

Early Childhood Development: Economic Development with a High Public Return

Art Rolnick

Senior Vice President and Director of Research

Rob Grunewald

Regional Economic Analyst

Federal Reserve Bank of Minneapolis

Note: The following paper was developed in March 2003 with Minnesota audiences in mind. However, the authors subsequently discovered a high degree of interest throughout the country in their research on the economics of early childhood development and the universality of the issues discussed. This paper also motivated the October conference at the Minneapolis Fed.

Early childhood development programs are rarely portrayed as economic development initiatives, and we think that is a mistake. Such programs, if they appear at all, are at the bottom of the economic development lists for state and local governments. They should be at the top. Most of the numerous projects and initiatives that state and local governments fund in the name of creating new private businesses and new jobs result in few public benefits. In contrast, studies find that well-focused investments in early childhood development yield high public as well as private returns.

Why the case for publicly subsidizing private businesses is flawed and misguided

Over the last few years, the future of Minnesota's economy has been called into question. The resulting debate illustrates how little is understood about the fundamentals that underlie economic development. While many recognize the success of the Minnesota economy in the past, they see a weakening in the foundations of that success. Some point to the decline in corporate headquarters located in Minnesota. Some point to the lack of funding for new startup companies, particularly in the areas of high-tech and biotech. Some point to the possible loss of professional sports teams. Some think the

University of Minnesota is not visible enough in the business community. And still others raise the broader concern that Minnesota's citizens and policymakers have become too complacent and unwilling to make the public commitment to be competitive in a global economy.

Those who raise these concerns conclude that Minnesota and local governments need to take a more active role in promoting our economy. Often that implies that the state or local governments subsidize private activities that the market is not funding. Proponents of this view argue that without such subsidies, either well-deserving businesses will not get funded or other states will lure our businesses to greener pastures.

State and local subsidies to private businesses are not new. In the name of economic development and creating new jobs, Minnesota, and virtually every other state in the union, has a long history of subsidizing private businesses. We have argued in previous studies that the case for these subsidies is short-sighted and fundamentally flawed.¹ From a national perspective, jobs are not created—they are only relocated. From a state and local perspective, the economic gains are suspect because many would have been realized without the subsidies. In summary, what often passes for economic development and sound public investment is neither.

If subsidizing private businesses is the wrong way to promote Minnesota's economy, then what is the right way?

To answer this question, we need to understand that unfettered markets generally allocate scarce resources to their most productive use. Consequently, governments should only intervene in markets when they fail.

Market failures can occur for a variety of reasons; two well-documented failures are goods that have external effects and those with public attributes. Unfettered markets will generally produce the wrong amount of such goods. Education has long

been recognized as a good that has external effects and public attributes. Without public support, the market will yield too few educated workers and too little basic research. This problem has long been understood in the United States and it is why our government, at all levels, has supported public funding for education. (According to the Organization for Economic Cooperation and Development, for example, the United States in 1999 ranked high on public funding of higher education.²) Nevertheless, recent studies suggest that one critical form of education, early childhood development, or ECD, is grossly underfunded. However, if properly funded and managed, investment in ECD yields an extraordinary return, far exceeding the return on most investments, private or public.

A convincing economic case for publicly subsidizing education has been around for years and is well supported. The economic case for investing in ECD is more recent and deserves more attention.

Public funding of education has deep roots in U.S. history. John Adams, the author of the oldest functioning written constitution in the world, the constitution of the Commonwealth of Massachusetts, 1779, declared in that document that a fundamental duty of government is to provide for education.³ Publicly funded schools have been educating children in the United States ever since. Today over 85 percent of U.S. children are educated in publicly funded schools. John Adams argued for public funding of education because he realized the importance of educated voters to the well-being of a democracy. We suspect that he also understood the economic benefits that flow to the general public.

