some of the key findings?

In the first assessment, the children entering kindergarten were given the Iowa Tests of Basic Skills which is not an IQ test, but rather an assessment of literacy skills and scholastic achievement. The children in the CPC preschool group tested at the national average (the 47th percentile) using a cognitive composite measure, while the children in the comparison group were at the 28th percentile. Arthur Reynolds says:

That difference is a huge difference. The bottom line is: the Perry, Abecedarian and CPC projects all found that at the beginning of kindergarten, the children in these experimental programs had .65/.75 standard deviation units of gains or effect—which is quite large. These standard deviations are equivalent to about a 50 percent improvement over the comparison group in cognitive skills—roughly a two-thirds of a year of performance advantage.

These effects continued to show up in tests of school achievement, all the way up to age 15, where we saw significant differences in reading and math achievement associated with attending the CPC program.

When IQ is used as a measurement, other studies have found that early differences between children in the experimental and control groups tend to “fade out” over time. But that is not the case when scholastic achievement is measured. Arthur Reynolds says that while “the actual effect size does reduce over time, perhaps as a function of the other experiences the children are having, there is still a meaningful effect on achievement test scores.” He speculates that there may be a chain reaction, with the higher rates on test scores affecting teachers’ expectations for the children,

making it less likely that the children would be retained or placed in special education. “What we found,” he says, “was a 40 percent reduction in the rate of both special education and grade retention from the first through eighth grades.”

They also found a significantly higher rate of parent involvement in the children’s education throughout the elementary school years, “leading us to see a link to [lower levels of parental] abuse and neglect, juvenile crime and juvenile delinquency. The links between these findings may be as follows:

One of the biggest causes of maltreatment in inner-city areas is social isolation from the social institutions that support the family—whether it’s health care or the schools. And the whole point of this program was to make those relationships stronger.

Over the years, the researchers have been able to ask a series of other questions through analyses of their data. One concerns the differential impact of the preschool and the extended program that continued through the third grade. They found that the preschool program had the greatest impact on parental child abuse and neglect, juvenile crime and arrests, and educational attainment. Arthur Reynolds notes that the kindergarten and school-age program did make an additional difference:

We found that the extended program contributes at least as much as the preschool program to [the findings of improved] school achievement and [lower placement in] remedial education.

Another question they asked relates to the differential impact of teacher-directed versus—or in conjunction with—child-initiated curricular approaches. They found that the children who experienced both were at an advantage:

Where there was a heavy emphasis on child-initiated and teacher-directed activities, those children started school most ready to learn [in terms of] literacy skills. Both elements are quite important.

Despite the differences in the three programs, the benefit/cost findings for the Chicago Child-Parent Centers are very similar and impressive to those in the other two interventions, as shown in Table 2.

PROBABLE CAUSES OF THE ECONOMIC IMPACT

What did each of these three early childhood programs do at the time that has been most important in contributing to their remarkable and enduring effects and return on investment?

The Basics

As research reviews have pointed out, there are what Arthur Reynolds calls a few “overarching principles” that these three interventions had in common. I am calling these “the basics,” but they are often far from basic. As numerous states and communities increase the provision of early childhood and pre-k programs, they may use these three intervention studies to sell the concept, but then stray from these underlying principles. If the architects of early childhood programs today, however, want to achieve real results with their programs for the children at greatest risk, they need to work toward having these basics in place.

■ They began early.

The Abecedarian Program began in the first months of life, and the Perry Preschool Project and the Chicago Child-Parent Centers began at age three.

■ They had well-educated, well-trained and well-compensated teachers—with resulting low staff turnover.

Most of the teachers either had at least a bachelor’s degree or a higher degree in education, and they received many contact hours of in-service training. In addition, they had the time and resources to reflect on what the children were learning, which as we will see later was essential to these programs’ successes. They were paid competitively with public school teachers and the resulting staff turnover in all three interventions was low.

■ They maintained small class sizes and high teacher-child ratios.

