

Costs, Benefits, and Long-Term Effects of Early Care and Education Programs: Recommendations and Cautions for Community Developers

W. Steven Barnett and Debra J. Ackerman

Participation in early care and education (ECE) programs has become the norm for this nation's three- and four-year olds. Public investments in such programs have been promoted on the grounds that they can produce high rates of return in the form of academic outcomes, greater employment rates, and reduced crime. Yet, potential gains are not always realized, as benefits and costs depend on who is served by the program, the activities provided, and the resources required to produce such activities. This paper reviews the basis for claims related to the costs, benefits, and long-term effects of ECE programs, including effects on children's learning and development and parental earnings. It also summarizes what is known about the extent to which variations in child and program characteristics and the community context alter the magnitude of benefits from ECE, as well as policy choices that could increase educational gains and other benefits, thereby increasing the return on public investments.

Keywords: *early care and education; cost-benefit analysis; early care and education outcomes; early care and education quality*

In 1965, just 5% of three-year olds and 16% of four-year olds were enrolled in some type of early care and education (ECE) program. Today, those percentages have more than quadrupled, with young children enrolled in a wide variety of programs, including home- and center-based child care, preschool for three- and four-year olds, Head Start, and state-funded prekindergarten. Although increased maternal labor force participation plays some role in this trend, enrollment rates overall have increased at roughly the same pace whether or not the mother is in the labor force (Barnett & Yarosz, 2004). Much of the increase has been privately funded, but public sector expenditures have also increased substantially. For example, the federal Head Start program serves over 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 & Masse, 2003; Barnett, Hustedt, Robin, & Schulman, 2004).

W. Steven Barnett is the Director of the National Institute for Early Education Research (NIEER). Debra J. Ackerman is a NIEER Research Associate. Their work on this article was partially funded by The Pew Charitable Trusts. The opinions expressed are those of the authors and do not necessarily reflect the views of The Pew Charitable Trusts. Contact information: W. Steven Barnett, National Institute for Early Education Research, 120 Albany Street, Tower 1, Suite 500, New Brunswick, NJ 08901. Telephone: 732.932.4350, ext. 228. E-mail: sbarnett@nieer.org. Debra Ackerman, National Institute for Early Education Research, 120 Albany Street, Tower 1, Suite 500, New Brunswick, NJ 08901. Telephone: 732.932.4350, ext. 233. E-mail: dackerman@nieer.org.

While many of these programs are predicated on the assumption that participation can improve children's short- and long-term social and academic competence, the results have been far from uniform. As implied by the variety of terms that comprise the broader ECE milieu, the emphasis within many programs has been on either providing care for the children of working parents or enhancing children's early education and development (Brauner, Gordic, & Zigler, 2004), rather than a seamless system that can provide both (Stoney, Mitchell, & Warner, this volume). Programs also vary widely with respect to quality (Early et al., 2005; Peisner-Feinberg et al., 1999), as ECE standards are much more variable than for K-12 education and often are quite low, especially for programs under the jurisdiction of state child care regulations (Barnett & Ackerman, in press). No matter what term programs use to describe themselves, research finds wide variations in their educational effectiveness, with many having little positive effect and some negative effect on child development (Magnuson, Ruhm, & Waldfogel, 2004; Sammons et al., 2002, 2003; Vandell, 2004).

Public investments in ECE programs have been promoted on the grounds that they can produce benefits that are the equivalent of a high rate of return (Rolnick & Grunewald, 2003). Although there is no dispute about whether quality programs have immediate or short-term effects on children, there are disputes about the importance of the effects and whether they persist or result in other long-term effects that are more consequential (Haskins, 1989; Ramey & Ramey, 1992). Potential gains are not always realized, as well, as benefits and costs depend on who is served by the program, the experiences provided, and the resources required to produce such activities. Such gains are also dependant on the broader school, community, and economic contexts in which children, families, and programs are situated.

This paper reviews the basis for claims related to the costs, benefits, and long-term effects of ECE programs. It also summarizes what is known about the extent to which variations in child and program characteristics and the larger community alter the magnitude of the educational benefits from ECE initiatives. Key issues in the review are the nature and duration of both programs and their effects. As participation in ECE becomes the norm for most three- and four-year olds, the time is ripe to develop policies that significantly increase the benefits from such programs, thereby ensuring that the public reaps an adequate return on its investment. The paper therefore also offers policy recommendations and cautions likely to affect this goal. We set the stage for the discussion with a review of the benefits of ECE.

Short-Term Benefits of ECE

Many studies have been conducted on the immediate and short-term effects of ECE programs on children's cognitive and social-emotional development. Most of this research is found in the largely separate literatures on educational interventions and child care. While these literatures have focused on different questions, populations, and theoretical and methodological orientations in the past, in recent years there has been some convergence. Because of the correlation between family income and children's academic abilities upon entering kindergarten (Schulman & Barnett, 2005), most educational interventions have been half- or school-day programs over a school year targeting children who are economically disadvantaged or are otherwise at elevated risk for educational failure. Typically, these efforts began at age three or four, but in a few studies the interventions have begun before age one and provided year-round services for up to 10 hours per day by combining 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. In some cases, interventions have combined both center- and home-based approaches (Barnett, 1998).