Investment in human capital breeds economic success not only for those being educated, but also for the overall economy. Clearly today, the market return to education is sending a strong signal. Prior to 1983, the wages of a worker with an undergraduate degree exceeded a worker with a high school degree by roughly 40 percent. Currently, that difference is close to 60 percent. The wage premium for an advanced degree has grown even more. Prior to 1985, the wages of a worker with a graduate degree exceeded those of a worker with a high school degree by roughly 60 percent. Today, that difference is over 100 percent.

Minnesota represents a good example of the economic benefits that flow from education. Evidence is clear that our state has one of the most successful economies in the country because it has one of the most educated workforces. In 2000, almost a third of persons 25 and older in Minnesota held at least a bachelor's degree, the sixth highest state in the nation. To ensure the future success of Minnesota's economy, we must continue to provide a highly educated workforce.

The economic case for public funding of early childhood development

Knowing that we need a highly educated workforce, however, does not tell us where to invest limited public resources. Policymakers must identify the educational investments that yield the highest public returns. Here the literature is clear: Dollars invested in ECD yield extraordinary public returns.

The quality of life for a child and the contributions the child makes to society as an adult can be traced back to the first few years of life. From birth until about 5 years old a child undergoes tremendous growth and change. If this period of life includes support for growth in cognition, language, motor skills, adaptive skills and social-emotional functioning, the child is more likely to succeed in school and later contribute to society.⁴ However, without support during these early years, a child is more likely to drop out of school, receive welfare benefits and commit crime.

A well-managed and well-funded early childhood development program, or ECDP, provides such support. Current ECDPs include home visits as well as center-based programs to supplement and enhance the ability of parents to provide a solid foundation for their children. Some have been initiated on a large scale, such as federally funded Head Start, while other small-scale model programs have been implemented locally, sometimes with relatively high levels of funding per participant.

The question we address is whether the current funding of ECDPs is high enough. We make the case that it is not, and that the benefits achieved from ECDPs far exceed their costs. Indeed, we find that the return to ECDPs far exceeds the return on most projects that are currently funded as economic development.

Many of the initial studies of ECDPs found little improvement; in particular, they found only short-term improvements in cognitive test scores. Often children in early childhood programs would post improvements in IQ relative to nonparticipants, only to see the IQs of nonparticipants catch up within a few years.⁵

However, later studies found more long-term effects of ECDPs. One often-cited research project is the High/Scope study of the Perry Preschool in Ypsilanti, Mich., which demonstrates that the returns available to an investment in a high-quality ECDP are significant. During the 1960s the Perry School program provided a daily 2 1/2-hour classroom session for 3- to 4-year-old children on weekday mornings and a 1 1/2-hour home visit to each mother and child on weekday afternoons. Teachers were certified to teach in elementary, early childhood and special education, and were paid 10 percent above the local public school district's standard pay scale. During the annual 30-week program, about one teacher was on staff for every six children.⁶

Beginning in 1962, researchers tracked the performance of children from low-income black families who completed the Perry School program and compared the results to a control group of children who did not participate. The research project provided reliable longitudinal data on participants and members of the control group. At age 27, 117 of the original 123 subjects were located and interviewed.⁷

The results of the research were significant despite the fact that, as in several other studies, program participants lost their advantage in IQ scores over nonparticipants within a few years after completing the program. Therefore a significant contribution to the program's success likely derived from growth in noncognitive areas involving social-emotional functioning. During elementary and secondary school, Perry School participants were less likely to be placed in a special education program and had a significantly higher average achievement score at age 14 than nonparticipants. Over 65 percent of program participants graduated from regular high school compared with 45 percent of nonparticipants. At age 27, four times as many program participants as nonparticipants earned \$2,000 or more per month. And only one-fifth as many program participants as nonparticipants were arrested five or more times by age 27.⁸

