
Maximizing Returns from Prekindergarten Education

W. Steven Barnett

Public investments in prekindergarten education have been promoted on the grounds that such programs can produce high rates of return. This paper reviews the basis for such claims and identifies policy choices likely to affect actual returns. Experience demonstrates that potential gains are not always realized. As preschool education has become ubiquitous, the time is ripe to develop policies to ensure that the public reaps an adequate return on its investment. Such policies will significantly increase educational gains, particularly for our most disadvantaged children.

BACKGROUND

Prior to 1960, most children were educated entirely at home before age five or six. Today, most children in the United States enter a classroom at age three or four. Although increased labor force participation has played some role in this trend, demand for formal education appears to play a larger role. Preschool attendance rates have increased at roughly the same pace whether or not the mother is in the labor force, as shown in figure 1. Much of the increase in preschool education has been privately funded, but public-sector expenditures have increased substantially, as well.

Although preschool attendance has become the norm, the result has been far from uniform with respect to either quality or quantity; and, some children have been left behind altogether. Whether a child attends a preschool program still depends on family income and parental education. Program standards are much more variable than for K–12 education and generally are quite low, especially for child care programs. Nevertheless, parents report virtually all of these to be educational and express high levels of satisfaction (Emlen 1998; Helburn and Howes 1996; West, Hausken, and Collins 1993). By contrast, research finds wide variations in the educational effectiveness of these programs, and that many have little positive effect and some negative effect on child development (Magnuson, Ruhm, and Waldfogel 2004; Sammons et al. 2002a, 2002b; Vandell 2004).

This paper seeks to provide increased clarity regarding the potential benefits and possible adverse effects of early care and education, with particular emphasis on the effects for children disadvantaged by socioeconomic circumstances. In addition, it seeks to summarize what is known about the extent to which variations in child characteristics, program characteristics, and the social environment alter the magnitude of the educational benefits from early education. Key issues in the review are the nature and duration of program effects. There is no dispute about whether programs have immediate or short-term effects on children, but there are disputes about the importance of the effects and whether they persist or result in other long-term effects that are more consequential (Jacobson 2001; Haskins 1989; Herrnstein and Murray 1994; Woodhead 1988; Zigler and Freedman 1987; Ramey and Ramey 1992).

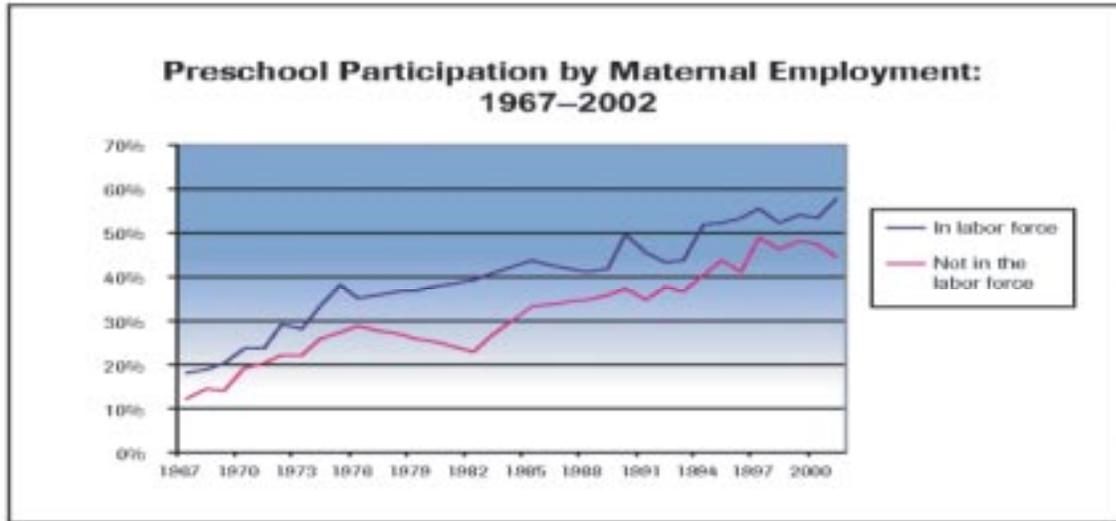
SHORT TERM EVIDENCE

Many studies have been conducted on the immediate and short-term effects of preschool programs. Most of this research is found in two largely separate but related literatures, one on educational interventions and the other on child care. Traditionally, these literatures have focused on different questions with different populations and have had different theoretical and methodological orientations. In recent years, there has been some convergence (Barnett 2003).

