

**Achieving a High Return on
Early Childhood Investment:
Evidence, Proposal, and the Minnesota Pilot**

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Summary

For well over 20 years, government leaders at the state and local levels have invested in economic development schemes with public dollars that are at best a zero-sum game. In the name of economic development and creating new jobs, virtually every state in the union has tried to lure companies with public subsidies. Studies have shown that the case for these so-called bidding wars is shortsighted and fundamentally flawed. From a national perspective, jobs are not created—they are only relocated. The public return is at most zero.

We don't pretend to have all the answers to economic development, but we're quite certain that investing in early childhood education is more likely to create a vibrant economy than using public funds to lure a sports team by building a new stadium or attracting an automaker by providing tax breaks. First, a child's first few years are a sensitive period for brain development and set a trajectory for his or her success in school and later in life. Second, a series of longitudinal studies shows that well-focused and funded investments in early childhood development programs produce substantial returns for children from disadvantaged environments.

The findings from early childhood research, promising though they are, pose a challenge: How can we reproduce the success of model early childhood development programs on a large scale? We believe that large-scale efforts can succeed if they are market based and incorporate the following key attributes: start early, involve parents, focus on at-risk children, provide incentives for quality programs, and make a long-term commitment.

In this paper, we first review the evidence on the potentially high return to early childhood investment. Second, we present our market-based proposal for achieving these returns on a large scale. Finally, we examine the Minnesota pilot that is designed to test the market-based approach.

Introduction

In comments to business leaders in Omaha, Neb., regarding income inequality in the United States, Federal Reserve Chairman Ben Bernanke said, “Although education and the acquisition of skills is a lifelong process, starting early in life is crucial. Recent research—some sponsored by the Federal Reserve Bank of Minneapolis in collaboration with the University of Minnesota—has documented the high returns that early childhood programs can pay in terms of subsequent educational attainment and in lower rates of social problems, such as teenage pregnancy and welfare dependency” (Bernanke, 2007).

The research cited by the chairman is contained in several papers we have written over the past four years on the economic benefits of investments in early childhood education. We have argued that investments in human capital prior to kindergarten provide a high public return. Such investments—especially for at-risk children—can have a substantial impact on the success of children’s futures as students, workers, and citizens in democratic society. That is, the most efficient means to boost the productivity of the workforce 15 to 20 years down the road is to invest in today’s youngest children. According to James Heckman, Nobel laureate economist at the University of Chicago, “Enriching the early years will promote the productivity of schools by giving teachers better-quality students. Improving the schools will in turn improve the quality of the workforce” (Heckman & Masterov, 2006).

The high returns to investments in early education accrue not only by boosting labor productivity, but also by reducing costs to society, such as remedial education and crime. Research shows that investments in high-quality early education appear to reduce future crime and are more cost effective than additional spending on police or incarceration (Heckman & Masterov, 2006). Aside from comparing returns on investment with other types of crime prevention and education spending, we contend that investing in early childhood development yields a much higher return than most government-funded economic development initiatives.

For well over 20 years, government leaders at the state and local levels have invested in economic development schemes with public dollars that are at best a zero-sum game. In the name of economic development and creating new jobs, virtually every state in the union has tried to lure companies with public subsidies. Studies have shown that the case for these so-called bidding wars is shortsighted and fundamentally flawed. From a national perspective, jobs are not created—they are only relocated. The public return is at most zero. And the economic gains that seem apparent at state and local levels are also suspect because they would likely have been realized without the subsidies. In other words, what often passes for economic development and sound public investment is neither.

In this paper, we first review the evidence on the potentially high return to early childhood investment. Second, we present our market-based proposal for achieving these returns on a large scale. Finally, we examine the Minnesota pilot that is designed to test the market-based approach.

Early Childhood Sets the Tone

We don't pretend to have all the answers to economic development, but we're quite certain that investing in early childhood education is more likely to create a vibrant economy than using public funds to lure a sports team by building a new stadium or attracting an automaker by providing tax breaks. First, a child's first few years are a sensitive period for brain development and set a trajectory for his or her success in school and later in life. Second, a series of longitudinal studies shows that well-focused and funded investments in early childhood development programs produce substantial returns for children from disadvantaged environments.