The class sizes ranged from six to 14 (Abecedarian Program from infancy to preschool) to 17 (Chicago Child-Parent Centers) and to 22 (Perry Preschool Program).

The ratios for infants in the Abecedarian Program were 3 to 1 and for toddlers, they were 4 to 1. For

preschoolers, the ratios ranged from 5.7 to 1 (Perry Preschool), 5 to 1 and 7 to 1 (Abecedarian) and 8.5 to 1 (Chicago Child-Parent Centers).

■ They were intensive programs.

J. Ronald Lally¹⁶ of WestEd says that each of these three interventions “came to understand the population that they were dealing with and designed a level of intensity to meet [the needs of] that population.”

Intensity can be described in several ways, including the contact hours with the child in the program, work with parents and extension into the school-age years.

Contact hours

Each of these programs provided an intensive intervention, including many contact hours with the children for more than a year (1.8 years for the Perry Preschool Project, 1.6 for the Chicago CPC and 5 years for Abecedarian).

Ed Zigler from Yale University worries that a lot of states are not heeding the lessons from these studies and initiating pre-k programs for only one year although “there’s research that shows that two years are better than one year.”

Transition into the early elementary years

Two of the three interventions went beyond the preschool years—an issue that Ed Zigler also sees as important because too many low-income children go to very poor schools.

Abecedarian provided a “bridge” program where degreed educators were hired to come into the schools and work with the teacher, the child and the parent from kindergarten through the second grade. They found that this intervention affected children’s development in the elementary and teen years, but at the age of 21 no longer made a significant difference in

¹⁶ Co-Director of the WestEd Center for Child and Family Studies

the outcomes they were assessing. On the other hand, the Chicago Child-Parent Centers encompassed the early years of development—preschool through third grade—which was seen as fundamental to their philosophy of change. They found that the extended program contributed at least as much as the preschool program to children’s eventual school achievement and lower placement in remedial education—findings that have stayed significant when the children in their intervention were in their 20s.

Whether these different findings relate to fact that these were different kinds of interventions is a research question that should be pursued.

Parent Education/Support

Two of these programs worked intensively with parents to have meaningful connections between home and school, albeit in different ways. The High/Scope Perry Preschool Project worked with families in their home for an hour and a half each week, essentially teaching them to observe children and then extend their learning. Larry Schweinhart says that “parents learned to think like teachers” and suspects that this made a difference in children’s development, though the study did not test this hypothesis. Interestingly enough, the parents in the experimental group were less involved in their children’s subsequent schooling than the parents in the control group because “their children caused less trouble in school.” In contrast, the Chicago CPC program was designed to bring the parents into the classrooms a half-day per week. Arthur Reynolds says:

There’s something extra that you’re getting with the extra family commitment that’s having an impact on children and the family well-being on behalf of the child. We also found that kids in CPCs were less likely to move to change schools [but stay in the program linked with the CPC] and [were] more likely to go to the magnet schools which are the best schools in Chicago.

We’ve done some of the follow up work to show what is generating these long-term effects [our study has found]. In the Chicago Child-Parent Centers, we find that a large part of it is the family’s involvement in the program. I’ve always called it the “school support hypothesis.”

Both of these programs were aimed at connecting the home and school by creating lasting relationships and by extending the children’s learning. This is very

different from many home-visiting programs that have little to do with the children’s classroom experience.

On the other hand, Sharon Ramey—based on two reviews of the literature and on another study she and Craig Ramey conducted called Project Care—has not found evidence that parent involvement makes a difference, although, again, as she points out, the practice of parent involvement differs in many ways.

■ They focused on children’s learning—not just their achievement.

The curricular approaches in these three interventions were informed by the best available research on the children’s development and children’s learning. Sharon Ramey sums the basics up by saying:

The interventions that show strong outcomes tend to be ones that have a curriculum that is informed by the-ory; the programs tend to have quite a few hours of direct contact with the child in classrooms where ratios are good and where teachers get a lot of training or monitoring or supervision.