Early Intervention Studies

Most of the educational interventions have been half-day or school-day programs over a school year targeting children who are economically disadvantaged or otherwise at elevated risk of educational failure. Typically these efforts begin at age three or four. In a few studies the interventions began before age one and provided services for up to 10 hours per day year-round (these programs combine effective child care with education). Some other intervention programs worked primarily in the home, seeking to change parent behavior in ways that would improve child development. Interventions have in some cases combined both center-based and home-based approaches (Barnett 1998; Bowman, Donovan, and Burns 2001).

Figure 1



Source: Current Population Survey (C.P.S.) 1967-2002
 Data for the following years have been interpolated: 1977-1981, 1983, 1984 and 1986

The early intervention literature has focused on looking for positive effects on child development. There are literally hundreds of studies of immediate effects, and their findings have been conveniently summarized in both quantitative meta-analyses and traditional literature reviews (Guralnick and Bennett 1987; McKey et al. 1985; Ramey, Bryant, and Suarez 1985; White and Casto 1985). Across these studies, the average initial effect on cognitive abilities is about 0.50 standard deviations, seven or eight points on an IQ test. Average effects on social and emotional outcomes also were positive, though somewhat smaller, 0.25 to 0.40 standard deviations. Little evidence of negative effects is found in these studies. Similar results are found across studies employing a wide variety of research designs, including randomized trials and single-subject designs in which the “treatment” was experimentally manipulated.

Child Care Studies

Research on child care has tended to study 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 (Scarr and Eisenberg 1993).

Child care has not proved as detrimental as some predicted, but long hours have been found to produce small negative effects on child–mother attachment and social behavior, particularly aggression (Barnett 2004; Lamb, Sternberg, and Ketterlinus 1992; Scarr and Eisenberg 1993; Vandell 2004). These negative findings should be viewed with caution: Some researchers question the conceptualization and measurement of attachment, the behaviors of most children in child care remain in the normal range, and negative effects on behavior do appear to persist past the first few years of school (Barnett 2004; Scarr and Eisenberg 1993; Prodroidis et al. 1995; Burchinal 1999; Howes et al. 1988; Borge and Melhuish 1995; Belsky 2001; Vandell 2004). Center-based programs also have been found to produce small, positive effects on cognitive development. Positive effects generally have not been found for other forms of child care such as family home day care.

LONG-TERM EVIDENCE

The case for significant economic returns from investing in preschool education rests not on the short-term research, but on fewer than 40 long-term studies conducted since 1960. Three with the longest follow-ups

have been subject to benefit–cost analysis. Barnett (1998) reviewed 36 of these studies with follow-ups through at least the third grade. This includes 15 studies of small-scale “model” programs and 22 studies of large-scale public school and Head Start programs. The pattern of evidence from these studies is complex. Most fail to find persistent effects on IQ. Some, but not all, find persistent effects on achievement test scores. Many find effects on academic success as measured by grade repetition and special education placements. Very long-term follow-ups have consistently found increases in high school graduation rates. Whether or not a study finds positive lasting cognitive effects primarily depends on differences in research methods, with several common flaws accounting for failure to find lasting effects.

Fewer studies have examined long-term effects on social and emotional development. Most of these have found persistent positive effects on social behavior. None have found persistent negative effects on social behavior. Beyond improvements in classroom behavior and juvenile delinquency, several studies have found substantial decreases in adult crime. Whether or not studies find lasting social and emotional effects appears to depend on policy-relevant differences across studies rather than methodological differences. These are discussed at length later in this paper.

Although the types of effects produced do not differ for the most part between the two categories of long-term studies reviewed, the magnitude of effects does appear to differ. Barnett (2002) compares the average effects of small-scale and large-scale programs on grade repetition and special education placements (Barnett 2002; Vandell 2004). These two outcomes are directly comparable across a substantial number of studies. As shown in table 1, the small-scale studies report much larger effects, though the large-scale study effects are still

substantial. The reasons for this difference in effectiveness are difficult to isolate as the small-scale programs are higher in quality and serve more seriously disadvantaged populations (who have higher base rates of these problems).

Cost–benefit analyses have been conducted using data from three studies that followed children from the preschool years into adulthood. All three analyses find positive net benefits. The two that focus on part-day programs at ages three and four are found to produce benefits far in excess of cost. The study that focuses on a program that provided education in the context of full-day child care from the age of six weeks to kindergarten entry found that benefits exceed cost, but not by such a large a margin. In the case of the Perry Preschool study, the corresponding internal rate of return has been calculated to be a real rate of 16 percent. This is more than double the historic rate of return to private equities. Moreover, there are many reasons to believe that these analyses actually underestimate the returns. The studies and their findings are summarized in table 2.