The quality of life and the contributions a person makes to society as an adult can be traced back to the first few years of life. If a child from birth through age 5 receives support for development in cognition, language, motor skills, adaptive skills, and social/emotional functioning, he or she is more likely to succeed in school and in the workplace (Erickson & Kurz-Riemer, 1999; Ramey et al., 2000). However, if a child doesn't have support for healthy development at an early age, the child is more at risk for negative outcomes, including dropping out of school, committing crime, and receiving welfare payments as an adult. Children who are exposed to stress from such conditions as living in poverty, having parents with chemical dependency or low levels of education, or suffering abuse or neglect are more likely than otherwise to enter kindergarten not prepared to succeed in school.

Research shows that a child's healthy brain development can be compromised due to excessive stress during the first few years. "Frequent or sustained activation of brain systems that respond to stress can lead to heightened vulnerability to a range of behavioral and physiological disorders over a lifetime. These undesirable outcomes can include a number of stress-related disorders affecting both mental and physical health" (National Scientific Council on the Developing Child, 2005).

Research on monkeys shows that stress during the fetal and neonatal periods can impair healthy development of the immune system. A young monkey's development can become permanently altered by disturbing pregnancy conditions and by major changes from normal maternal rearing (Coe & Lubach, 2004).

In Romania, thousands of children were being reared in institutions in which children were deprived stimulation, nutrition, and health care. Children adopted in the early 1990s before 6 months of age had higher cognitive function than children adopted in later years. Also, 6.5 years after adoption, children reared in Romanian orphanages for less than 9 months had lower cortisol levels over the daytime hours than did later adopted children (Gunnar et al., 2001).

Four key longitudinal evaluations demonstrate that early interventions can have a positive impact on young children from disadvantaged environments that lasts well into adulthood. The studies used well-matched comparison groups and cost-benefit analysis to compare the estimated dollar value of benefits to the cost of the programs. Analyses of the Perry Preschool Program (Schweinhart et al., 2005), the Abecedarian Project (Masse

& Barnett, 2002), the Chicago Child-Parent Centers (Reynolds, Temple, Robertson, & Mann, 2002), and the Elmira Prenatal/Early Infancy Project (Karoly et al. 1998) showed annual rates of return, adjusted for inflation, ranging between 7 percent to just over 20 percent (Heckman, Grunewald, & Reynolds, 2006). The Perry Preschool Program and Chicago Child-Parent Centers provided preschool at ages 3 and 4, Abecedarian provided full-day care and education for children a few months old through age 4, and the Elmira Prenatal/Early Infancy Project provided home visits by a nurse to high-risk mothers during pregnancy until the child turned age 2.

Key Ingredients

Results from the longitudinal studies and research from neuroscience and developmental psychology point to five key ingredients for investments in early childhood.

Starting early

Science shows that the prenatal and infancy period is a particularly sensitive period for brain development. As mentioned above, high-quality preschool beginning at age 3 shows a positive impact on school readiness, but for children with multiple risk factors, age 3 may be too late. Therefore, an effective mix of early childhood investments should span the prenatal period to age 5.

Quality

The training levels of staff via home visiting and center-based programs correlate with positive interactions between staff and children/parents (Espinosa, 2002). Relatively low ratios of children to teachers and research-backed curricula are also factors consistent with positive outcomes at center-based programs.

Parent involvement

The four longitudinal studies mentioned above include parent involvement, either through home visiting or connecting parents with activities at a center. Parents are their children's first and primary teachers. However, programs that focus exclusively on parents may not be as effective as a mix of parent-focused and center-based programs (Burr & Grunewald, 2006).

Reaching at-risk children

On a per child basis, reaching at-risk children will garner the highest return. While studies of state-sponsored universal preschool programs show that all children, regardless of risk factors, demonstrate gains in school readiness measures, children from disadvantaged environments show the largest gains.