Studies of these interventions have focused on the effects on child development. Findings regarding immediate effects have been summarized in both quantitative meta-analyses and traditional literature reviews (Guralnick & Bennett, 1987; McKey et al., 1985; Ramey, Bryant, & Suarez, 1985; White & Casto, 1985). Across these studies, the average initial effect on cognitive abilities is about 0.50 standard deviations, or 7 or 8 points on an IQ test. Average effects on social-emotional outcomes also are 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.

A recent randomized trial (Puma, Bell, Cook, Heid, & Lopez, 2005) provides the best estimates to date of the effects of one year of Head Start, which was found to produce effects of roughly .20-.33 standard deviations on cognitive and social-emotional development. While smaller than the average found in meta-analyses, these are larger than the effects of child care. This is consistent with the relative strength of standards regarding teacher qualifications, class size and ratios, and other program characteristics.

Research on child care has mostly studied the effects of typical center-based programs on the general population and relied on statistical analysis of natural variation rather than experiments. Such research has emphasized both the potential for negative influences on social and emotional development, as well as children’s cognitive development and the potential for positive effects. Child care research has also 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 & Eisenberg, 1993).

Child care has not proved as detrimental as some predicted, but generally the quality of non-parental/relative, home-based settings (also known as family child care) is low and positive effects have not been found (Loeb, Fuller, Kagan, & Carrol, 2004). Center-based child care has been found to produce small positive effects on cognitive development (Burchinal et al., 2000; NICHD ECCRN, 2004; NICHD ECCRN & Duncan, 2003; Peisner-Feinberg et al., 2001), but small negative effects on child-mother attachment and social behavior, particularly aggression (Lamb, Sternberg, & Ketterlinus, 1992; Scarr & Eisenberg, 1993; Vandell, 2004). These latter findings should be viewed with caution, as some researchers question the conceptualization and measurement of attachment. In addition, the behaviors of most children in child care remain in the normal range and negative effects on behavior do not appear to persist past the first few years of school (Belsky, 2001; Howes, Rodening, Galluzzo, & Myers, 1988; Prodroidis et al., 1995; Scarr & Eisenberg, 1993; Vandell, 2004).

Long-term Benefits for Children

The empirical case for considering the provision of ECE as an investment with significant economic returns rests largely on 38 studies with follow-ups through at least Grade 3. Fifteen of these studies focus on “model” programs developed by researchers for children ages zero to six, and the remainder report outcomes for public school and Head Start programs for three- to five-year olds.

Barnett’s (1998) review of these studies demonstrates a complex pattern of evidence. Most studies 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 few long-term follow-ups have consistently found increases in high school graduation rates. Whether or not a study finds lasting cognitive effects primarily depends on differences

in research methods, with several common flaws accounting for failure to find such effects, including selective attrition on achievement test data due to grade retention or special education placement.

Fewer studies have examined long-term effects on social-emotional development. Most of these have found persistent positive effects on social behavior, and none have found persistent negative effects. 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 by model and public school/Head Start programs do not differ for the most part, the magnitude of effects does (see Table 1). When comparing the average effects of these programs on grade repetition and special education placements—two outcomes which are directly comparable across a substantial number of studies—the public school/Head Start study effects are substantial, but the model studies report much larger effects. Although the reasons for this difference in effectiveness are difficult to isolate, it should be noted that the model programs were higher in quality and served more seriously disadvantaged populations who also have higher base rates of these problems.

Table 1. Average effects of model and public school/Head Start programs on grade repetition and special education placements

Outcome	Model Programs Estimated Effects			Public School/Head Start Programs Estimated Effects		
	M	SD	N	M	SD	N
Reduction in percent repeating at least one grade	14.9**	9.8	14	8.4**	5.4	10
Reduction in percent ever in special education	19.6**	14.6	11	4.7**	5.3	9

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

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

Source: Barnett & Camilli (2002)

Researchers (Masse & Barnett, 2002; Reynolds, Temple, Robertson, & Mann, 2002; Schweinhart et al., 2005) have conducted cost-benefit analyses using data from the only three independent studies that have followed children from the preschool years into adulthood (see Table 2). All three find positive net benefits from increased long-term academic achievement and high school graduation rates, as well as lower percentages of children placed in special education or retained in grade. Analyses focusing on the Child Parent Centers and Perry Preschool find benefits that far exceed cost. The corresponding internal rate of return for Perry has been calculated to be a real rate of 17%. This is more than double the historic rate of return to private equities. Benefits also exceed costs for the Abecedarian program, but not by such a large margin. These analyses may actually underestimate the returns.

In sum, ECE 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 raise questions about the effectiveness of current programs.

