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Raising Voices to Make Every Kid Count

The Economic Benefits of Investing in Early Learning

What do the following people have in common?

- **Ben Bernanke,** Federal Reserve Chairman
- **James Heckman,** 2000 Nobel Laureate in Economics, University of Chicago
- **Barack Obama,** President of the United States
- **Bill Gates,** CEO, Microsoft
- **Charles Kolb,** President, Committee for Economic Development, Washington, D.C.
- **George Kaiser,** President & CEO, Kaiser-Francis Oil Company
- **Robert Dugger,** Managing Director, Tudor Investment Corporation
- **Art Rolnick,** Federal Reserve Bank of Minneapolis
- **Edward Flynn,** Milwaukee Police Chief
- **Jeff Joerres,** CEO of Manpower, Inc.
- **Jon Stellmacher,** Vice President, Thrivent Financial for Lutherans and founding member, Partnership for Wisconsin's Economic Success

These individuals all believe research has demonstrated the benefits of investing in well-designed early education programs to ensure optimal learning and development.

Why is there such an unusual consensus about the effectiveness of high-quality early learning programs from these leaders in business, economics, law enforcement, and government? The answer has a lot to do with scientific evidence about brain development and the effectiveness of early childhood intervention efforts.

Brain Development and the Importance of the First Five Years

A major contributing factor in this growing consensus is the body of scientific findings on early brain development. Over the last 40 years, researchers have documented the astonishing development of the brain in the first five years. A comprehensive analysis of the research on early development by the National Research Council in 2000, *From Neurons to Neighborhoods: The Science of Early Childhood Development*, has helped transform understanding of the importance of the early years. Key findings included:

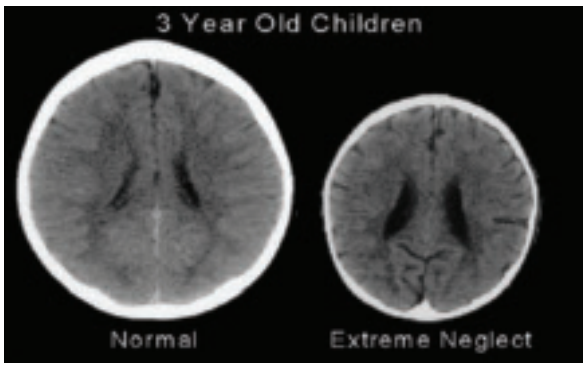
- All children are born ready to learn.
- Early environments and nurturing relationships are essential.
- Society is changing and the needs of young children are not being adequately addressed.[1]

The human brain develops more rapidly between birth and age 5 than during any other subsequent period.

The National Research Council found that from birth to age 5, children rapidly develop capabilities that form the foundation for later development and learning. The Council found striking disparities in what children know and can do before they enter kindergarten, and concluded that redressing these disparities is critical if children are to be prepared for school and ultimately able to sustain economic independence. Experiences in first few years of a child will influence the way in which the brain grows—the way in which the brain is wired.

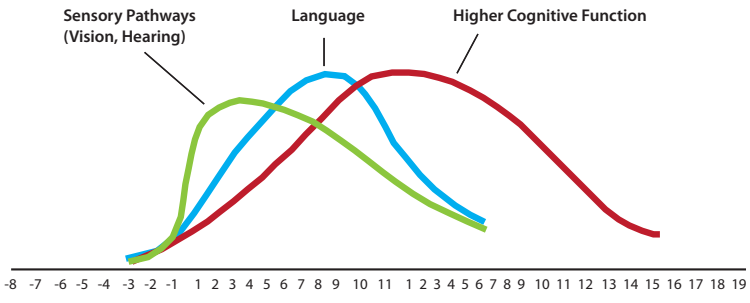
Brain development research was able to document the stunning difference between a brain with proper stimulation and one that has been deprived of sensory stimulation. Dr. Bruce Perry, an expert in brain development uses two images to illustrate the negative impact of neglect on the developing brain (see Figure 1). On the left is a brain image from a healthy 3-year-old with an average head size. The image on the right is from a 3-year-old child suffering from severe sensory-deprivation neglect. This child's brain is significantly smaller than average and has abnormal brain development.[2]