Perry School Preschool's Estimated Impact per Program Participant

Table 1A Benefit/Cost Analysis

	Present Value in 1992 Dollars Discounted at 3%		
Benefits*	For Participant	For Public	Total
Child care provided	738	0	738
More efficient K-12 education, such as less grade retention and higher achievement	0	6,872	6,872
Decrease in public adult education costs	0	283	283
Increase in participants' earnings and employee benefits	21,485	8,846	30,331
Decrease in crime	0	70,381	70,381
Increase in publicly funded higher education costs	0	-868	-868
Decrease in welfare payments	-2,653	2,918	265
Total Benefits	19,570	88,433	108,002
Cost of Program	0	-12,356	-12,356
Estimated return on \$1 invested in program:			
For Participant and Public:	\$8.74 (\$108,002 in Benefits/\$12,356 for Cost of Program)		
For Public:	\$7.16 (\$88,433 in Benefits/\$12,356 for Cost of Program)		

* Benefits and costs were measured from ages 3 through 27 and projected for ages 28 through 65.

Data source: *The High/Scope Perry Preschool Study Through Age 27*

Other studies of ECDPs, while not solely focused on 3- to 4-year-old children, also show improvements in scholastic achievement and less crime. For example, the Syracuse Preschool Program provided support for disadvantaged children from prenatal care through age 5. Ten years later, problems with probation and criminal offenses were 70 percent less among participants compared with a control group.⁹

As the result of the Abecedarian Project in North Carolina, which provided children from low-income families a full-time, high-quality educational experience from infancy through age 5, academic achievement in both reading and math was higher for program participants relative to nonpar-

Perry School Preschool's Estimated Impact per Program Participant

Table 1B Real Internal Rate of Return*

Benefits**		Average Annual Effect in 1992 Dollars		
		For Participant	For Public	Total
Child care provided	(Ages 3-4)	385	0	385
More efficient K-12 education	(Ages 5-17)	0	747	747
Decrease in public adult education services	(Ages 20-25)	0	89	89
Increase in participants' earnings and employee benefits	(Ages 18-27)	2,142	714	2,856
	(Ages 28-65)	1,070	357	1,427
Decrease in crime	(Ages 18-27)	0	8,923	8,923
	(Ages 28-65)	0	1,565	1,565
Increase in publicly funded higher education costs	(Ages 20-25)	0	-225	-225
Decrease in welfare payments	(Ages 18-27)	-392	431	39
	(Ages 28-65)	-31	34	3
Cost of program	(Ages 3-4)	0	-6,444	-6,444
Estimated Real Internal Rate of Return		4%	12%	16%

* The internal rate of return is the interest rate received for an investment that consists of payments and revenue occurring at regular periods. The above amounts were allocated annually across the age groups listed.

** Benefits and costs were measured from ages 3 through 27 and projected for ages 28 through 65.

Data source: *The High/Scope Perry Preschool Study Through Age 27*

participants into young adulthood. Furthermore, participants had fewer incidences of grade retention and special education placements by age 15.¹⁰

The High/Scope study conducted a benefit-cost analysis by converting the benefits and costs found in the study into monetary values in constant 1992 dollars discounted annually at 3 percent. The researchers found that for every dollar invested in the program during the early 1960s, over \$8 in benefits was returned to the program participants and society as a whole (see Table 1A).

While 8-to-1 is an impressive benefit-to-cost ratio, policymakers should place this result in context with returns from other economic develop-

ment projects. Perhaps another project can boast a higher benefit-to-cost ratio. Unfortunately, well-grounded benefit-to-cost ratios are seldom computed for public projects. However, an alternative measure—the internal rate of return—can be used to more easily compare the public, as well as private, return to investments. (The internal rate of return is the interest rate received for an investment consisting of payments and revenue that occur at regular periods.)

To calculate the internal rate of return for the Perry School program, we estimated the time periods in which costs and benefits in constant dollars were paid or received by program participants and society (see Table 1B). We estimate the real internal rate of return for the Perry School program at 16 percent. “Real” indicates that the rate of return is adjusted for inflation.