The evidence reviewed above leaves little doubt that preschool 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. Yet, the evidence also raises concerns that such gains will not be realized when public policies are brought to scale. Not all studies have found the same results. Moreover, the continued poor educational outcomes of children in poverty raises questions about the effectiveness of current programs—the federal Head Start program serves more than 900,000 children at a cost of \$7 billion per year, state and local governments spend several billion dollars on their own prekindergarten programs, and the federal government and states allocate billions more to subsidize child care (Barnett et al. 2004; Barnett and Masse 2003).

TABLE 1: PERCENTAGE POINT DECREASE IN SPECIAL EDUCATION AND GRADE RETENTION, BY PRESCHOOL PROGRAM TYPE

Outcome measure	Model programs			Head Start/public school		
	Mean	SD	N	Mean	SD	N
Special education	19.6**	14.6	11	4.7**	5.3	9
Grade repetition	14.9*	9.8	14	8.4*	5.4	10

* $p < .01$, two-tailed t test with unequal variances; ** $p < .05$, two-tailed t test with unequal variances.

TABLE 2: THREE BENEFIT–COST ANALYSES

	High/Scope Perry Preschool	Carolina Abecedarian	Chicago Child- Parent Centers
Year began	1962	1972	1985
Location	Ypsilanti, MI	Chapel Hill, NC	Chicago, IL
Sample size	123	111	1,539
Research design	Random assignment	Random assignment	Matched neighborhood
Ages	Ages 3–4	Six weeks to age 5	Ages 3–4
Program schedule	Half-day, school year	Full-day, year-round	Half-day, school year
Findings			
Increased IQ short term	Yes	Yes	Not measured
Increased IQ long term	No	Yes	Not measured
Increased achievement long term	Yes	Yes	Yes
Special education	37% v. 50%	25% v. 48%	14% v. 25%
Retained in grade	35% v. 40%	31% v. 55%	23% v. 38%
High school graduation	65% v. 45%	67% v. 51%	50% v. 39%
Arrested by 21	15% v. 25%	45% v. 41%	17% v. 25%
Benefit–Cost results			
Cost	\$ 16,264	\$ 36,929	\$ 7,417
Benefit	\$277,631	\$139,571	\$52,936
Benefit/cost ratio	17.07	3.78	7.14

IMPROVING RETURNS

The major potential determinants of the effectiveness and economic returns of a preschool program can be characterized as 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. Although much remains to be learned, existing research provides insights into the importance of each of these potential determinants of impact and returns.

Person

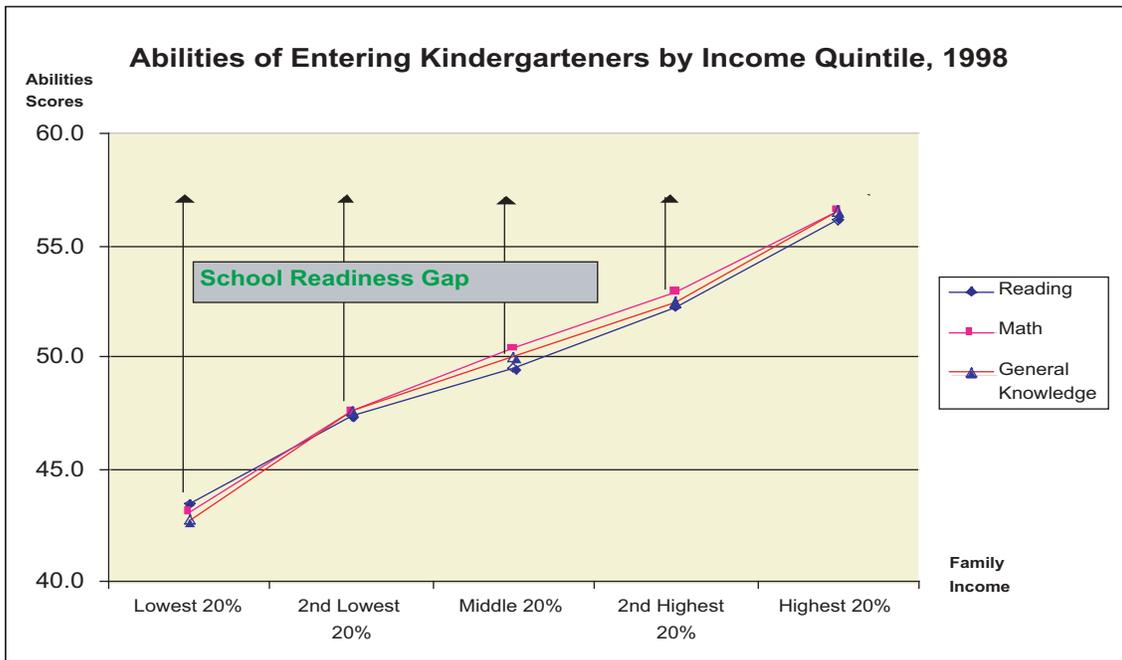
Most studies of program impact have focused on low-income populations with a high percentage of minority children. These populations have relatively high levels of the problems that preschool programs seek to address and that account for much of the economic return: low cognitive and social skill levels at entry to kindergarten, high rates of grade repetition and special education placements, low rates of high school graduation, low earnings, and high crime rates. In addition, some studies of the effects of variations in child care