FIGURE 1



For children's brains to become highly developed for learning, repeated interactive experiences are essential. Early experiences determine whether or not a child's brain architecture provides a solid foundation for future learning and behavior. Figure 2, from *Neurons to Neighborhoods,* illustrates the remarkable early growth in synapse formation (connection among brain cells) related to sensory pathways (vision and hearing), language, and higher cognitive functioning—all dependent on early experiences.

FIGURE 2: **Human Brain Development**
Synapse Formation Dependent on Early Experience



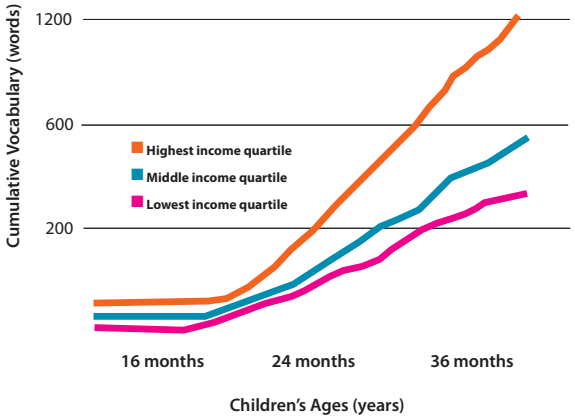
Source: Nelson (2000)

Language Development

Early exposure to rich language creates the foundation for a child's use and understanding of words, and increases the likelihood of eventual reading success.

Differences in language development, strongly associated with social and economic circumstances, can have a dramatic impact on school readiness. Figure 3 illustrates the gap that researchers Hart and Risley found in language development between children from low-income and professional families.[3]

FIGURE 3: **Disparities in Early Vocabulary Growth**



Source: Hart & Risley (1995)

The researchers found a 32 million words gap between the vocabularies 4-year-old children in professional families and families on welfare had been exposed to. Follow-up studies showed that these differences were largely eliminated, regardless of income status, if parents and caregivers used expressive, varied and rich language in their interactions with children.

Researchers Hart and Risley found that "extra talk"—where parents and other caregivers ask questions and use a large vocabulary to elaborate and extend what children are doing or saying—is strongly connected to emotional and social growth, and creates a positive relationship with the child. The richness of language children are exposed to appears to be a cornerstone of emotional, social and intellectual development.[4]

Research also confirms a strong correlation between vocabulary at age 3 and 11th grade reading levels. According to literacy expert Andrew Biemiller, "Vocabulary at age 3 predicts first grade reading success; first grade vocabulary predicts eleventh grade reading level."[5]

Social-Emotional Development

Research has also confirmed that brain development is not just about cognitive skills. Emotional and social development is also essential for healthy growth and learning. According to Harvard's Center on the Developing Child, "…emotional well-being, social competence, and emerging cognitive abilities are high inter-related, and together they are the bricks and mortar that comprise the foundation for human development."[6]

Child development experts believe that children's social-emotional development is essential to learning, and that the ability to form respectful relationships with peers and adults is a key to success in school and beyond. Developmental scientists have concluded that they cannot separate cognitive and emotional development within a child. Both are essential to learning and school readiness.

"Virtually every aspect of early human development, from the brain's evolving circuitry to the child's capacity for empathy, is affected by the environments and experiences that begin early in the prenatal period and extend throughout the early childhood years."
National Research Council, *From Neurons to Neighborhoods*

The scientific evidence on the importance of early experiences to brain development and school readiness has generated a new focus on early childhood programs designed for early learning.

