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**BENEFITS AND COSTS OF QUALITY PRESCHOOL EDUCATION: EVIDENCE-BASED POLICY
TO IMPROVE RETURNS**

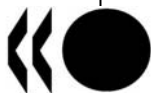
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Miho Taguma, Analyst; Tel: +33 1 45 24 92 65; Email: Miho.Taguma@oecd.org

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Benefits and Costs of Quality Preschool Education:

Evidence-Based Policy to Improve Returns

W. Steven Barnett

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“Education must be made more thorough. The schoolmaster must learn that his main duty is not to impart knowledge, for a few shillings will buy more printed knowledge than a man’s brain can hold. It is to educate character, faculties, and activities; so that the children of even those parents who are not thoughtful themselves may have a better chance of being trained up to become thoughtful parents of the next generation. To this end public money must follow freely. And it must flow freely to provide fresh air and space for wholesome play for the children in all working class quarters.”

Alfred Marshall, *Principles of Economics*, 1890.

W. Steven Barnett
National Institute for Early Education Research
120 Albany Street, Suite 500
New Brunswick, NJ 08901
(732) 932-4350
sbarnett@nieer.org

Benefits and Costs of Quality Preschool Education: Evidence-Based Policy to Improve Returns

Preschool education is one of the most rapidly growing sectors in education globally.¹ Worldwide enrollment rates in early care and education settings outside the home have grown steadily since the 1960s. In a number of European nations, and increasingly elsewhere, publicly funded early care and education is available to virtually all children beginning at ages 3 or 4. Many more countries publicly fund early care and education for disadvantaged children at ages 3 and 4, and some provide substantial funding for programs to serve children prior to age three. In the United States, the best known of these programs are Head Start and Early Head Start, but they are far from the only public early childhood initiatives.

Many preschool programs serve dual purposes—increasing the employment of mothers and enhancing child development even if it is often the case that one purpose is emphasized over the other. Both purposes enter into calculations regarding whether such public investments make good economic sense. This paper reviews the evidence regarding the economic benefits of preschool programs with a primary emphasis on child development benefits and greatest attention to evidence from the United States. It concludes that carefully designed programs and policies can produce substantial benefits for children with high economic returns to society. However, many current programs and policies produce much more limited benefits. Improvements in benefits may be obtained through judicious changes in policy.

A Comprehensive Overview from Meta-Analysis

Multiple reviews and meta-analyses conducted over the past 25 years have found preschool programs to produce an average immediate effect of about half (0.50) a standard deviation on cognitive development.² This is the equivalent of 7 or 8 points on an IQ test, or a move from the 30th to the 50th percentile for achievement test scores. For the social and emotional domains, estimated effects have been somewhat smaller, averaging about 0.33 standard deviations. To put these gains in perspective, it's important to realize that on many measures, a half standard deviation is enough to reduce by half the school readiness gap between children in poverty and the national average.

Dozens of studies have examined preschool education's long-term effects, providing information on effects into elementary school and beyond.³ They find evidence, though it is not always consistent across studies, of significant lasting effects on cognitive abilities, school progress (grade repetition, special education placement, and high school graduation), and social behavior. Estimated effects tend to decline as children move from preschool programs into primary schools and beyond. This has given rise to the widespread notion that preschool program effects fade out over time, and even to claims that effects eventually disappear altogether. Little consideration appears to have been given to the possibility that public education might exert a substantial (and expensive) compensatory effort that could be responsible for some catching up by children who had not attended preschool programs.

Recent meta-analyses provide two of the most comprehensive summaries of the evidence on preschool program benefits to date. Camilli and colleagues summarized the results of 123 studies from the United States.⁴ They report variations in effect sizes by age of intervention and age of follow-up, program features, characteristics of the population served, and research design. Average effect size for cognitive development across all programs and ages was just under 0.25 standard deviations, with effect sizes for schooling and social behavior about 0.15 standard deviations. As there are a large number of effect sizes for cognitive development, more fine-grained analyses are possible for this outcome. Effect sizes are larger when more rigorous designs were employed, and effect sizes are larger immediately at the end of a program (0.48 sd) than in later follow-up. In more rigorous studies, average effects were 0.70 standard

deviations up to age 5 and about half that later on. Even in the adult years, the average effect size is still 0.30 standard deviations. Note that social behavior and schooling outcomes have been measured primarily in long-term follow-up and no pattern of change in effects over time was found, but the number of effect sizes for these outcomes was too small to provide much power to detect differences over time. To return to the cognitive measures, it was also found that effect sizes were larger for programs that provided direct instruction and smaller for those that provided comprehensive services to children and families.