Success depends on more than the basics

What else matters besides the basics? This question was a major reason for writing this paper. There was the important opportunity to ask the lead researchers what they think each of these three early childhood programs did at the time that has been most important in contributing to their results and their return on investment. Each researcher speculated about his or her own intervention and then about the other two. I also interviewed two other well-known researchers—Edward Zigler of Yale University and J. Ronald Lally of WestEd—to comment on the intervention researchers’ comments and to put forward their own views in response to the question. To their views, I have also added my own observations.

Interestingly, as opposed to the basics above which are costly for the children at greatest risk (even though the benefit/cost analysis is extremely favorable), the principles I describe below have much more to do with ways of thinking about and interacting with children, their families and with colleagues rather than with programmatic features that cost money. It is my hope that these features will inspire discussion, debate and action.

- **There was clarity of focus in each of these interventions. The leaders of these interventions, all of whom were highly trained experts in early childhood education, were very intentional about what they wanted their programs to accomplish and built support among participants and in the larger community for accomplishing these goals.**

As Larry Schweinhart says:

Clarity of focus is more likely to give you the effects that you focus on.

Having this kind of clarity in the goals set for the projects obviously originated at the top with the leaders who designed and implemented the interventions, and leadership is always critical to program success.

In the case of these three initiatives, the clarity of focus was also built into the very fabric of the programs by the leaders. The classroom teachers knew what the interventions were trying to accomplish, and they knew what was being measured—or to use current terminology, they knew what they were accountable for. In fact, these programs designed accountability into the everyday processes with the staff. For example, in the Abecedarian project, the teachers developed the next steps in learning for each child based on their regular observations of the child, and then they assessed whether or not the child met their expectations. If expectations weren't met, teachers could make mid-course corrections right away. Ron Lally notes that this internal consistency did not come from following a curriculum by rote. It came because there was an alignment between the overall goals of the project and the strategies used to achieve those goals.

Although the families whose children were selected to be a part of the interventions were randomly chosen, those who did become involved could see the concrete value of these programs for their children and families.

The fact that these three interventions were also part of the larger educational institutions in their communities can also be seen as related to their success. Not only were the people within the interventions a part of trying to achieve the goals of the initiative, but the program leaders were also able to engender success in other related institutions. Arthur Reynolds notes:

The Chicago Child-Parent Centers are a P-3 [preschool through third grade] model in many ways.

Having that organized framework all the way through was to their advantage.

He points out the Perry Preschool Project was also within an elementary school, and that the fact that the project originator, David Weikart, was an administrator (director of special education) in the school district probably built support from the school system for the project's success. The Abecedarian Project was a part of the University of North Carolina, Chapel Hill.

Perhaps one reason for this support was that each of these interventions was designed by its leaders to be responsive to the needs of the specific children, the specific families and the specific communities in which they were located.

- **These interventions focused on the whole child—the child's intellectual, social, emotional and physical growth and well-being.**

Based on a review of approximately 800 studies, Craig and Sharon Ramey have outlined the following seven essentials transactions for caregivers with young children:

- 1) Encourage exploration
- 2) Mentor in basic skills
- 3) Celebrate developmental advances
- 4) Rehearse and extend new skills
- 5) Protect from inappropriate disapproval, teasing and punishment
- 6) Communicate richly and responsively
- 7) Guide and limit behavior

It is clear that these seven transactions center on the social, emotional, physical and intellectual development of young children. And so did each of these interventions, where the goals and activities, in varying measure, were designed to promote all aspects of children's development.

As Arthur Reynolds says:

To do good educational enrichment, you can't have a disruptive classroom. Kids have to be polite, and they have to know how to get along with other kids. If you're promoting good school achievement and literacy, then, as part of that, you have to do social skills' development.