Research on the Positive Effects of High-Quality Childhood Programs

The other key factor contributing to the growing consensus supporting early investments is the research on the impact of high-quality intervention programs. While the evidence that the first 5 years are extraordinarily important to a child's preparation for school and life is compelling, researchers have also sought the answer to these questions:

- Can early intervention significantly change outcomes for children?
- Can enriched early experiences change a child's readiness for school achievement?

An extensive body of evidence now confirms that well-designed early childhood programs can significantly improve outcomes for children, especially those from disadvantaged backgrounds. Furthermore, economic benefit-to-cost analyses find that spending on high-quality early learning is a high-yield investment.

"Investments in high-quality early education programs have the highest rate of return of any social investment."
James Heckman, University of Chicago Economist and Nobel Laureate, *Lessons from the Technology of Skill Formation,* 2005

Four very influential studies have had an enormous impact on the scientific world:

- The High/Scope Perry Preschool Project,
- The Abecedarian Project, and
- The Chicago Child-Parents Centers, and
- Nurse-Family Partnership Home Visiting Program.

These programs stand out because of their sound research design, the consistency of their findings, and the strong evidence they provide of the economic benefits of early investment. All four intervention programs targeted children from disadvantaged backgrounds, provided high-quality, well-designed programs, and three of them tracked children's outcomes into adulthood. While improved school readiness was an outcome for these programs, all of these approaches focused on the whole child, including social and emotional development, not just cognitive development.

High/Scope Perry Preschool Project

The Perry Preschool Project followed into adulthood low-income children who attended a high-quality half-day preschool with degreed teachers, a well-designed early learning program, and weekly home visits. The study

found that at age 40, individuals who had attended the program as children had higher earnings, were more likely to hold a job, had committed fewer crimes, and were more likely to have graduated from high school than adults who did not attend preschool.[7] A RAND Corporation Study found that the economic return was $17.07 for every dollar invested in the program.[8]

Figure 4 illustrates the difference in economic effects at age 27 for children who participated in the project and the control group that did not participate.[9]

FIGURE 4: **High/Scope Perry Preschool: Economic Effects at Age 27**

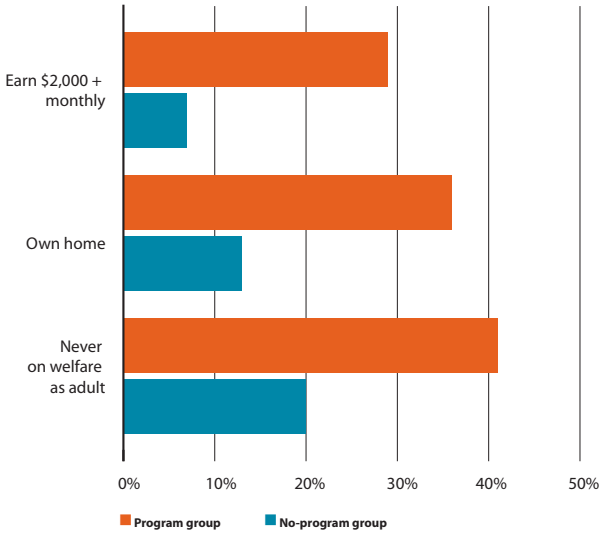
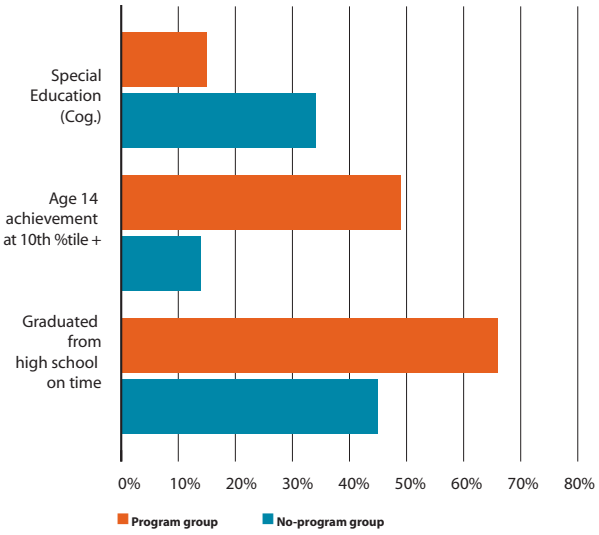