While program participants directly benefited from their increase in after-tax earnings and fringe benefits, these benefits were smaller than those gained by the general public. Based on present value estimates, about 80 percent of the benefits went to the general public (students were less disruptive in class and went on to commit fewer crimes), yielding over a 12 percent internal rate of return for society in general. Compared with other public investments, and even those in the private sector, an ECDP seems like a good buy. This analysis suggests that early childhood development is underfunded; otherwise, the internal rate of return on an ECDP would be comparable to other public investments.

As with virtually all studies, there are caveats to the High/Scope findings. On the one hand, the High/Scope study may overstate the results we could achieve today. Problems facing children 30 years ago were different from the problems facing children today. Single parenthood, parental drug use, neighborhood crime are higher in many areas of the country than they were 30 years ago. Therefore, the rate of return of an ECDP today may be lower than the Perry School program.

Furthermore, in reviewing our method of calculating the internal rate of return, one could argue that some of the payments and revenue streams assigned should have started or ended in different years, or that assigning an even distribution distorts the actual payments and revenue made. Nevertheless, we find that the final result holds,

even when payments and revenue are adjusted to a more conservative distribution.

On the other hand, the High/Scope study may understate the results we could achieve today. First, the High/Scope study doesn't measure positive effects on children born to participant families after the study period. The knowledge gained by parents participating in the program likely transferred to their younger children. Second, the study may further understate the effects because it doesn't take into account effects on future generations. With increased education and earnings, participants' children would be less likely to commit crime and more likely to achieve higher levels of education and income than if their parents hadn't attended the Perry School program. A chain of poverty may have been broken.

The returns to ECDPs are especially high when placed next to other spending by governments made in the name of economic development. Yet ECD is rarely considered as an economic development measure.

For example, tax increment financing and other subsidies have recently been used to locate a discount retail store and an entertainment center in downtown Minneapolis, and to relocate a major corporate headquarters to suburban Richfield and a computer software firm to downtown St. Paul. Can any of these projects, which combined represent an estimated quarter of a billion dollars in public subsidies, stand up to a 12 percent public return on investment? From the state's point of view, if the subsidy is simply moving businesses within the state, the public return is zero. If the subsidy is required for the business to survive, the risk-adjusted public return is not merely small but could be negative.

As our lawmakers review proposals to build or improve the state's major professional sports stadiums, let's not make the same mistake. The various proposals to build new baseball and football stadiums and improve the current basketball stadium total over \$1 billion. Can new stadiums offer a comparable public return on investment as an ECDP? How does a new stadium reduce crime, increase earnings and potentially break a chain of poverty? We propose that this \$1 billion plus be invested in a project with a much higher public return.

Proposal: Minnesota Foundation for Early Childhood Development

Our proposal—to create a foundation for early childhood development in Minnesota—isn't born in a vacuum. For several years the state of Minnesota has sponsored initiatives to help prepare children for kindergarten, specifically, Early Childhood Family Education, or ECFE, School Readiness and state-funded Head Start programs. These programs often work together in supporting early childhood development.

ECFE provides support to parents and their children from birth until kindergarten enrollment to promote the healthy growth and development of children. The program offers classes for parents and

Table 2 Cost Estimate to Educate all 3- and 4-Year-Old Children from Low-Income Families in Minnesota at a Two-Year, High-Quality ECDP

Annual cost of program

Number of 3- and 4-year-old children living in poverty*	20,000
Cost per child**	\$ 9,500
Total	\$ 190,000,000

Current funds available

Federal and state annual funds for Head Start (Serves about 13,300 children at an annual cost of \$5,750 per child)	\$ 80,000,000
School Readiness (Estimate that 30 percent of children participating in the program live in poverty)	\$ 3,000,000
Early Childhood Family Education (Estimate of amount currently spent on 3- and 4-year-old children who live in poverty)	\$ 2,000,000
Total	\$ 85,000,000
Total annual need (Cost—Current funds available)	\$ 105,000,000
\$1.5 billion endowment invested in AAA corporate bonds yielding an average 7 percent annual return	\$ 105,000,000