Bring to scale

First, there are many low-income children who could benefit from early childhood investments based on waiting lists for Head Start and/or child care subsidies. To qualify for Head Start, a 3- or 4-year-old child must live in a family below the poverty level; only about 60 percent of children eligible in Minnesota are provided services through Head Start. To qualify for a child care subsidy, parents must demonstrate they are either

working, enrolled in an education program or actively searching for a job and earn less than 175 percent of poverty; over 3,000 families in Minnesota are on waiting lists. Furthermore, surveys of child care arrangements show that many children in low-income families use informal family, friend, and neighbor arrangements and that these settings tend to be lower quality compared with center-based programs (Brown-Lyons, Robertson, & Layzer, 2001).

Second, a large-scale early childhood system should operate as efficiently as possible. As we will argue below, large-scale programs that use a top-down, centralized approach are likely less efficient than a market-based system that empowers parents to make choices among high-quality public and private early childhood programs.

Types of Early Childhood Investments

Commonly discussed early childhood investments include home visiting, access to health care, high-quality child care, and preschool. Some investments include a combination of these components. For example, some Early Head Start sites, which provide services to parents and children beginning as early as prenatal until age 3, use a combination of home visiting and center-based programming and link families to health care services. Below we make observations regarding the literature for each investment type.

Home Visiting

Home visiting refers to programs that send a nurse, social worker, parent educator, or paraprofessional to the homes of parents who are expecting a child or have children ages 0 to 5. Information provided during home visits ranges from health and nutrition to early literacy. The goals of home visiting also vary, from health outcomes, such as healthy births, to reductions in abuse or neglect and improved school readiness. Reviews of home visiting programs include RAND's Web-based Promising Practices Network (RAND, 2007) and a review of public health nurse home visiting programs in *Public Health Nursing* (McNaughton, 2004).

One of the most cited studies of a home visiting model is the Nurse Family Partnership in which registered nurses visit the homes of at-risk, first-time mothers of children prenatal to age 2. Randomly selected participants were compared with a control group in Elmira, N.Y., Memphis, and Denver. Effects found in two or more trials include improved prenatal health, fewer subsequent pregnancies, increased intervals between births, fewer childhood injuries, improved school readiness, and increased maternal employment (Nurse Family Partnership, 2007). As indicated earlier, a cost-benefit analysis of the Elmira, N.Y., trial showed that the monetary value of benefits attributed to the program exceeded costs by a wide margin. The estimated annual rate of return, adjusted for inflation, was as high as 20 percent or more.

A study of the Healthy Family America (HFA) model in New York showed positive effects on reducing child abuse and neglect (Dumont et al., 2006). The treatment population includes expectant parents and parents with an infant less than 3 months of age who are considered to be at high risk for child abuse and neglect. Specially trained

paraprofessionals provide home visitation services until the child reaches age 5 or is enrolled in Head Start or kindergarten (RAND, 2007).

Studies of the HFA model were mixed. A meta-analysis conducted by the Washington State Institute for Public Policy (Aos et al., 2004) of interventions for families, young children, and youth estimated a benefit-cost ratio of less than 1 for HFA, suggesting that monetary benefits were less than costs. However, evidence from the New York study showed that impacts on serious abuse and neglect were concentrated among the “psychologically vulnerable.” Therefore, strong impacts of the model may be realized by prioritizing the populations served or by enhancing the model to meet program objectives for hard-to-serve families (Dumont et al., 2006).

Cincinnati’s Early Child Succeeds program incorporates aspects from both the Nurse Family Partnership and HFA in the development of its home visiting program. A study of the program’s impact on infant mortality showed that infants whose families did not receive home visiting were 2.5 times more likely to die in infancy compared with infants whose families received home visiting (Donovan et al., 2007).