FIGURE 5: **Abecedarian : Academic Benefits**



The Abecedarian Project

The Abecedarian Project was a carefully controlled study of the effects of five years of exposure to high-quality early education in a child care setting. The study found that at age 21, those who participated had higher reading and math achievement scores, were twice as likely to still be in school, and were projected to have higher earnings over their lifetimes. The economic return, according to researchers at the National Institute for Early Education Research, was $3.60 for every dollar invested.[10]

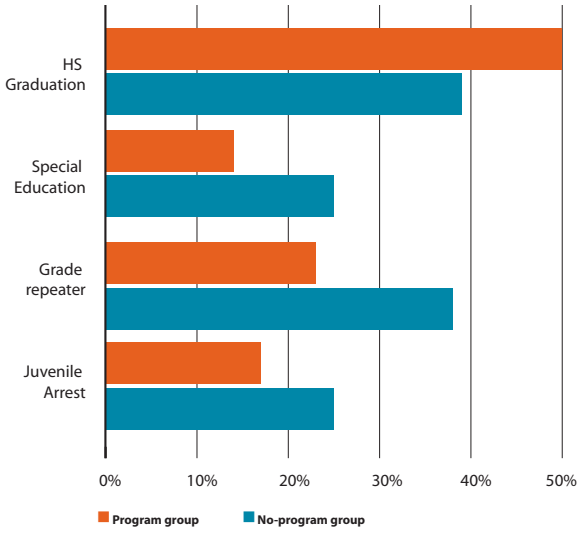
Figure 5 shows the difference in educational achievement levels between children who participated in the Abecedarian Project and those who did not.[11]

The Chicago Child-Parent Centers

This study, headed by Dr. Arthur Reynolds, then at the University of Wisconsin, followed 989 students enrolled in 20 Chicago Child-Parent Centers, along with a comparison group of 550 children who did not participate in the program. The study demonstrated that young children who receive high-quality early education do better in school academically, and are less likely to drop out of school, be arrested, repeat grades, or be placed in special education services. This study is especially significant because it was not a demonstration project mounted by university researchers, but rather a large government-run public school operation using primarily public funding (Title I education dollars). The economic return is estimated at $10.10 for every dollar invested.[12]

Figure 6 demonstrates the academic and social benefits at school exit for children who participated in the Child-Parent Centers, compared to those did not.[13]

FIGURE 6: **Chicago CPC: Academic and Social Benefits at School Exit**



Nurse Family Partnership Home Visiting Program

A growing body of research is finding positive outcomes from well-designed, evidence-based home visiting programs. The home visiting program with the strongest evidence of success is the model introduced by the Nurse Family Partnership, according to Harvard University's Center on the Developing Child.[14] This program provides home visits by trained nurses in the prenatal period followed by an intensive schedule of home visits that focus on enhancing child health and development through improvements in parenting and access to health care. As in the three preschool studies described above, these services are targeted to high-risk families. The economic return is estimated at $2.88 for every dollar invested.[15]

"The empirical evidence generated so far does support the efficacy of the model (home visiting) and its stated objectives with an increasing proportion of new parents."
Deborah Daro, Ph.D., *Home Visitation: Assessing Progress, Managing Expectations,* 2006.

Other home visiting programs are also showing positive results, according to the RAND Corporation's review of the evidence. In addition to the Nurse Family Partnership, RAND points to Healthy Families New York and Early Head Start as proven home visiting models, and to Parents and Teacher as a promising program.[16] These programs are designed to reach families facing barriers in supporting their child's healthy development, and provide information, guidance, and support in each family's home environment.