quality on children's development have found larger effects for more disadvantaged children. This is consistent with the view that preschool programs' added resources yield the largest gains for children whose families have the least capacity for investment.

Research on the prevalence of educational problems among children generally is suggestive, also. As illustrated in figures 2 and 3, the relationship between family income and children's social and cognitive abilities at school entry is nearly linear. If it is assumed that families in the top 20th percentile for income provide optimally for the development of their children, then children at the median income are approximately half as far below "optimal" development as children from families in the bottom 20th percentile. Similarly, table 3 shows that the problems of grade repetition and high school dropout are roughly half as prevalent among children from middle income families as they are among children from families in the bottom 20th percentile.

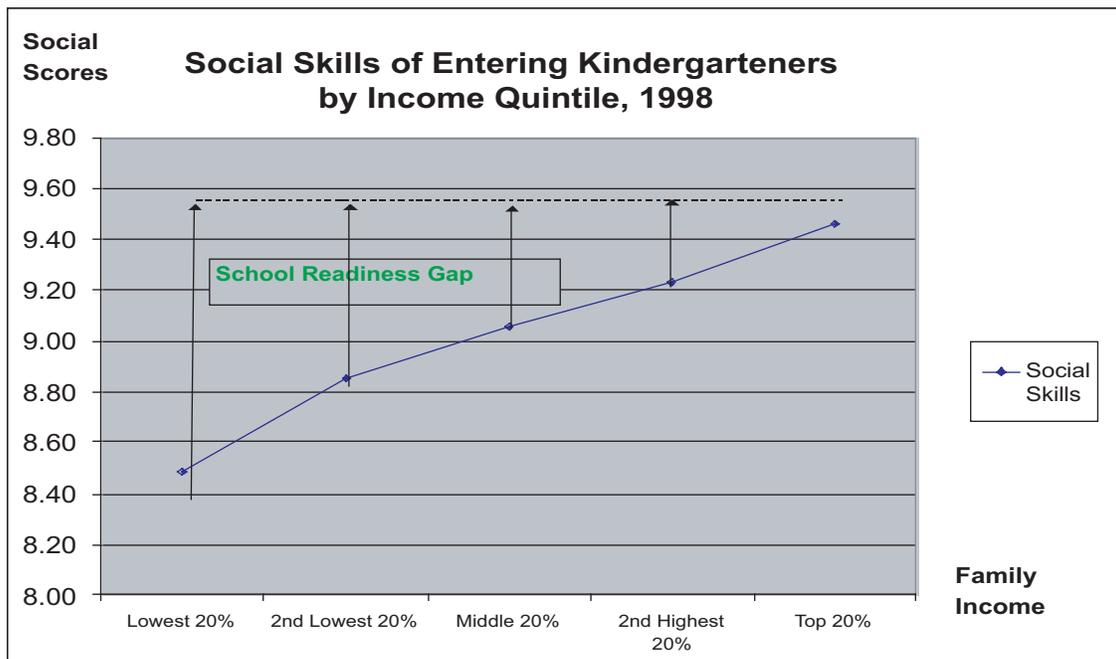
These data suggest that programs targeting children in poverty will have the largest returns and that returns decline more or less continuously with income. They

Figure 2



Source: Barnett, W.S., Brown, K., and Shore, R. (April, 2004). The universal v. targeted debate: Should the United States have preschool for all? *Preschool Policy Matters, Issue 6*. New Brunswick, N.J.:NIEER.