RAND’s Promising Practices Network also includes a review of Parents as Teachers, which provides parent education for all families with children as early as prenatal to as late as age 5. The program was not included in RAND’s list of Proven Programs, which included the Nurse Family Partnership and New York HFA, but rather in its list of Promising Programs. The evaluations of Parents as Teachers had some methodological concerns, and results were mixed. RAND also noted that although some positive outcomes were found in higher-risk populations, the program’s success seems to be linked to the level and quality of parental participation. Therefore, families with lesser-risk levels had better results (RAND, 2007).

In conclusion, home visiting programs that target at-risk families and use relatively well-trained staff and intensive services are likely to garner the best results. The Nurse Family Partnership model costs about \$10,000 per family for almost 2 1/2 years of service, but has shown to produce benefits that more than pay back this amount (Nurse Family Partnership, 2007). New York HFA costs about \$3,000 to \$3,500 per family annually (Dumont et al., 2006). Well-trained visitors include registered nurses and professionals with training to deliver services to vulnerable families. At this point, research is not definitive on the base amount of services required to produce a positive impact, such as frequency and duration of visits.

Access to Health Care

The three longitudinal center-based studies mentioned above (Perry, Abecedarian, and Child-Parent Centers) were primarily focused on the impact of an enriched education setting on young children. Similar studies that track children into adulthood and use cost-benefit analysis have not been conducted on the impact of early health and nutrition interventions. Nevertheless, early health and nutritional deficits have been linked to health problems later (McCain & Mustard, 1999). A study based on data from the 1958 National Child Development Study in Britain shows that after accounting for parental

income, education, and social class, children who experience poor health have significantly lower educational attainment, poorer health, and lower social class as adults. “Childhood health and circumstance appear to operate both through their impact on initial adult health and economic status, and through a continuing direct effect of prenatal and childhood health in middle age” (Case, Fertig, & Paxson, 2005).

While cost-benefit analyses haven’t been conducted on controlled longitudinal experiments of early health interventions, it seems plausible that investments in early health could have substantial paybacks to individuals and society due to reduced health care costs. A recent presentation by Bernard Guyer of Johns Hopkins School of Public Health considers the potential cost savings due to reductions in early exposure to tobacco smoke, childhood obesity, mental health issues, and injuries. Private and public health costs due to these risks are substantial, and interventions that effectively reduce these risks are likely to reduce health costs (Guyer, 2007).

High-Quality Child Care

Quality child care can be viewed from two dimensions: quantity and level. First, many young children—over 75 percent—spend some time out of parental care so that their parents can work. Second, studies of child care quality often phrase their findings as “mediocre at best,” yet the quality of child care settings can have an impact on school readiness.

Two studies, one that examines child care in poor communities (Loeb, Fuller, Kagan, & Carrol, 2004) and a second that includes a more diverse sample (NICHD, 1999; 2000; 2004) both found that enrollment in center-based care was associated with positive cognitive outcomes for young children, particularly when child care providers had high levels of skill and education and child-teacher ratios were low. These positive effects were significant in both poor communities and more diverse communities even after other relevant factors such as family background and maternal education were controlled. However, an additional finding from these studies is an increase in children’s physically aggressive behavior after participating in center-based care, particularly for children who spend large amounts of time in these care arrangements. (Burr & Grunewald, 2006).

In addition, results from the Abecedarian Project illustrate the impact of an enriched full-day program for at-risk children beginning at just a few months old. Participating children were less likely to be retained in a grade and require special education and were more likely to enroll in a 4-year college (Masse & Barnett, 2002).

Several states, including Minnesota, have either implemented or are piloting Quality Rating Systems (QRS) that rate child care programs on a tiered rating system and publish the information for parents to review as they decide which child care program to choose. QRS provides incentives for programs to improve their quality, and parents can review how many “stars” each program has in selecting care. As parents demand quality, the market will likely move in that direction. Results from some state evaluations have shown that programs enrolled in the QRS do increase their quality levels. However, there hasn’t been an evaluation that rigorously measures the impact on child outcomes.