Nores and Barnett conducted a meta-analysis of 38 studies that used more rigorous quasi-experimental or experimental designs to estimate the effects of preschool programs outside the United States.⁵ Most of these studies were conducted in low-income countries. Across these studies, long term effect sizes for cognitive development are similar to those in the United States, 0.32 standard deviations up to age 18 and 0.40 standard deviations beyond age 18. Effects on social behavior and schooling are larger than in the US study. However, within this sample of studies effect sizes tended to be smaller in lower income countries than in higher income countries (though the preschool programs are not necessarily comparable). Three major categories of programs—nutrition, cash transfers, and education (typically also including nutrition in lower income countries)—all had significant effects. Preschool education had larger effects for cognitive development and school and than the other two types of interventions, but given the small number of studies and differences in conditions from country to country, differences in outcomes by type of intervention should be considered food for thought rather than yielding strong conclusions.

Three Economic Analysis

Three cost-benefit analyses (CBAs) have been conducted using data from studies that followed children from the preschool years into adulthood. These studies used rigorous research designs (two are randomized trials) and provide the breadth and duration of data collection necessary for the cost-benefit analysis. These three CBAs provide a stronger basis for drawing implications for public policy than any single study might because they allow for generalization across different types of programs, different geographic regions, and different time periods. In addition, some of the differences across studies provide a basis for learning something about how variations in the population served, program characteristics, or context affect the costs and benefits. Of course, these analyses do not stand alone, but also must be interpreted in the context of the larger literature summarized above. The larger literature provides confirmation of the effects underlying estimated economic benefits in these three studies, but the magnitudes of the effects in the randomized trials are large relative to those found in many other studies. This is discussed in more detail after reviewing the economic findings. The three CBAs and their findings are briefly described in Table 1.

Two of the CBAs are based on studies of half-day programs provided to children at ages 3 and 4. One of these is the Perry Preschool program, a small-scale, intensive program implemented in the public schools of Ypsilanti, Michigan.⁶ The other is the Child-Parent Center (CPC) program, implemented on a large scale over several decades by the Chicago Public Schools.⁷ The CPC replicates the half-day education at ages 3 and 4 approach of the Perry Preschool approach at a lower intensity that is similar to many public education programs operating today. The estimated effects of these two programs are well within the bounds indicated by the U.S. meta-analysis, and the CPC program's initial impacts are comparable to those found for similar large-scale public school programs in recent years.⁸

The estimated cognitive effects of the Perry Preschool are similar to those found in other studies of *educationally-intensive* half-day preschool programs (small numbers of students with highly-qualified, well-supervised teachers. Its estimated long-term impacts on economic and social outcomes, particularly on crime, are quite large, but where effects can be compared to those found in substantial numbers of other studies of intensive programs (for example, achievement, grade repetition, special education) the effects are not unusually large. Looking at effects over time, the Perry Preschool produced substantial effects on achievement test scores at least into secondary school and decreased special education placements. At age 19, preschool

education was found to increase high school graduation (67% v. 50%), increase employment, and decrease delinquency. At age 27, the preschool program was found to have increased earnings and ownership of homes and automobiles, and decreasing crime (cutting arrests in half). At age 40, the evidence indicates that increased earnings and decreased crime had continued from age 27.

The CPC study follow-up has continued through age 26 and produced outcomes remarkably consistent with those of the Perry Preschool study.⁹ The estimated positive effects from the preschool portion of this program (many children also receive a primary school intervention) include: increased achievement from age 5 through age 15, decreased grade repetition, decreased special education, decreased arrests and incarceration, and increased high school graduation. The CPC study also found a reduction in substantiated reports of child abuse and neglect from ages 4 to 17 (5% v. 10%), a benefit not investigated in other studies. Estimated effects of the CPC program on special education, grade repetition, and juvenile arrests are similar in size to those of the Perry Preschool program. However, CPC was found to have a smaller effect on crime and on high school graduation compared to the Perry Program, and both are important determinants of economic benefits. As the CPC's age 26 CBA results are not fully published yet, this paper reports the results of the age 21 CBA.

The third CBA is based on a study of the Abecedarian program, which differed from the others in that it provided education in a year-round child care program operating up to 10 hours per day and serving children from the first year of life to age 5.¹⁰ Thus, the Abecedarian program provided many more hours of intervention from a much earlier age. It also was the only one of the three programs that fully met the child care needs of parents working full-time or even long part-time. Thus, it is the only one that might be expected to produce significant benefits by increasing maternal employment.