* Based on statistics from the Minnesota Department of Children, Families & Learning

** Estimate based on Perry School program

children, and provides optional home visits. About \$20 million in state aid was allocated to ECFE in 2001, which supported programs for more than 300,000 parents and children.¹¹

Between the ages of 3 1/2 to 5 years, children can participate in School Readiness programs that provide a wide array of prekindergarten activities in collaboration with other early childhood and community programs. Funding for School Readiness was about \$10 million in 2001 and reached 43,030 children.¹²

The state of Minnesota also allocated almost \$19 million to supplement federal funding (\$59 million) for Head Start programs in 2000, with about 13,300 children and their families participating in comprehensive education, health and social services. However, according to a state report, only 45 percent of eligible children and their families received Head Start services. Some of these eligible children between the ages of 3 1/2 to 5 years who didn't receive help from Head Start participated in School Readiness programs.¹³ However, it is unlikely that participation of high-needs children in a lower-cost, less comprehensive program demonstrated the returns available in a part- to full-day, long-term program.

We propose that the Minnesota state government create the Minnesota Foundation for Early Childhood Development to fill the gap between the funds currently available for ECFE, School Readiness and Head Start and the amount necessary to fully fund a high-quality program for all 3- and 4-year-old children living in poverty in Minnesota. A one-time \$1.5 billion outlay would create an endowment that could support ECDPs on an annual basis. The foundation would receive donations from government, private foundations, individuals and businesses. With the foundation's funds invested in corporate AAA bonds, earning about 7 percent per year, we estimate that the \$105 million in annual earnings would cover the yearly costs required to fully fund comprehensive, high-quality ECDPs for all children from low-income families in Minnesota (see Table 2).

The Minnesota Foundation for Early Childhood Development would provide funding for well-supported and highly effective ECDPs, whether supplementing funds for an existing Head Start center or helping start a new program. The Foundation

would provide additional resources to enhance existing programs, such as boost teacher qualification and compensation, reduce teacher-student ratios and expand curriculum resources. Furthermore, the Foundation would provide start-up funds for new ECDPs to help reach all eligible children.

We contend that funding for ECDPs should reach the level of model program status, such as the Perry School program, since this is the level at which high returns have been demonstrated. Well-funded ECDPs would ensure that all teachers have a degree in early childhood education and are paid at a level that keeps turnover to a minimum. Furthermore, ECDPs would maintain low student-to-teacher ratios and use high-quality curriculum materials. Funds should also be allocated for research to track the improvement of participating children and identify where additional support may be needed. Participation in these programs should be voluntary, but incentives may be provided for families to participate. ECDPs should work effectively with parents and include them in the education process with their children.

Conclusion

The conventional view of economic development typically includes company headquarters, office towers, entertainment centers, and professional sports stadiums and arenas. In this paper, we have argued that in the future any proposed economic development list should have early childhood development at the top. The return on investment from early childhood development is extraordinary, resulting in better working public schools, more educated workers and less crime. A \$1.5 billion investment to create the Minnesota Foundation for Early Childhood Development would go a long way toward ensuring that children from low-income families are ready to learn by the time they reach kindergarten.

Granted that in today's tight fiscal environment, \$1.5 billion is a particularly large sum, which may mean we can't fully fund the program immediately. But we should be able to fully fund the endowment over the next five years. After measuring the public impact on the quality of life that such a foundation can provide, the costs of not making such an investment are just too great to ignore. ■