22 Economic Benefits of High-Quality Early Childhood Programs: What Makes the Difference?

He says the teachers wouldn't be able to focus on achievement if the children in the program were disruptive and describes the Chicago Child-Parent Centers as "holistic"—that is, they focused on the whole child.

Craig Ramey similarly says:

All of these programs have had an emphasis on cognition, language and social/emotional development. You can't care for kids for either a half-day or a full-day and not have a responsible program—and you don't have a responsible program, if you don't do that.

Ed Zigler stresses the importance of including health and nutrition in the whole child approach, asking:

Does anybody really believe that a kid who's ill or hungry can do very well educationally? I don't think so.

There have been increasingly heated debates in the United States, however, about the relative merits of promoting intellectual skills (or "hard skills," as they are sometimes called) versus learning social and emotional skills ("soft skills") where intellectual and social-emotional development are often seen as pitted against each other. Because this has become such an important and, at times, a very divisive debate, it bears addressing in this paper.

There is, in fact, important evidence by several researchers—including Greg Duncan¹⁷ of Northwestern University and his colleagues—that academic skills beget academic skills. Using longitudinal data sets, they have found that children's early academic skills are the strongest predictor of their later academic achievement—more so than children's social skills, with the exception of skills that are related to children's approach to learning, such as their ability to pay attention and stay focused.

My reading of the literature, however, calls for reframing this debate away from this either-or notion. Firstly and very importantly, children's *intellectual* learning occurs through their *emotionally* engaged social connections with other adults and children.

For example, how children learn vocabulary is well-illustrated in the research of Betty Hart¹⁸ and Todd R. Risley¹⁹ described in their book entitled *Meaningful Differences in the Everyday Experiences of Young Children*. They found—on the basis of years of intense observation of a group of 42 diverse parents and children beginning in at nine months of age and continuing through 36 months—that parents use two different types of language in talking with their children, even when their children are preverbal.

One type of language is "business talk"—saying things like "stop that," or "do this," "come here," or other words that express the adult's needs. This language is not very rich; it is matter of fact, direct and doesn't involve many words.

The other type of language is "extra talk"—where parents talk about "what if" and "remember," "what do you think" or use other words that respond to, elaborate and extend what their children are doing or saying. This rich talk, where a large vocabulary is used, is a part of the emotional and social inter-connection (or social "dance," as they call it) between parent and child, and it conveys meaning and intellectual ideas.

Furthermore, Betty Hart and Todd Risley found that this "extra talk" (not the business talk) has a very high correlation with children's performance on IQ tests at three years of age and with their performance on achievement tests in the third grade. When the researchers compared the relative importance of children's socio-economic status and ethnic background versus the "extra talk" they experienced, they found that only the extra talk made a difference in children's academic success.

The second important point is that I think that the assessment of social-emotional skills needs some redefinition. Social-emotional skills typically include the child's ability to get along with friends (such as helping them and expressing empathy); internalizing behaviors (such as anxiety, sadness, loneliness and low-self esteem); and externalizing behaviors (such as getting angry, acting headstrong and getting into conflicts). In addition, some researchers have looked

¹⁷ Edwina S. Tarry Professor, School of Education and Social Policy Faculty Fellow, Institute for Policy Research, Northwestern University

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at what is called “approaches to learning” (paying attention, persistence, engagement in learning and organization). I suggest that researchers also focus on what I call “SEI” (social, emotional and intellectual) skills. For example, to name two:

A SEI Skill: Perspective Taking

One example relates to what is called “theory of mind.” Theory of mind means that children learn that what they themselves think and what other people think can be different. The SEI skill is learning to take the perspectives of others. Although this skill unfolds developmentally in the toddler and in the early preschool years, it is learned through interactions between adults and children, and it can be enhanced when parents are more comfortable talking about emotions, according to the research of Ross Thompson, Professor at the University of California, Davis. There are many cognitive advantages to this skill, but there are social ones as well. For example, children who learn to take the perspectives of others are less likely to be aggressive, according to Larry Aber, Professor at New York University’s Steinhardt School of Education.