As can be seen from Table 1, the Abecedarian program had much larger effects on grade repetition and special education. It also produced much larger increases in children's test scores and large achievement test score differences persisted through age 21. The impact on high school graduation is similar in size to that for the Perry Preschool program (67% v. 51%), but the Abecedarian study finds larger impacts on post secondary education. The Abecedarian program more than doubles the percentage who are attending or have graduated from a four year college at age 21 (36% v. 14%). Estimated effects on college attendance are much more modest in the other two studies (5-6 percentage points). No effects are found on crime in the Abecedarian study. It is possible that age 21 is too soon to observe crime effects, given the sample size, but the trends in the data are not suggestive of a positive effect. The Abecedarian study is the only one for which health benefits have been estimated, based on a difference in smoking rates. However, comparison with data from the Perry study shows a very similar difference in smoking in that study—indicating that this is an overlooked benefit in the Perry CBA.¹¹

The Abecedarian CBA finds two substantial benefits to parents from the child care provided by the program. One is the immediate benefit from free child care that reduces costs parents and the public, which is estimated from the control group's child care costs (paid and unpaid). This estimated short-term child care cost savings is substantial: \$27,612 (discounted at 3% in 2002 dollars), over 40% of the program's cost. The other child care benefit is a long-term increase in maternal earnings due to more stable labor force attachment in early years. These increased earnings result from increased seniority, on-the-job training, and other benefits of experience and a steady work record. This second benefit is estimated directly from reported earnings after the study children have entered kindergarten and amounts to \$68,728 per child (discounted at 3% in 2002 dollars). These estimated effects on earnings are consistent with other estimates of the impacts of child care on labor force participation in low-income populations.¹²

The two child care benefits together amount to more than the cost of the program. In thinking through the policy implications, there are several points to keep in mind. First, the educational quality of the Abecedarian program may have been a factor in persuading parents to use such long hours of child care for

their very young children. Second, the parents in this study volunteered knowing that this study offered the opportunity for full-time child care from birth to kindergarten, and so they may not be typical of the population generally. Of course, welfare reform has imposed substantial work requirements on low-income families that may make this program more relevant to low-income families today than when it was offered. Third, the child care benefits are not entirely captured by the parents because taxes reduce net earnings and some of the control group child care was subsidized. Even if the lifetime value of child care benefits exceeded the costs of child care on average, parents still might have been unable or unwilling to invest in this much child care given their access to cash to pay for the services and the uncertainties facing each individual regarding their future employment and earnings.

In sum, all three preschool education programs produced benefits far in excess of cost. The breakeven point for the cost-benefit test (after discounting) is one to one. All yielded a substantial return even though the three CBA's estimated somewhat different benefits from somewhat different programs serving somewhat different children. Net present value varied from \$75,000 to over \$200,000 per child. These figures imply that the streams of benefits are equal to annual rates of return exceeding what can be earned in the private sector on very low-risk investments, and at least for the two half-day preschool education programs returns exceed those to private equities. This rate of return is far higher than, for example, the historic rate of return to private equities. Moreover, from Table 1 it is clear that these analyses likely underestimate the returns. The Perry and CPC analyses excluded plausible benefits from improved health and higher earnings of future generations. Subsequent follow-ups in the Chicago and Abecedarian studies have both found reductions in adult depression that would increase economic benefits. The Abecedarian program's failure to find crime cost savings may not be intrinsic to a full-day program over five years, but may be due to specific local circumstances or the curriculum used. Belfield has identified a substantial number and estimated of other likely benefits not included in these CBAs.¹³ Finally, some of the benefits of preschool education are not readily converted into monetary terms, for example, the value to children and families from avoiding school failure or the value of improved planning regarding pregnancy and child birth that reduced the number of abortions.

There is a remarkable amount of consistency across studies in the evidence presented in Table 1. The CPC replicated key findings of the Perry Preschool program, as closely as might be expected allowing for the differences in program intensity. There is additional study confirmation of results with the Abecedarian study, as well. Yet, these are not the only longitudinal studies that confirm the outcomes important in the CBA. All three studies are reinforced by the broader evidence cited above including findings on reduced grade repetition and special education, which are not only indicators of cost savings, but also strong predictors of high school graduation, a predictor of lifetime earnings. Key findings of the Abecedarian study were closely replicated by the highly similar Milwaukee project, if one looks at the estimated effect sizes and not just at whether differences reach statistical significance at conventional levels given the small sample size.¹⁴ A randomized trial of high-quality part-day preschool education with long-term follow-up in the very different context of Mauritius provides confirmation of reductions in delinquency and crime into the early adult years.¹⁵

The evidence reviewed above leaves little doubt that preschool education can be a remarkable investment with high returns and important impacts on the educational, social, and economic success of children growing up in disadvantaged circumstances. However, care should be taken in applying the specific estimates of benefits and returns obtained in these studies. To begin with there is considerable uncertainty surrounding the estimated effects and the assumptions necessary to estimate their dollar values. Heckman and colleagues recently produced estimates of returns to the Perry Preschool program that are lower than previous estimates primarily because he makes different assumptions about, for example, the costs of crime and effective tax rates.¹⁶ Yet, such differences as variations in assumptions make are trivial next to potential differences in rates of return from variations in program characteristics, the population served, and the broader social, educational, and economic context. There is no guarantee that public preschool programs in the United States or any other country realize any positive rate of return at all, much less produce returns that correspond to any of the estimates in Table 1. In the United States, the continued poor educational outcomes of children in

poverty raise important questions about the effectiveness of current policies and how governments might maximize the economic returns to the billions of public dollars spent annually on preschool programs (see Table 2). The remainder of this paper addresses the issues of current returns to public programs and potential returns to policy improvements.