ENDNOTES

- ¹ Melvin Burstein & Arthur Rolnick, "Congress Should End the Economic War Among the States: Federal Reserve Bank of Minneapolis Annual Report Essay," *The Region* 9, no. 1 (March 1995), 3-4.
- ² "The Ruin of Britain's Universities," *The Economist* 365, No. 8299 (16 Nov. 2002), 51.
- ³ David McCullough, *John Adams* (New York: Simon & Schuster, 2001), 222-225.
- ⁴ Martha Farrell Erickson & Karen Kurz-Riemer, *Infants, Toddlers and Families: A Framework for Support and Intervention* (New York: The Guilford Press, 1999), 19.
- ⁵ Dale C. Farran, "Another Decade of Intervention for Children Who Are Low Income or Disabled: What Do We Know Now?" in *Handbook of Early Childhood Intervention*, ed. Jack P. Shonkoff and Samuel J. Meisels (Cambridge University Press, 2000), 511-512.
- ⁶ Lawrence J. Schweinhart, Significant Benefits: *The High/Scope Perry Preschool Study Through Age 27* (Ypsilanti, Michigan: High/Scope Press, 1993), 32.
- ⁷ Dale C. Farran, "Another Decade of Intervention for Children Who Are Low Income or Disabled: What Do We Know Now?" in *Handbook of Early Childhood Intervention*, ed. Jack P. Shonkoff and Samuel J. Meisels (Cambridge University Press, 2000), 516.
- ⁸ Lawrence J. Schweinhart, Significant Benefits: *The High/Scope Perry Preschool Study Through Age 27* (Ypsilanti, Michigan: High/Scope Press, 1993), xv, 55.
- ⁹ James J. Heckman and Pedro Carneiro, "Human Capital Policy," working paper, University of Chicago, August 2002.
- ¹⁰ Dale C. Farran, "Another Decade of Intervention for Children Who Are Low Income or Disabled: What Do We Know Now?" in *Handbook of Early Childhood Intervention*, ed. Jack P. Shonkoff and Samuel J. Meisels (Cambridge University Press, 2000), 513-515.
- ¹¹ *Early Childhood and Family Support* [online], Minnesota Department of Children, Families & Learning Web Site [cited December 2002], available from World Wide Web: (<http://cfl.state.mn.us/ecfi/>).
- ¹² Ibid.
- ¹³ Ibid.

BIBLIOGRAPHY

- Burstein, Melvin and Arthur Rolnick. "Congress Should End the Economic War Among the States: Federal Reserve Bank of Minneapolis Annual Report Essay." *The Region* 9, no. 1 (March 1995): 3-20.
- Currie, Janet. "Early Childhood Education Programs." *Journal of Economic Perspectives* 15, no. 2 (Spring 2001): 213-238.
- Currie, Janet, Eliana Garces, and Duncan Thomas. "Longer-Term Effects of Head Start." *The American Economic Review* (September 2000): 999-1012.
- Erickson, Martha Farrell and Karen Kurz-Riemer. *Infants, Toddlers and Families: A Framework for Support and Intervention*. New York: The Guilford Press, 1999.
- Farran, Dale C. "Another Decade of Intervention for Children Who Are Low Income or Disabled: What Do We Know Now?" In *Handbook of Early Childhood Intervention*, edited by Jack P. Shonkoff and Samuel J. Meisels, 510-548. Cambridge University Press, 2000.
- "Head Start in Minnesota: Minnesota Head Start Annual Report," January 2000.
- Heckman, James J. and Pedro Carneiro. "Human Capital Policy." Working paper, University of Chicago, August 2002.
- McCullough, David. *John Adams*. New York: Simon & Schuster, 2001.
- Early Childhood and Family Support* [online]. Minnesota Department of Children, Families & Learning Web Site [cited December 2002]. Available from World Wide Web: (<http://cfl.state.mn.us/ecfi/>)
- "Preschool for All: Investing in a Productive and Just Society." A statement by the Research and Policy Committee of the Committee for Economic Development, 2002.
- "The Ruin of Britain's Universities." *The Economist* 365, no. 8299 (16 Nov. 2002): 51-52.
- Schweinhart, Lawrence J. *Significant Benefits: The High/Scope Perry Preschool Study Through Age 27*. Ypsilanti, Michigan: High/Scope Press, 1993.
- U.S. Department of Education. "Building Strong Foundations for Early Learning." *Guide to High-Quality Early Childhood Education Programs* (November 2000).