A SEI Skill: Planning and Evaluating

Larry Schweinhart points out that the sequence of skills fostered in the High/Scope Perry Preschool Project—having children make plans for the work they were going to do in the classroom, following through and doing the work, and then evaluating their initial plans—appears to have contributed to the Perry Preschool Study findings that their intervention reduced delinquency and crime. He says:

It makes sense that if you’re learning to anticipate consequences, you’re less likely to engage in anti-social behavior because you can see it’s not going to get you where you want to go.

He says that problem solving can be applied to achievement in school, but also in better dealing with everyday life situations.

It has likewise become commonplace in the business world to highly value what author and psychologist Daniel Goleman has termed EQ or “emotional intelligence.” Taking a business perspective, James Heckman, Nobel Prize-winning Professor of Economics at the University of Chicago—likewise

argues that an individual’s effectiveness in the workplace is not just a matter of intellect, but it also relies on a variety of social and emotional characteristics.

Thus, I suggest that we emphasize the synergies (rather than the differences) between the social, emotional and intellectual domains both in the way that learning takes place and in the kind of skills that are learned.

■ The relationship between the teacher and the child was seen as central to the child’s learning.

In all three programs, the ongoing relationship that the teacher developed with each of the children was understood to be very important to children’s learning.

This is one of the most enduring lessons from the research on the brain development of young children. As *Neurons to Neighborhood* states:

Human relationships...are the building blocks of human development.

Ed Zigler points to the long research history revealing that one of the key components of good quality in early childhood programs is the teacher and the teacher’s relationship with the child.

■ The children in these programs were viewed as active and experiential learners.

The curriculum in all three interventions provided children with firsthand, engaged learning experiences. Larry Schweinhart describes what a visitor to the Perry Preschool Project would have observed:

If you looked at the children, you would see them actively engaged in their own activities around the room.

Craig Ramey also describes what a visitor to the Abecedarian Project would have seen:

We wanted consciously to blur [what was happening] to the point of [observers of the program] not being able to distinguish the difference between when it’s curriculum time and some other time. [We wanted] the curriculum to be pervasive throughout the day and the year, but in such a subtle way that it looks like a very natural time with kids having fun and energetic and enthusiastic caregivers providing good care for them.

24 Economic Benefits of High-Quality Early Childhood Programs: What Makes the Difference?

Arthur Reynolds similarly emphasizes that an observer to the Chicago Child-Parent Centers would have seen the children having firsthand experiences:

There were a phenomenal amount of field trips that were integrated into the program. The children would go [on field trips] . . . experiencing the world out there and then going back and talking about their experiences.

These three interventions built on the fact that children are born engaged in learning. In addition and to varying degrees, the interventions aimed to strengthen children's active involvement in learning by being taught to take increasing responsibility for their own learning, such as the process used in the Perry Preschool Project where children were taught to make plans for their activities in the classroom, carry out those plans and then evaluate them.

Sharon Ramey notes that the Abecedarian Study found that children in the intervention were more likely to feel that they had some control over their educational achievement (called "locus of control") rather than feeling—as more typical of low-income children—that things happen because of circumstance or luck. She says:

In the children who received the five years of the pre-school intervention, there was locus of control in the domain of the academics. The kids who received the treatment took more responsibility for their performance and were less likely to attribute it to luck or the teachers' opinions, [or] whether it was a good day or those kinds of things. They had internalized more locus of control and equated their performance in school with their own efforts, whereas the children in the control group were significantly less likely to.

She notes, however, that a sense that one has control over what happens in school did not carry over into their feelings about life in general where they were just as likely to attribute success to external rather than internal factors. She says, however, that having a greater sense of control over their school success is very important, "if you're looking for clues as to how a life course could get changed."

Ron Lally emphasizes this point by saying that in good quality programs, the child is truly valued as a contributor.