Child care

There is a long history of research investigating the effects of typical child care arrangements on the general population with an emphasis on potential negative impacts on social and emotional development. More recently, the field has increased its attention to cognitive development and the potential for positive effects. Studies have relied on statistical analysis of natural variation rather than experiments. Over time child care research has evolved from asking about the average effects of care to asking how the effects of care vary depending on quality and the characteristics of children and families.¹⁷

Child care has not proved as detrimental as some predicted, nor as beneficial as others hoped.¹⁸ Modest negative effects on children's social behavior have been found, and while there is some risk of spurious findings due to selection into child care, the most careful studies suggest this is not due to selection.¹⁹ Child care, particularly care in centers, has been found to produce small benefits to cognitive development.²⁰ Effect sizes for quantity, quality, and type of child care have tended to be below 0.10 standard deviations. Effect sizes may be somewhat larger for disadvantaged children. The NICHD child care study finds somewhat larger effects for center-based care continuously from age three to five, but also finds long-lasting negative behavioral impacts of hours and positive cognitive impacts of quality of just under 0.10 standard deviations, with the added indication that very high levels of quality might produce larger gains in cognitive abilities.²¹

From the evidence above, it should be apparent that the impacts of increased subsidies for child care depend on current usage patterns and the types and quality of child care subsidized. In Canada and the United States, studies have found that the net impacts of increased public subsidies for child care on child development are modestly negative for both social behavior and cognitive development.²² Other researchers find that, at best, positive cognitive impacts in the United States would be quite small, perhaps a 0.05 standard deviation improvement into early primary school.²³ In other countries, effects on child development might be better or worse. There are, of course, positive effects on maternal labor supply.²⁴

Head Start

The best estimates of the effects of Head Start are provided by the National Impact Study of a large sample of children across the country randomly assigned to attend Head Start or not at ages 3 and 4.²⁵ The estimated cognitive effects of nine months of Head Start were quite modest, and by kindergarten effects of the program were no longer evident on most measures of cognitive or social development. Effects tend to be smaller for cognitive measures of broad domains and larger for measures of limited sets of literacy skills and knowledge more easily taught and mastered in a brief time. However, no evidence was found of any negative effects on socio-emotional development, a distinct improvement over child care.

The National Impact Study does suffer from the influence of "crossovers," children whose experience didn't actually correspond to their assignment. At age 4, only 86% of the treatment group actually attended Head Start, while 18% of the control group found their way into a Head Start program elsewhere. Adjustments for crossovers yield estimates in the range of 0.15 to 0.35 standard deviations for immediate impacts, but still leave estimated effects on achievement in kindergarten and first grade in the range of 0.05 standard deviations or less. These effects are far smaller than would have been hoped for based on the literature as a whole.

Prekindergarten

Generalization about state and locally funded prekindergarten programs in the United States is more difficult because policies vary greatly from one jurisdiction to another.²⁶ However, recent studies of programs operated under the auspices of public education and with relatively high standards find effect sizes on a broad measure of cognitive development of about 0.25, on literacy skills of about 1.0, and on mathematics of about 0.40 standard deviations at kindergarten entry.²⁷ These positive effects are found for boys and girls, for white, black, Hispanic, and Native American children, and for children who do and do not qualify for free and reduced-price lunches. Effect sizes appear to be somewhat larger for minority children. Social behavior is less studied, but positive effects are evident there, as well.²⁸ Long-term effects have not been studied as rigorously, but there is evidence of persistent effects that are substantially larger than for other types of programs.²⁹

Maximizing Benefits of Public Programs

The failure of major public programs in the United States to achieve the potential indicated by the larger literature indicates the importance of turning to the literature for more information about how the effectiveness and economic returns of publicly supported preschool programs might be improved. The key dimensions along which policy variations may be important are person, process, and context. Person refers to the population served. Process refers to the program delivered. Context refers to the broader educational and social environment in which the program is delivered. Research provides insights into how decisions relating to each dimension may influence program effectiveness and the economic returns to preschool education.

Person

Low-income populations have a relatively high incidence of the problems that preschool programs seek to address and that account for much of the economic return: low cognitive and social skill levels at entry to kindergarten; high rates of grade repetition, special education, and high school dropout; low earnings; and high rates of delinquency and crime. Studies find larger effects for more disadvantaged children, but effects for more advantaged children can be substantial and may endure even for highly advantaged children.³⁰ In addition, low-income families have the least capacity to purchase quality preschool programs privately. Preschool programs should be expected to yield larger economic benefits for children from low-income families other things equal. Person and process intersect here as the content and competence of education in publicly supported preschool programs relative to that provided by parents in the home and by private sector preschool program participation is likely the primary determinant of any learning gains for children.