Figure 3



Source: Barnett, W.S., Brown, K., and Shore, R. (April, 2004). The universal v. targeted debate: Should the United States have preschool for all? *Preschool Policy Matters, Issue 6*. New Brunswick, N.J.:NIEER.

also suggest that the average return for the middle class might be half that for children in poverty. If so, the impacts on middle-class children would be sufficiently large to justify investing in public preschool programs for them, as well.

When choosing between targeted and universal approaches, policy makers also must take into account the costs and imperfections of targeting on a large scale. It is particularly difficult to target education programs on poor children because education must be delivered continuously over a substantial period of time to be effective, but poverty is a status that changes frequently. For example, surveys find as many as half of the children enrolled in Head Start are not poor, while most children in poverty are not in Head Start. Targeting imperfections could account for some of the difference in impacts between large-scale and small-scale programs. Of even more importance, benefits for most of the target population are lost because they are not actually served by targeted programs. By contrast, universal education programs miss few children in poverty.

TABLE 3: GRADE REPETITION AND DROPOUT RATES, BY INCOME

Income	Retention	Dropout
Lowest 20%	17%	23%
20%–80%	12%	11%
Highest 20%	8%	3%

Source: U.S. Department of Education, National Center for Education Statistics, 1997, *Dropout Rates in the United States, 1995*; figures are multiyear averages.

Targeting a program on children at risk of school failure is costly and imperfect. In fact, it may be so costly and imperfect that the costs exceed the benefits. Table 4 presents cost–benefit comparisons of targeted and universal programs using the results of the Perry Preschool study and simple but realistic assumptions about program participation and extrapolated benefits. These comparisons use a real discount rate of 7 percent.

Assumptions for each policy alternative are as follows. The targeted program serves 20 percent of the population in each age cohort. This roughly equals the percentage of preschool children in poverty nationally. However, the targeted program enrolls only half of the poor population; the other half of the children enrolled are nonpoor. This is comparable to Head Start. Benefits

for nonpoor children in the targeted program are assumed to equal half the benefits for poor children. Two universal scenarios (A and B) are considered. In both, all children in poor families (bottom 20 percent) and the middle class (20th–80th percentile for income) are enrolled, and half of the top 20 percent are enrolled. Benefits for children in the top 20 percent are assumed to be zero for this example. In A, middle-class children are assumed to generate benefits equal to half that for poor children. In B, middle-class children are assumed to generate only enough benefits (one-sixth those of poor children) to offset cost. Remarkably, even under B, the universal program still has a higher net present value. Clearly, targeted programs need not be more efficient than universal programs.

PROCESS

Preschool programs vary tremendously in their quality and quantity, much more so than elementary schools. There is abundant evidence that this impacts their educational effectiveness and that the vast majority of preschool programs are educationally weak (Helburn and Howes 1996; Barnett 2004; Peisner-Feinberg et al. 1999). Program effectiveness could be significantly improved if programs were more closely aligned with models found to be highly effective. In addition, further improvements in effectiveness could be achieved by systematically varying public programs to investigate the impacts of program characteristics that are relatively easy for policy to manipulate.

Quality

As discussed earlier, small-scale model programs had significantly larger impacts than large-scale public programs on children’s learning and on later school success. On the whole, the small-scale programs had better qualified and compensated teachers, smaller classes, and higher teacher–child ratios. In addition, it seems likely that they had stronger supervision and more systematically engaged in reflective teaching and teacher–child interactions similar to those that children would encounter in the elementary school (Frede 1998). These advantages in practice were facilitated by teacher (and supervisor) quality and ratios that made intensive individualization possible.

The contrast between the programs found to be most effective and current policy is stark (Barnett et al. 2004; Barnett 2003a, 2003b). The typical teacher in a small-scale program had a college degree and received

TABLE 4: COSTS, BENEFITS, AND NET PRESENT VALUE OF RETURNS TO TARGETED VERSUS UNIVERSAL PREKINDERGARTEN

Family economic classification	Number of children	Cost (billions)	Benefit (billions)	Net present value (billions)
Targeted Preschool Program				
Low	383,871	\$ 5.5	\$ 34.3	\$ 28.8
Middle	383,871	5.5	17.2	11.6
High	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	767,742	\$ 11.0	\$ 51.5	\$ 40.5
Universal Preschool Program: Scenario A				
Low	767,742	\$ 11.0	\$ 68.6	\$ 57.6
Middle	2,303,226	33.1	103.0	70.0
High	<u>383,871</u>	<u>5.5</u>	<u>0</u>	<u>-5.5</u>
Total	3,454,839	\$ 50.0	\$ 172.0	\$ 122.0
Universal Preschool Program: Scenario B				
Low	767,742	\$ 11.0	\$ 69.0	\$ 58.0
Middle	2,303,226	33.1	33.1	0
High	<u>383,871</u>	<u>5.5</u>	<u>0</u>	<u>-5.5</u>
Total	3,454,839	\$ 50.0	\$ 102.0	\$ 52.1