Preschool

The results from the Perry Preschool and Child-Parent Center studies show that a high-quality preschool program for 3- and 4-year-old low-income children can have a long-term impact on children that lasts into adulthood. Children who attended these programs were less likely to require special education and commit crime as adults, and they were more likely to graduate from high school and earn more money in the workforce.

A number of states sponsor preschool programs. Based on information from the National Institute for Early Education Research's state preschool yearbook (NIEER, 2007) and visits to state preschool Web sites, states use different funding levels and eligibility criteria. All programs are open to participation by children age 4, and several also enroll children age 3. Dosage, or the instruction time per week, usually entails a half-day program during the school year of 10-14 hours per week, or around two to three hours of lesson time per day. State funding per child per hour varies from \$1.91 in the New Mexico Children Development program to \$16.73 in the part-time Oregon Head Start Prekindergarten program. However, the intensity of services among state-sponsored preschool programs is less than the model programs of Perry and Abecedarian.

About half the programs use the Federal Poverty Line (FPL) to determine which children can participate. Of these programs, 9 of 19 use 185 percent FPL. Though most states do require children to have some risk factor in order to participate—whether economic, social, or academic—a few states extend the program to all children. Oklahoma, Georgia, Florida, Texas, New York, and West Virginia lead the way in the percentage of children participating. Studies of state-sponsored universal preschool programs show that all children, regardless of risk factors, demonstrate gains in school readiness measures, but children from disadvantaged environments show the largest gains.

Early Childhood Development on a Large Scale

The findings from early childhood research, promising though they are, pose a challenge: How can we reproduce the success of model early childhood development programs on a large scale? Programs such as Head Start and some other recent attempts to reach a large number of at-risk families have not consistently generated high returns. While a full critique of Head Start is well beyond the scope of this paper, several studies have concluded that even though there are pockets of success, long-term gains from Head Start have fallen short of the studies cited above, such as the Perry Preschool and Abecedarian programs. While Head Start is not funded at the levels of these model programs, we think the problem cannot be solved by more funding alone.

We argue that funding a top-down, planned system is unlikely to yield consistently high returns. We believe that large-scale efforts can succeed if they are market based and incorporate the following key attributes, most of which were discussed above: start early, involve parents, focus on at-risk children, provide incentives for quality programs, and make a long-term commitment.

Achieving these characteristics in large-scale programs requires the flexibility, innovation, and incentives that are inherent in markets. For some, this is a radical idea, but many middle- and upper-class families have long benefited from the power of markets for early childhood education by choosing the early learning centers that their children attend and by demanding results from those providers. This demand and supply system works.

Why not give the same purchasing power to those of lesser means? Our idea is to use the strength of the market by empowering parents of at-risk children with resources to access high-quality early education programs. That is, programs eligible to attract scholarship children must have characteristics that correlate with school readiness outcomes, such as well-trained teachers, relatively low ratios of children to teachers, and research-backed curricula. Qualified early education programs would then compete for the scholarship children; parents would make decisions about which programs they preferred for their children. This market-based approach is in contrast to the more conventional approach of increasing funding for existing programs, such as public school-based preschool programs, child care subsidies, and Head Start. Nevertheless, these programs can benefit by enrolling children with scholarships.

To establish a successful, long-term commitment to early childhood development, we have proposed a permanent scholarship fund for all families with at-risk children (Rolnick & Grunewald, 2006). Similar to endowments in higher education, earnings from an endowment for early childhood development would be used to provide scholarships for children in low-income families who aren't able to afford a quality early childhood program. The scholarships would cover child tuition to qualified programs plus the cost of parent mentoring via home visits to ensure parental involvement. Scholarships would be outcome-based, meaning that they would include incentives for achieving measurable progress toward the life and learning skills needed to succeed in school.

Parent mentoring would include parent education; information about available financial, health, and human-services resources; and guidance on selecting an early childhood development program. Research shows that reaching children with multiple risk factors as early as possible is essential; as discussed above, even age 3 may be too late. So we suggest that while scholarships would pay tuition for a child to attend an early childhood development program beginning at age 3, the parent-mentoring program could start as early as prenatal.