The problems addressed by public preschool programs are not limited to children in poverty who constitute roughly the bottom quintile of the income distribution in the United States. As shown in Figures 1 and 2, the relationship between family income and children's social and cognitive abilities at school entry (age 5) is nearly linear. Children at the median income are developmentally as far below those in the top income quintile at "optimal" development as children from families in the bottom income quintile are behind them. For older children, Table 2 shows that grade repetition and high school dropout are still roughly half as prevalent among children from middle income families as they are among children from families in the bottom 20th percentile.

At least in the United States, although the problems addressed by preschool and, therefore, the potential benefits, are much larger for children in poverty they remain large for much of the population. This suggests that benefits from preschool will not suddenly cease at the poverty line. If the average return to preschool education for children from middle-income families was half that for children in poverty, the CBA results presented earlier more than large enough to justify investing in public preschool programs for

middle-income children, as well. Moreover, because there are so many more middle-income children, the preponderance of the problems addressed—educational failure, poor productivity—is accounted for by the middle class. The slope of the gradient linking income with early learning and development and later educational and social problems likely varies from country to country as will the portion of these problems associated with children in poverty.

Although a full discussion of the relative advantages of targeted and universal programs is beyond the scope of this paper, it is noted that there are numerous practical considerations that favor a universal approach beyond the benefits to children from higher income families. Children from lower income families may benefit more from programs that serve children from higher income families, perhaps because they learn from peers as well as teachers.³¹ Targeting is highly imperfect for many reasons not least of which is that income is a moving target and poverty is not a permanent condition for most children who experience poverty. Yet, preschool education must be delivered continuously over a substantial period of time to be effective. Families may also wish to avoid the stigma associated with programs for the poor and this may hinder full participation. Under reasonable assumptions, a universal program can generate greater total benefits net of cost than a targeted program, even if benefits are substantially lower for children from higher income families.³²

Process

Preschool programs vary tremendously in their quality including the nature, intensity, and content of their educational activities. As discussed above, many publicly supported preschool programs in the United States are educationally weak.³³ Although circumstances vary, concerns about the quality and educational effectiveness of preschool programs reach around the globe.³⁴ Economic returns to public investments in preschool programs could be significantly improved if those programs were more closely aligned with programs research has found yielded strong returns or with programs for which there is evidence that they produce educational gains of even roughly similar magnitude to programs demonstrating strong economic returns.

Quality

All of the programs with strong CBA results had well-qualified and compensated teachers, small classes, and higher teacher-child ratios. They had stronger supervision and in two it is clear that they systematically engaged in reflective teaching and that teacher-child discourse was similar in important ways to that which children encounter in primary school.³⁵ Unfortunately, most child care and preschool teachers are less qualified and more poorly paid than in programs found to yield strong returns.³⁶ Although some correlational studies have failed to find a strong, consistent relationship between these structural features of preschool programs and children's learning, such studies have severe methodological limitations.³⁷ Also, such studies are poorly suited to capturing the effects of resources that facilitate, but do not ensure, educational effectiveness. If structural features did not matter we could expect to find examples of inexpensive, structurally weak programs producing large gains for children. However, none have been found. Experiments would provide strong evidence, but they are not common. An experimental study in Mauritius found large gains from improving class size and teacher qualifications.³⁸ The disparities in features between programs that have produced large economic returns and those programs supported by current policies seem to be more than sufficient to explain why the latter do not replicate the results of highly cost-effective programs.³⁹ Improving structural features alone will not guarantee improvements in educational effectiveness, but improvements in structural features together with a process for monitoring and supporting continuous improvement can greatly improve the educational effectiveness of preschool programs.⁴⁰

One of the program elements that could benefit from more research is the impact of curriculum. The most recent meta-analysis indicates that how children are taught and the emphasis on teaching as opposed to

other services matters for cognitive development. Curriculum also matters for social and emotional development. Not only studies of specific programs like the Perry Preschool, but also the randomized trials of Head Start and Early Head Start have found *only* positive effects on social and emotional development. Child care studies overwhelmingly find negative effects on social and emotional development. Although we should be cautious in drawing conclusions because some nonexperimental studies of Head Start have found negative effects on social and emotional development (perhaps implicating the methodology), we must be concerned that public policies may be harming the social and emotional development of children when they could be producing positive effects. Particular attention should be devoted to ensuring that curricula enhance rather than detract from social development.⁴¹