compensation equivalent to that in the public schools. The teacher-child ratio frequently was 1:7 or less and group size usually was 15 or less. Yet, today most preschool teachers in the United States do not have a college degree and their average pay is half that of K-12 teachers. The federal Head Start program requires only that half the teachers (nationally) have a two-year degree, and teacher pay is correspondingly low. Only 23 states require that teachers in state-funded prekindergarten programs have a four-year college degree and only 13 require a college degree and certification in preschool education. Class size and ratios are highly variable. One teacher and an assistant (with no more than a high school diploma) to 20 children is a common requirement. No state requires that teachers in child care have a college degree, and childcare class size and ratio requirements are even more lax than for state-funded prekindergarten programs.

The disparities in program characteristics outlined above seem more than sufficient to explain why current programs do not replicate the results of highly effective programs. It also would explain why estimated effects

tend to be largest for state prekindergarten programs, and smallest for center-based child care programs. Studies find no benefits from family home child care as opposed to center-based programs. More specific guidance can be obtained from studies that focus on the effects of teacher qualifications, class size and ratio, and curriculum. Note that such effects are unlikely to be independent. For example, a strong curriculum is difficult for poorly educated teachers to implement.

Numerous studies of the effects of preschool teacher qualifications indicate that both general education and specific training in the education of young children influence teaching quality and children's learning and development (Barnett 2003b). A meta-analysis of this literature finds an average effect size of .16 for teachers with a bachelor's degree (18 studies) and an average correlation of .21 (15 studies) with years of education, where the outcomes are either teaching quality or child progress (Kelly and Camilli 2004). Note that the situation in preschool education is quite different from that in K-12, as the issue there typically revolves around whether a master's degree contributes to teacher effectiveness over a bachelor's

degree (as opposed to a bachelor's degree over a high school diploma or associate's degree).

Research on class size and ratios has found that smaller classes and better ratios are associated with better teaching and improved outcomes for children (Barnett, Schulman, and Shore 2004). When classes and ratios are more favorable, teachers engage in more stimulating, responsive, and supportive interactions, more individualized attention, and more dialogues; and they spend less time managing behavior and more time in educational activities. Studies finding smaller class sizes lead to better test scores include randomized trials at the preschool and kindergarten level. An overview of the evidence suggests that substantial effects of class size may be obtained only when classes are reduced to 15 or fewer children (or the equivalent ratio).

Research on the effects of curriculum, including long-term randomized trials, has produced a number of important findings (Schweinhart and Weikart 1997). One is that direct instruction has larger short-term effects on cognitive test scores, though these extra gains do not necessarily persist. Another is that direct instruction fails to produce positive effects on social and emotional development. As the social and emotional gains can account for most of the economic return, it is essential for economic efficiency that they not be sacrificed for somewhat higher test scores. Thus, it is important that preschool programs have a balanced curriculum that produces substantial increases in academically important knowledge and skills and in social and emotional skills. Important aspects of cognitive and social development that may influence success in and out of school include self-regulation, getting along with others, the ability and inclination to plan and take responsibility, positive attitudes toward school and other social institutions, and creative problem solving.

Research also provides a fair number of studies that can inform policy about what does not work. Multiple randomized trials have found that attempts to intervene through comprehensive social and educational services have had little or no positive effects. The Comprehensive Child Development Program (CCDP) was found to produce small effects on some parent behaviors and child development (an effect size of 0.10) at age two and no meaningful effects at age five (St. Pierre and Layzer 1999; Vandell 2004). Studies of the Avance family support program, Child and Family Resource Program, and New

Chance failed to find significant effects on child development (St. Pierre, Layzer, and Barnes 1998). Research on Even Start found small effects, at best, on children (St. Pierre et al. 1998). Early Head Start (a birth to age 3 program) was found to produce small effects on child and parent outcomes (Love et al. 2001). One explanation for these findings is that even fairly expensive programs that seek to provide comprehensive services to children and families end up delivering weak, diffuse services that may duplicate much of what is available elsewhere.