■ **There was a mixture between responsive teaching that extended and elaborated on what the children were already learning and direct teaching, but the direct teaching was also designed to be engaging and to extend children's learning. The curriculum was not set in stone, but [was rather] a framework for learning.**

While the Perry Preschool Project was based on teaching that was responsive to what the child-initiated, the other two interventions combined approaches. In his analyses of the Chicago intervention, Arthur Reynolds has found that both responsive teaching and direct teaching are important, and that children who didn't have teachers who focused on basic skill enhancement were at a disadvantage. He also emphasizes that this skill enhancement should not be "drill and kill.:"

The teachers in the CPCs weren't afraid to pull out the Bank Street Readers [emphasizing a whole language approach], but they also pulled out the Houghton Mifflin materials to go through the alphabet, but doing it in a fun way.

He sees the fact that the Perry Preschool Project emphasized child-initiated learning and that the Chicago CPCs emphasized both child- and adult-initiated learning, and yet both had similar findings as evidence that "it isn't just curriculum that matters:"

Whatever curriculum you use, you have to tailor it to the kids' developmental level—where you want them to go.

In other words, the curriculum needs to fit the children, their families and the program goals. One size (i.e. simply using a canned curriculum off the shelf) does not fit all.

■ **Although the teachers were better-educated, better-trained and better-paid than the average early childhood teacher—there was also a strong focus on their ongoing learning. The model of adult learning was not one of pouring information into "an empty vessel," but one of providing time and resources for the teachers to reflect on what the children were learning and on their own teaching to find ways to improve their teaching practice.**

Larry Schweinhart describes the staff development for the Perry Preschool Project as a “learning community:”

The teachers were studying Piaget...and reading other authors to develop their own curriculum. And, indeed, they were developing the curriculum that became the High/Scope curriculum during the years of the Perry Preschool Project.

In the Abecedarian Project, the teachers engaged in an ongoing cycle of observing and assessing the children, then planning and enacting activities that challenged the children, and then enacting and evaluating those next activities and the children’s learning. They also received regular active supervision. As Craig Ramey puts it, teachers were not handed a curriculum and just told to “do it.”

In the Chicago Child-Parent Centers, there were uniform goals, but how these goals were enacted depended on the teachers: the lead teacher with responsibility for the program and the school principal. As was the case in the other two interventions, staff meetings were a time to share observations and assess what was working and what wasn’t in order to plan next steps.

It was a time, as Ron Lally points out, to learn to read children’s cues and clues and how to respond to them.

Arthur Reynolds observes that the combination of having a background in early childhood education and having ongoing interaction with others about improving their teaching practice made a difference:

Teachers have to be able to adapt and tailor the program to make sure that the kids are learning in the classroom.

He notes that children will vary or “be in different places,” no matter what one does, and teachers need to respond to those individual differences which is why smaller group sizes and higher teacher to child ratios matter. Ed Zigler says, “That’s what a good teacher does—individualize the instruction—be sensitive to the cultural differences in children.”

Craig Ramey summarizes why ongoing staff learning through observation and feedback is so important.

The programs that have produced what I think are the biggest differences have had some kind of an ongoing

in-service component. So it isn’t just a matter of “you get some good people, you choose the curriculum and then you walk away from it.”

Ron Lally adds that research on young children’s development reinforces the findings that the best teaching is based on responding to and extending children’s interests and skills:

*And [these findings have] been missed over and over and over again by people who are anxious about school readiness and literacy. And so [if] we’re looking at really taking the science seriously, [we’re] saying that the **teacher needs to act as a researcher**—to view the child and then to step back and [ask]: what is my hypothesis for what I should be doing next and making the distinction between what works and what doesn’t work.*

Ron Lally further states that in the most successful interventions, teachers had “time to talk about what was going on” and they received “reflective supervision.”

When parents and teacher are treated as learners, they can become learners together, forming the basis for stronger teamwork and communities.