Quantity

Isolating the effects of the age at start and duration of preschool education is difficult, and direct experimental comparisons are rare. Some effective models have been half-day programs during the school year, though one recent randomized trial finds an advantage for full-day over half-day preschool education.⁴² Other nonexperimental studies find that starting at an earlier age produces larger gains for preschool children, but do not necessarily find a full day to be more effective.⁴³

Comparisons across the three CBA's are instructive on length of day. Even if there were no differences in child outcomes, the large benefits from child care are only produced if the program meets parental needs for child care. A half-day program offers very little useful child care. Some parents might have their needs largely met by a school-day, school year program. A year-round program with a longer day clearly meets even more needs. The impact and value of duration depends on parental needs and desires for employment—none, part-time, or full-time—and the availability of wrap around child care options either public or private. The potential value of child care benefits is large enough to make it a major consideration in policy development.⁴⁴ In addition, the hours of operation may influence parental willingness to send their children to a program if parents find it difficult to transport their children to and from part-day programs or to obtain child care arrangements when preschool is not in session.

Comparisons across studies indicate that only programs beginning with infants have produced permanent increases in IQ. These programs also produce quite large gains in achievement and school success. They also operated full day year-round and provided a large number of hours. Clearly such programs are much more expensive. With few studies of high-quality birth to five interventions and no randomized trials comparing them to shorter programs it is difficult to judge the net benefits. The ubiquity of the “Heckman curve” notwithstanding, the empirical evidence does not support the expectation of exponentially higher returns as the age at which public investment begins declines.⁴⁵ Rates of return have not been higher for programs serving infants and toddlers than for those serving preschoolers. To the contrary it is clear that cost can increase dramatically as age falls, while the amount by which benefits increase is highly uncertain. Nor is there any real theoretical rationale for the expectation of higher returns, much less an exponential increase. Finally, the return to any new public investment depends on pre-existing public and private investments. Returns could be squandered if government invests early without sustained support for continued development in subsequent years.⁴⁶

Context

The benefits of preschool programs can vary with the broader social and economic contexts. This includes primary and secondary education policies. For example, policy dictates that no children are retained in grade then no effects on grade repetition are possible. Public education systems could be so poor that gains from preschool education are subsequently be lost, especially for children from low-income families. For example, if there are insufficient places in secondary school then long-term gains might be limited. So far, research has not found practical examples of such programs. The results of the Perry and Chicago studies and

the national randomized trial of Head Start indicate that this is not a problem in the United States. Also, studies in Latin America have found long-term gains in substantially different circumstances from those in the United States.⁴⁷ The international meta-analysis suggests that long-term gains from early investments are remarkably robust with respect to differences in the broader social and economic conditions including public investments in health and education.

Conclusions

Preschool education can produce substantial gains in language, cognitive, social and emotional development. These early gains can lead to long-term increases in educational success and, in turn, adult social and economic success. As a result, public investments in highly effect preschool programs can produce economic benefits that substantially outweigh their costs. This has been demonstrated in several studies of programs for economically disadvantaged children. From a societal perspective, public investments in high quality preschool education are warranted on purely economic grounds. In addition, such investments also improve educational, social, and economic equality. A case can be made that returns to universal investments in preschool programs can also pass a cost-benefit test. Universal programs could have smaller or larger effects on inequality depending on the effects on participation and relative sizes of effects on children from different economic backgrounds.

Unfortunately, in the United States public policies to date have been relatively weak with child care subsidies in particular potentially harming child development and increasing inequality. Although any negative effects are likely to be quite small, this contrasts sharply with the potential for large positive impacts. Whether one's concern is with economic efficiency or children's rights, public policy needs to be sharply focused on investing in preschool programs that are more likely to replicate the results of the programs found to yield high rates of return.

Public action is needed to produce more optimal investments in the education of young children. Even if Head Start and other programs passed a simple cost-benefit test, they are far from optimal. Part day programs neglect the benefits from child care, and most programs fall short with respect to educational quality child care most egregiously. Education and child care policy need to be jointly developed to fully realize the potential economic returns from well-designed programs.

In some countries public preschool programs target children in poverty. This is consistent with evidence that returns are higher for these young children. There are practical problems with this approach. First, programs such programs often fail to adequately serve the targeted population. Second, benefits extend up the income ladder far beyond poverty. The majority of school failure and dropout cannot be prevented without addressing problems of the larger middle class. There is no sharp dichotomy between the poor and everyone else, but a smooth gradient linking income and development. This gradient can be flattened and shifted upward by quality preschool programs.

Although there are clear directions in which public preschool policy should move to improve its effectiveness and economic efficiency, much remains to be learned about the optimal timing, duration, and intensity of preschool education. How much what is best generalizes from country to country is unknown. Substantial progress toward providing policy makers and parents with better information about what is "best" will require a substantial investment in systematic experiments by national governments. Making such studies are regular part of program operation could create a system for permanent improvement and response to change that would yield benefits for many decades into the future.