Home visit programs also have generally failed to influence parenting and improve children's cognitive development (Scarr and McCartney 1988; Levenstein, O'Hara, and Madden 1983). Two randomized trials on Parents at Teachers (PAT) found small and inconsistent effects on parenting knowledge, attitudes, and behavior and no effects on child development (Wagner and Clayton 1999). A randomized trial of the Home Instruction Program for Preschool Youngsters (HIPPI) found significant effects on cognitive development for one cohort, but not another (Baker, Piotrkowski, and Brooks-Gunn 1999). A randomized trial comparing full-day, year-round educational child care plus home visits to parent education alone and to no treatment found equivalent outcomes for home visits and no treatment (Wasik et al. 1990). A randomized trial of home visits in Head Start found no effects on home environment or child development (Boutte 1992). One potential explanation is that home visits may have to be much more frequent than is usually the case to be effective (Powell and Grantham-McGregor 1989; Gomby, Culross, and Behrman 1999).

Studies of home visitation and comprehensive services approaches strongly suggest that attempts to influence child development through parents are relatively weak. A fairly intensive level of direct service may be required to produce substantial effects on children's cognitive development, in particular. However, further research is warranted on the circumstances under which parent-directed programs might be highly effective (Kagitcibasi 1997; Barnett, Escobar, and Ravsten 1988; van Tuijl, Leseman, and Rispen 2001). Relatively intensive nurse home visitation programs beginning during pregnancy have had substantive impacts on children and families, with small effects on cognitive outcomes. New studies should carefully document cost; home visit programs can be much more expensive than is commonly supposed (St. Pierre et al. 1998).

Quantity

Isolating the effects of the age at start and the duration of preschool education is difficult given the myriad ways in which the intensity and other characteristics of programs vary. In addition, there is considerable uncertainty about how to measure quantity. Simply comparing the number of hours across programs that differ in the number of days or even years across which those hours are spread seems unsatisfactory. Some of the more effective models have delivered relatively few hours—the Perry Preschool program provided two and a half hours per day plus weekly home visits with children and their parents. No direct experimental comparisons reveal the impacts of additional hours per day or beginning the program at age four rather than age three. Kindergarten studies suggest a cognitive advantage for full-day over half-day programs. Some 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 (Sammons 2002a, 2002b).

One finding that stands out is that only programs beginning with infants and continuing up to age five have demonstrated permanent (albeit modest) increases in IQ. These programs also produce quite large gains in achievement and school success. As these programs provided child care, they operated full-day, year-round and provided a large number of hours of services. Clearly, such programs are much more expensive. Having relatively few studies of high-quality birth-to-age-five interventions and lacking true experimental comparisons with shorter programs, it is difficult to assess marginal benefits relative to the marginal costs. For those children already in child care, it is the extra cost of providing educational quality that is relevant, not total cost of the program.

The fact that child care is a joint product with education complicates matters with respect to the effects of length of day and (to a lesser extent) days per year. Whether or not they influence child development, the hours of operation influence parental willingness to send their children. Many working parents find it difficult to transport their children to and from part-day programs and to obtain alternative child care arrangements for the rest of the day and for work days when school is not in session. When preschool offerings are limited to two to three hours on school days some parents will send their children elsewhere, forgoing the child development benefits (Barnett et al. 2001).

Context

The impacts of preschool education can vary with the broader contexts within which children live and programs operate. The most obvious source of variation is where K–12 policies directly affect the outcomes targeted by preschool education. For example, if a school district has a policy that no children will be retained in a grade, then there will be no effects on grade repetition. If a community has very little crime and violence, the baseline rates may be so low that even very disadvantaged children have limited involvement with crime. Conceivably, a K–12 education system may be so weak that children who enter kindergarten advantaged by preschool education can obtain no support to maintain those gains. The results of the Perry and Chicago studies and many others suggest that this may be of more theoretical than practical concern (Barnett 2002).

Nevertheless, there may be reason for concern that bureaucratic inertia and special interest groups can limit the realization of benefits from large-scale preschool programs. When preschool programs reduce the need for grade repetition and special education, there may be some tendency for schools to find students to fill the classes and employ the current configuration of teachers and support staff. There may be a reluctance to cut back on law enforcement and prisons, so that harsher sentences might result as space becomes available. Although it is difficult to address the issues outside of education, it should be easier to coordinate K–12 policy so that large reductions in grade repetition and special education are realized.