Five national organizations are working together to establish evidence-based practices: Nurse Family Partnership, National Center for Parents as Teachers, Healthy Families America, Home Instruction for Parents of Preschool Youngsters (HIPPY), and The Parent-Child Home Program.

Educare Early Returns: A Wisconsin Example

A 2009 study that evaluated the impacts of Educare programs in five states, including Wisconsin, found promising results. Educare programs are high-quality early care and education programs serving young children from low-income, distressed environments, similar to the population served by the Perry Preschool, Abecedarian, and Chicago Child Parent Center intervention programs.

The early data from Educare programs in five cities—Chicago, Denver, Milwaukee, Omaha, and Tulsa—show promising results for later academic success. School readiness scores of Educare children entering school were very close to national average scores, nearly ***eliminating any school readiness gap.*** Typically, children from disadvantaged backgrounds score well below national averages on measures of school readiness.

The study was done by the Frank Porter Graham Child Development Institute at the University of North Carolina-Chapel Hill.[17]

Why Did These Intervention Programs Work?

1. Early Education Programs

Ellen Galinsky, a leading authority on work-life issues, examined why the three most famous studies of high-quality early education programs showed such remarkable and enduring effects. To dig beneath the formal study findings, she interviewed the lead researchers, Larry Schweinhart of the Perry Preschool Project; Craig and Sharon Ramey of the Abecedarian Project; and Arthur Reynolds of the Chicago Child-Parent Centers program. She found there were several common features of these successful programs:

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

- They maintained small class sizes and high teacher-child ratios.
- They were intensive programs.
- These interventions focused on the whole child—intellectual, social, emotional and physical growth and well-being.
- Relationships between teachers and children were seen as central to learning.
- The children were viewed as active and experiential learners.[18]

Overall, it appears that the children in these programs gained confidence and competencies to succeed. As Larry Schweinhart said, "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."

"Early learning begets later learning and early success breeds later success."
James Heckman, Nobel Laureate in Economic Sciences, 2000

2. Home Visiting

The theory behind home visiting, supported by research data, is that getting parents off to a good start in their relationship with their infant is important for the infant's robust development. Findings from evaluations of several national home visiting models gathered over 10 years have indicated that well-designed home visiting programs lead to:

- increased school readiness;
- improved child health and development;
- reduced abuse and neglect; and
- enhanced ability of parents to support their children's overall development.[19]

Deborah Daro, a Research Fellow at Chapin Hall Center for Children at the University of Chicago, has done extensive analysis of home visiting programs, tracking research and practice in the field over time. From her analysis, Daro has drawn 12 critical elements of successful home visiting programs that are effective in fostering healthy development and preventing child abuse.[20] Key elements for success include starting service early (prenatal or at birth), intensive services, training and supervision of home visitors, and use of standardized assessment tools to identify families most in need of services. Building evidence-based best practices is strengthening home visiting services nationwide and in Wisconsin.

Return on Investment

The evidence of the economic benefits from the four major early childhood interventions discussed in this paper is compelling. In contrast to other economic development investments, early childhood interventions can yield remarkable economic returns that grow over time through cumulative benefits.

Below is a table summarizing the benefit-to-cost ratios of four of the most prominent programs in the field.

Program	Cost	Benefits	Benefit/ Cost Ratio
High/Scope Perry Preschool	$15,538	$262,642	**17.1**
Abecedarian Project	$35,864	$130,666	**3.6**
Chicago Child-Parent Centers	$7,384	$74,981	**10.1**
Nurse-Family Partnership	$9,118	$26,298	**2.9**

Economists indicate that the Perry Preschool program has particularly high return on investment, partly because this study has followed the children the longest - up to age 40. There appears to be a cumulative effect over time.