Table 1. Three Benefit-Cost Analyses of Preschool Programs

| | Carolina Abecedarian | Chicago Child-Parent Centers | High/Scope Preschool | Perry |
|------------------|---------------------------------|---|---------------------------------|--------------|
| Year began | 1972 | 1985 | 1962 | |
| Location | Chapel Hill, NC | Chicago, IL | Ypsilanti, MI | |
| Sample size | 111 | 1,539 | 123 | |
| Research design | Randomized | Matched neighborhood | Random assign | |
| Ages | 6 weeks to age 5 | Ages 3-4 | Ages 3-4 | |
| Program schedule | Full-day, year round | Half-day, school year | Half-day, school year | |

Findings

| | | | |
|---------------------------------|---------------------|---------------------------|---------------------|
| Increased IQ short-term | Yes | Not Collected | Yes |
| Increased IQ long-term | Yes | Not Collected | No |
| Increased achievement long-term | Yes | Yes | Yes |
| Special education | 25% v. 48% | 14% v. 25% | 37% v. 50% |
| Retained in grade | 31% v. 55% | 23% v. 38% | 35% v. 40% |
| High school graduation | 67% v. 51% | 62% v. 51% | 65% v. 45% |
| Ever arrested as juvenile | 45% v. 41% | 17% v. 25% | 16% v. 25% |
| Mean number of adult arrests | 1.7 v. 1.5 (age 21) | Felony .32 v .44 (age 26) | 2.3 v. 4.6 (age 27) |
| Adult Smoker | 39% v. 55% (age 21) | Daily use 18% v 22% | 42% v. 55% (age 40) |

Cost-benefit results (2002 dollars, discounted at 3%)

| | | | |
|------------------------------|---------------|---------------|---------------|
| Cost | \$ 63,476 | \$ 7,417 | \$ 15,386 |
| Child Care | 27,621 | 1,829 | 919 |
| Maternal Earnings | 68,728 | 0 | 0 |
| K-12 Cost Savings | 8,836 | 5,377 | 8,556 |
| Post-Secondary Ed. Cost | - 8,128 | - 615 | - 1,309 |
| Abuse & Neglect Cost Savings | Not Estimated | 329 | Not Estimated |
| Crime Cost Savings | 0 | 36,902 | 173,959 |
| Welfare Cost Savings | 196 | Not Estimated | 774 |
| Health Cost Savings | 17,781 | Not Estimated | Not Estimated |
| Earnings | 37,531 | 30,638 | 79,743 |
| Second Generation Earnings | 5,722 | Not Estimated | Not Estimated |
| Total Benefits | \$158,278 | \$ 74,981 | \$ 263,642 |
| B-C Ratio | 2.5 | 10.1 | 17.1 |

Table 2. Major Federal and State Expenditures for Preschool (Children Under Age 5)

| | 2008 | 2010 | FY11 Proposed |
|--|-----------------|-----------------|--|
| Head Start (excluding Early Head Start) | \$6.2 billion | \$6.9 billion* | \$6.9 billion |
| Early Head Start | \$689 million | \$1.3 billion* | \$1.3 billion |
| Child Care Subsidies (CCDF) | \$4.9 billion | \$6.0 billion* | \$6.6 billion |
| Child Care Food Program | \$1.3 billion | \$1.6 billion | \$1.6 billion |
| Tax Credits (CTCDC and DCAP) | \$2.5 billion | \$2.5 billion + | Expected increase since Obama proposal raises CTCDC eligibility limits |
| DOD Child Care | \$300 million | \$300 million | \$300 million + |
| Title I Preschool | \$400 million | \$400 million | \$400 million |
| Preschool Special Education (IDEA Part B, Sect. 619) | \$374 million | \$574 million* | \$374 million |
| Early Intervention for infants and toddlers with disabilities (IDEA Part C) | \$436 million | \$689 million* | \$439 million |
| Home Visiting | \$0 | \$0 | \$100 million |
| State Pre-K Initiatives (spending from all sources) | \$5.2 billion | \$5.7 billion | \$5.7 billion |
| State & Local Preschool Special Education Spending | \$5 billion | \$5 billion | \$5 billion |
| State Early Intervention | \$2-3 billion | \$2-3 billion | \$2-3 billion |
| State Child Care Subsidies | \$2.4 billion + | \$2.2 billion | \$2.2 billion |

* Includes additional ARRA funds for FY2010

Table 3 Grade Repetition and Dropout Rates by Family Income

| <u>Family Income</u> | <u>Repeated a Grade</u> | <u>Dropped Out</u> |
|----------------------|-------------------------|--------------------|
| Lowest 20% | 17% | 23% |
| 20-80% | 12% | 11% |
| Highest 20% | 8% | 3% |