Finally, large-scale preschool education, particularly universal programs (at least within a school district), might be expected to produce larger gains because of peer effects (Barnett 1996; Schecter n.d.). If everyone in a classroom has attended preschool, classroom climate will change, median ability will rise, and dispersion in ability will narrow (those at the bottom gain most). This would make teaching easier and children would be likely to gain from the improved peer interactions. This kind of general equilibrium effect might have consequences beyond the classroom, and how large these would be could depend on whether there are critical “tipping points” for peer effects and whether these are reached.

DISCUSSION

The evidence for potentially large returns to preschool education stands in stark contrast to the evidence of actual performance for many of our preschool programs, private as well as public. The contrast in program quality is equally stark and seems likely to explain much of performance gap. Currently, the nation invests too little in providing children who can benefit the most with access to preschool education and in ensuring that the programs accessed are of optimal quality.

The poor quality of most private preschool programs is more than readily explained by market imperfections that afflict preschool education. The externalities are extremely large, both in absolute terms and as a percentage of benefits to be obtained, so that the private incentives to purchase high quality are far lower than is consistent with the social benefits. As agents for their children, parents face serious impediments to making optimal investments. They do not appear to be good judges of quality, and the service they purchase is difficult for them to directly observe (and their children are too young to deliver reliable reports on quality). For any individual parent there is a risk that the benefits will be lost because of later events that can override the modest effects of preschool education (as well as death of the parent or child), and these risks seem likely to be higher for low-income families. In addition, there are limits to parental altruism and some behavioral economics would suggest that returns 20 to 40 years in the future may be seriously undervalued in parental decision making.

Public action is needed to produce more optimal investments in the education of young children, but currently falls short of ensuring that the kinds of returns that are possible are actually delivered. Given their relatively low costs, Head Start and state prekindergarten programs might pass a simple cost–benefit test. Most publicly subsidized child care programs would not; funding increases have emphasized quantity and neglected quality. There are very large additional gains to be had at modest additional costs by moving the quality of all of these programs in the direction indicated by model programs that produced much higher returns

Most public support for preschool education targets children in poor or low-income families. This is consistent with evidence that returns are higher for public investments in the education of these young children. However, targeting proves to be highly inaccurate in

practice, particularly with respect to a status that changes fairly frequently and a service that must be provided consistently over a sustained time. Moreover, substantial benefits to children’s learning and development extend far up the income ladder. Thus, targeting may not be an economically efficient strategy. Obviously, this need not imply free public preschool education for all—options for cost sharing include sliding fee scales, including those for only hours beyond a core educational part of the day. Nevertheless, a number of states are moving in the direction of offering free public education beginning at age four, and it is possible that this policy is more efficient than offering a targeted program.

In an era when mandated achievement tests are increasingly seen as the key to driving more efficient public education, preschool studies suggest caution on at least one point. The economic benefits from improvements in social and emotional development may be larger than those from improvements in cognitive development. While the latter should not be neglected, a balanced curricular approach is required to obtain large gains in both. The approach that maximizes test score gains may minimize social and emotional gains. If test scores alone, or even primarily, drive preschool education practice, the results could be highly inefficient. It may be possible to introduce valid assessments of social and emotional development (adding physical might be useful as well given concerns with obesity) to accountability systems. However, the extent to which accountability systems actually provide unbiased estimates of program performance is highly questionable.

Economic returns are to some extent dependent on context. Much of the social and economic context for preschool education is beyond the control of policy makers. Even that which is not may be much more heavily influenced by other considerations. Still, some aspects of K–12 education policy should be carefully examined for alignment with preschool education policy. Where high-quality preschool programs are introduced on a large scale, K–12 education should be expected to substantially reduce grade repetition and special education places, particularly for children from low-income families. Prohibiting grade repetition in all but a few rare cases may be a sensible response. Finding the appropriate policy response with respect to special education will be more complex.

Finally, although it is clear that preschool programs should move in the direction of higher-quality, more intensive education, much remains to be learned about exactly where programs should be moved. Moreover, the optimal quantity and quality of preschool education may differ among children and communities. Substantial progress toward providing policy makers and parents with better information could best be obtained by systematically experimenting with alternative hours, staffing,

ratios, group sizes, and other aspects of programs. The federal and state governments could easily conduct such experiments in ways that allow for the interaction of person, process, and context. Making such studies a regular part of program operation would create a system for permanent improvement and response to change that is missing from public education for older children.

ENDNOTE

¹A substantial portion of the Abecedarian control group attended child care so that the analysis to some extent captures the marginal benefits of the treatment above usual child care.

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