What would such a permanent scholarship fund cost? In Minnesota, we estimate that a one-time outlay of about \$1.5 billion—about the cost of two professional sports stadiums—would create an endowment that could provide scholarships on an annual basis to the families of children in Minnesota living below poverty. With the endowment's funds invested in corporate AAA bonds, earning about 6 percent to 7 percent per year, we estimate that \$90 million in annual earnings would cover the costs of scholarships, pay for program monitoring and assessments, and supplement existing revenue sources as needed for early childhood screening and teacher-training reimbursement programs.

Minnesota Pilot of the Scholarship Model

Our proposed market-based approach will be tested in a pilot project in the City of St. Paul with funding by the Minnesota Early Learning Foundation (MELF). MELF was inspired by a group of Minnesota business leaders who were compelled by the case for investments in early childhood education as a cost-effective form of economic development and lackluster results from a Minnesota school readiness assessment.

Founded in 2005, the MELF strategy is to demonstrate and test cost-effective systems for providing early childhood development programs in Minnesota. The foundation's board of directors includes CEOs from Cargill, Best Buy, Blue Cross and Blue Shield of Minnesota, Ecolab, Liberty Diversified, and Taylor Corporation. Its staff is at work raising money to reach a \$30 million fundraising goal to fund the scholarship pilot and a number of other innovative early childhood initiatives throughout Minnesota. MELF plans to gather information over a 5-year period (2007–2011) and then issue a set of recommendations to policymakers about how to create the most well-integrated, cost-effective system to prepare at-risk children for kindergarten.

The \$15 million St. Paul Early Childhood Scholarship Program pilot is coordinated by the City of St. Paul in collaboration with St. Paul-Ramsey County Department of Public Health and Resources for Child Caring. Beginning Jan. 1, 2008, the scholarships will be made available to low-income families with 3-year-old children living in St. Paul's North End and Frogtown neighborhoods. The scholarships provide up to \$13,000 per year to pay for two years at a full- or part-time, center- or family-based early education program. Home-visits from a parent mentor will connect families with information about available programs. After families enroll their children, parent mentors will help keep the family connected with early education programs by providing information about parent activities at the programs and other pertinent community resources.

In addition, parent mentoring will be available to families with expectant mothers and infants through age 2. Even though these families don't qualify for a scholarship until their children turn 3, parent mentors will provide information on choosing quality early care and education settings, as well as information on early health and nutrition.

Families can use their scholarship at an early education program that meets quality criteria. That is, programs eligible to attract scholarship children must have characteristics that correlate with school readiness outcomes, such as well-trained teachers, relatively low ratios of children to teachers, and research-backed curricula. A pilot of a Quality Rating System called Parent Aware will rate early education programs in St. Paul citywide and will identify eligible programs for scholarships.

The market-based approach is unique among early childhood investments. Typically, governments fund programs directly, such as Head Start and state-sponsored prekindergarten programs. In a scholarship system, parents select early education programs for their children; programs are then paid based on the number of children served. While a scholarship system is similar to the child care subsidy system in that

parents select a child care program for a child and funds are distributed to the program, a scholarship system is focused primarily on educational progress for the child, not on making it possible for parents to enter the workforce. That is, a parent's work status doesn't affect a child's eligibility to attend an early childhood program. In addition, children remain eligible for scholarships even if their family moves, as long as the family stays in Ramsey or Hennepin counties.

SRI International's evaluation will measure success of the pilot through the following outcomes:

- Children—Are children likely to enter school ready to succeed?
- Parents—Are parents involved in their child's education?
- Early education programs—Did the supply of programs respond to the increase in demand by providing more openings in high-quality programs for children?

Compared with the billions of dollars spent each year on high-risk economic development schemes, we think this type of an investment in early childhood programs is a far better and more secure economic development tool. We are confident that early childhood development investments driven by a market-based approach that focuses on at-risk children, encourages parental involvement, produces measurable outcomes, and secures a long-term commitment will lower crime, create a stronger workforce, and yield a high public return.

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