Figures are multi-year averages. Source: US Department of Education, NCES (1997). *Dropout rates in the United States: 1995.*

Figure 1.⁴⁸

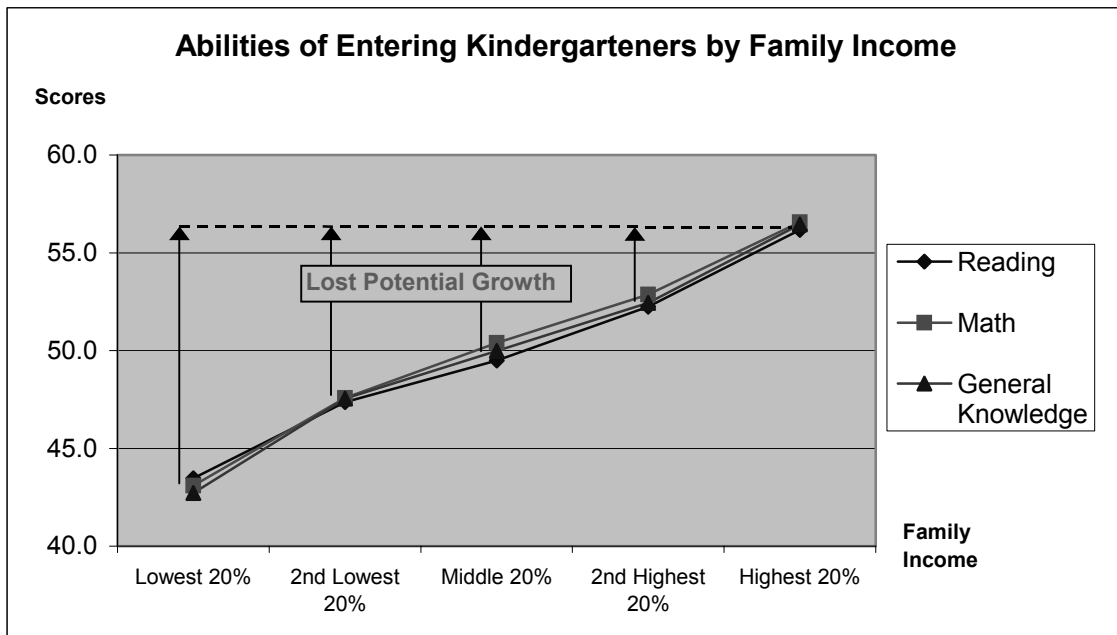
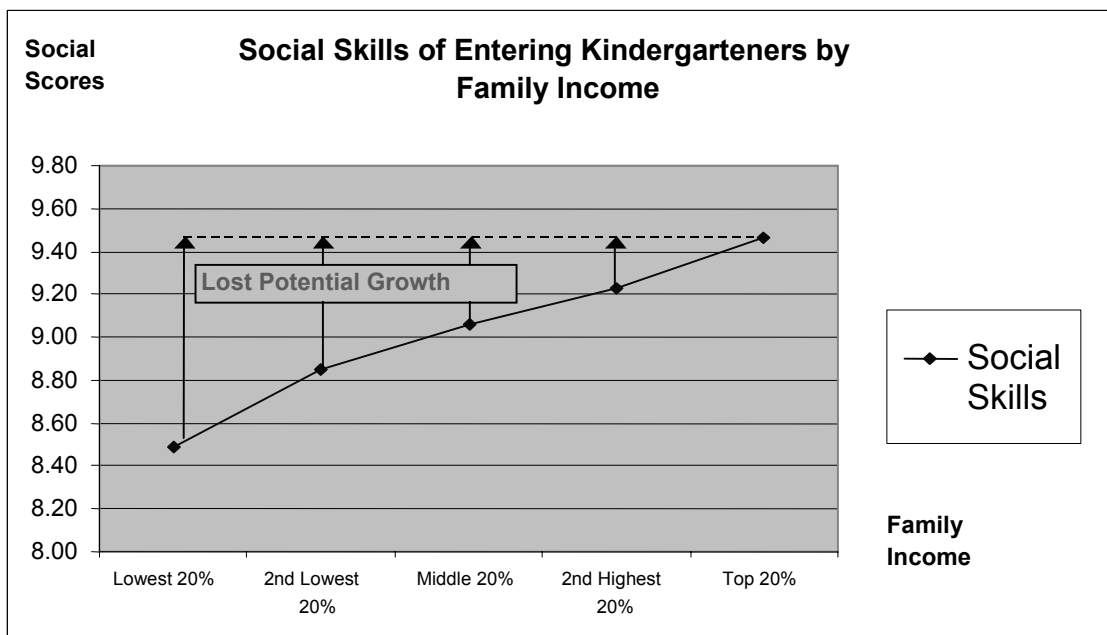


Figure 2.⁴⁹



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