Economist Robert Lynch's Cost-Benefit Analysis

In a book published by the Economic Policy Institute in 2007, economist Robert Lynch took the cost-benefit research into consideration in calculating the likely impact of public investment in high-quality early childhood programs. He pointed to research putting return on investment in preschool education at 16 percent annually, outperforming the stock market's yearly average gain of 6 percent. Lynch's report measured investments in both targeted and universal early education programs for 3- and 4-year-olds. He used the Chicago Child-Parent Center program as his model for what the preschool program would look like.

According to Lynch, if Wisconsin invested in programs following the Chicago model, and targeted services to the 25 percent of Wisconsin children with the most need, the benefits would exceed $5 billion in 2050—a benefit more than 13 times that of the annual investment. Benefits from investment in *universal* preschool education would be about 9.5 times the investment, according to Lynch's calculations.

Lynch estimates benefits resulting from lower K-12 expenses stemming from reduced special education costs; lower juvenile and adult crime rates; lower child welfare expenditures; and greater tax revenue generated by higher work rates and higher incomes. While Lynch acknowledges that his estimates may not be precise, his assumptions appear to be conservative and he believes he is in the right ballpark.

"Dollars invested in early childhood development yield extraordinary public returns."
Art Rolnick and Rob Grunewald, Federal Reserve Bank of Minneapolis

Federal Reserve Bank of Minneapolis

Top officials of the Federal Reserve Bank of Minneapolis have also weighed in on the effectiveness of investing in early childhood development. Senior Vice President Art Rolnick and Regional Economic Analyst Rob Grunewald argue that compared to most state and local government investments, well-focused investments in early childhood development yield high public as well as private returns. They believe that early childhood development investments should be at or near the top on any list of economic development strategies.[23]

Grunewald and Rolnick are aware that it may be difficult to precisely replicate the very high returns that key studies have shown, but they still believe investing in early development is sound, with excellent returns. Grunewald, in a March 31, 2009 National Public Radio interview, indicated that while the Chicago Child-Parent project showed benefits as high as $10 or more per dollar invested, he thought a more conservative estimate might be more in the range of $4 to $5—still a very impressive return on investment.

It is important to recognize that it is difficult to replicate all the features of a carefully controlled study when first implementing a program on a larger scale. States should be cautious about expecting their initiatives to instantly provide the remarkable benefit-to-cost ratios the most successful intervention studies have shown; however, even returns on investment half that size would be significant.

Implications for Wisconsin Public Policy

An examination of the evidence demonstrates:

- the importance of early learning in the first 5 years;
- the positive outcomes of high-quality early intervention programs, especially when they are targeted to children at risk; and
- the return on investment that can be realized from early investments.

These findings have a number of implications for public policy in Wisconsin:

1. Science Should Drive Public Policy: Research evidence on what works and which investments bring the greatest return should drive state policy. Impressive evidence leads to a clear conclusion: The benefits of wise investments in young children are substantial, and the consequences of failing to invest early are likely to be costly.

2. Early Investments Work: While we may not know exactly how to replicate the promising results produced by the intervention programs reviewed in this paper, we know that well-designed, high-quality early childhood development programs work, generating impressive short- and long-term benefits.

3. We Know the Key Program Features That Lead to Desired Outcomes: We know from the research what program features and models result in strong positive outcomes. We have a solid roadmap of the critical features of early childhood education programs and home visiting programs.

Scientific findings have produced a paradigm shift. We now know that early development is extraordinarily important, and early investment can be remarkably cost-effective. Based on the evidence, Wisconsin should engage in a comprehensive effort to build a system of high-quality early childhood services. The Governor's State Advisory Council on Early Care and Education could play a key role in envisioning long-term goals and establishing realistic objectives for early care and education and for home visiting.

Investing strategically in early childhood development, with particular focus on children from disadvantaged backgrounds, is a wise investment in Wisconsin's future. ■

We should invest public resources in our young children, not only because they will be more productive citizens later, but also because it says something about the value we place on the quality of their lives as an important goal in its own right.
Jack Shonkoff, *Science, Policy and the Young Developing Child*

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