There is a great deal of discussion about the importance of assessment of children these days. One of the points these programs make is that assessment works best if it is a part of reflective teaching practice and is used to guide improved practice, rather than a tool to label or judge children or teachers.

What are the benefits of targeted programs to reach those children most at risk versus universal available programs?

It is obvious that these three well-known interventions were conducted with children at-risk of school failure. So I ended my interviews with the researchers by asking them what the implications are of these findings for developing targeted programs just for children at-risk or for developing universally available early childhood programs.

Everyone interviewed agreed that the findings tell the same story—that those most at risk will make the greatest gains from early childhood programs (and conversely the social costs will be the highest for a failure to intervene on their behalf). There was strong

26 Economic Benefits of High-Quality Early Childhood Programs: What Makes the Difference?

support, however, for universally available early childhood programs for several reasons.

First, it is also clear from the research that all children can benefit from good quality early childhood programs. As Ed Zigler and Sally Styfco write:

There is now complete consensus that any intervention will show greater effects with low- as compared to middle-SES populations. Evidence, however, is accumulating that middle-class families also profit from early childhood interventions.

They argue for universally available programs with “targeted add-ons” to meet the differing needs of children at greater risk.

The second argument concerns building political will. The researchers note that there has never been a durable reform that wasn’t uniformly available. To try to improve education, in the words of Ed Zigler, it is

important to “go for universal” where everyone gets something out of it.

Although the benefits of good quality early education have clear economic benefits, as this paper shows, Larry Schweinhart also feels that there is an ethical question at stake:

Every child needs a good early childhood education. That’s an ethical principle that transcends what the data say.

And so the societal question we face is: will we heed the neurobiology findings—that “it’s better to get it right the first time than to try to fix it later?”

This paper makes it clear that we have the knowledge to “get it right.” The knowledge is there to improve teaching practice, to develop supportive public policy, and to develop state early childhood standards that are aligned with best practice.

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High-quality preschool gives children a strong start on the path that leads to college and career success. But what constitutes quality? This brief answers that question... Economists also have shown the benefits of early education investments, which generate approximately \$7 for every dollar invested. Sneha Elango, et al., Early Childhood Education (working paper #21766, National Bureau of Economic Research, 2015); Timothy Bartik, From Preschool to Prosperity: The Economic Payoff to Early Childhood Education, 2014. However, the potential of preschool can only be realized if programs are of high quality. Appropriate child assessments High-quality early childhood education programs assess the whole child. Even though children in daycare programs can develop intellectually, children benefit most when parents stay at home with their children and educate them. Most childhood education specialists claim that young children learn best when they're not pushed too hard, they have an opportunity to interact with their peers, and their parents and instructors treat them kindly. Likewise, children learn best when instruction and educational activities are only a small portion of their days. The economic benefits, for example, can be immense when emphasis is placed on early childhood education. Recent research from the National Association of State Boards of Education found that it is futile to establish federal educational goals without pre-kindergarten education programs. The positive effects of high-quality early childhood programs on specific, short- and long-term outcomes for children, families, and communities, have been quantified by numerous research studies.⁸ In the short- to medium-term, children enrolled in high-quality early learning programs are less likely to need special education services during their K-12 years; are less likely to commit juvenile offenses. As such, the quality of an early childhood program is dependent on the following three key factors. Interpersonal interactions. CLASS has separate scales for different age groups, reflecting the differences in how infants, toddlers, and preschoolers learn. The infant observation has just one domain while the pre-K observation has three domains. For those who were enrolled in the high-quality early child programs, the beneficial outcomes included improved adult health, particularly the reduction among males in metabolic syndrome, which raises the risks for heart disease, diabetes and other health problems. The researchers also found that children in the two programs saw a permanent boost in IQ. Quality early childhood programs start with effective perinatal care for mothers and begin at birth for children. Early health and nutrition should be integrated into early childhood development programs. Early health is critical for later adult health outcomes. Making the case for investing in ECE in Serbia. Child's first 5 years hold key to success.