Table 2. Outcomes and cost-benefit analyses of the Perry Preschool, Carolina Abecedarian, and Chicago Child-Parent Centers programs

	Perry Preschool	Carolina Abecedarian	Chicago Child-Parent Centers
Outcomes			
Increased short-term IQ	Yes	Yes	Not measured
Increased long-term IQ	No	Yes	Not measured
Increased long-term achievement	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

Sources: Barnett (1993, 1998); Masse & Barnett (2002); Reynolds, Temple, Robertson, & Mann (2002); Schweinhart et al. (2005)

THE ROLE OF PERSON, PROCESS, AND CONTEXT IN RETURNS

The major potential determinants of the effectiveness and economic returns of ECE can be characterized as person, process, and context. Respectively, these terms refer to the population served and the program delivered, as well as the broader educational and community context in which both person and process are embedded. Although much remains to be learned, existing research provides insights into the importance of each of these potential determinants on effects and returns.

Person

One key strategy to combat poverty has been the provision of early interventions for disadvantaged children (St. Pierre, Layzer, & Barnes, 1998). Thus, most studies of program effect have focused solely on low-income populations with a high percentage of minority children. These populations have relatively high levels of the problems that educational interventions have sought to address, such as 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. Low-income populations also account for much of the economic return, as some studies of the effects of variations in child care quality on children’s development have found larger effects for more disadvantaged children.

Research on the prevalence of educational problems among children generally is also suggestive of the role that population demographics play in returns. The relationship between family income and children’s social and cognitive abilities at school entry is nearly linear. That is, 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, the problems of grade repetition and high school dropouts are roughly half as prevalent among children from middle-income families as they are among children from families in the bottom 20th percentile (Schulman & Barnett, 2005).

These data suggest that returns decline more or less continuously as income rises, and the average return for the middle class could be half of that for children in poverty. Yet, as Kimmel (this volume) and Stoney et al. (this volume) note, accessing quality ECE is a problem that affects more than just low-income families. Furthermore, middle-class children can benefit from quality ECE. For example, an evaluation of Oklahoma's universal preschool program for 4-year olds (Gormley, Gayer, Phillips, & Dawson, 2004) found substantial effects—including a .80 standard deviation gain in pre-reading and reading skills, a .65 standard deviation gain in pre-writing and spelling skills, and a .38 standard deviation gain in early math reasoning and problem-solving abilities—across all participants. The evidence indicates that this program yields the largest gains for children in lower-income families, but that gains for children who are not poor can still be quite substantial.

A recent study (Loeb, Bridges, Bossok, Fuller, & Rumberger, 2005) drawing on data from the Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999 also adds to our knowledge of the effects for middle-class children. When compared to those who received only parental care, low-income children who participated in a non-Head Start, center-based ECE program experienced the greatest gains in their early reading and math skills. However, middle-income children also experienced modest gains in comparison to their cared-for-at-home counterparts. Given the number of middle class children who come to kindergarten “not ready,” the total net benefits for this population have the potential to be much larger than those produced by programs targeting disadvantaged populations only.

Process

ECE programs vary tremendously in their overall quality, what they offer, and their hours. Research on ECE quality (e.g. Phillips, Mekos, Scarr, McCartney, & Abbott-Shim, 2000) suggests that the educational effectiveness of programs could be significantly improved if program characteristics were more closely aligned with those found in small-scale models such as Abecedarian and Perry (see Table 3). The typical teacher in these programs had a college degree and received compensation equivalent to that in the public schools. Studies of the effects of ECE 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, 2003). A meta-analysis of this literature finds an average effect size gain 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 & Camilli, 2004).

The contrast between these programs and current policy, however, is stark (Barnett & Ackerman, in press). Most teachers in privately-funded ECE programs do not have a college degree (Saluja, Early, & Clifford, 2002), and their average hourly rate of pay in 35 states is \$8.50 or less (Ackerman, 2006). Although the percentage of degreed teachers in state prekindergarten programs is higher (Gilliam & Marchesseault, 2005), their average pay is about 25% less than that of K-12 teachers (Ackerman & Barnett, manuscript in press). The federal Head Start program requires just 50% of all teachers nationally to have a two-year degree, and teacher pay is correspondingly low (NIEER, 2003). Only 18 states require teachers in all state prekindergarten programs to have a four-year college degree (Barnett, Hustedt, et al., 2004).

In addition, Abecedarian and Perry had teacher-child ratios of 1:7 or less and a group size no larger than 13. Research on class size and ratios finds that smaller classes and better ratios are associated with better teaching and improved outcomes for children. Such class

Table 3. Programmatic elements of the Perry Preschool and Carolina Abecedarian programs

	Perry Preschool	Carolina Abecedarian
Year began	1962	1972
Location	Ypsilanti, MI	Chapel Hill, NC
Sample Size	123	111
Ages Served	3 to 4	Six weeks to 5
Schedule	Half-day, school year	Full-day, year round
Maximum Class Size	13	12 (Infants) 7 (Pre-Toddlers & Toddlers) 12 (Preschoolers)
Teacher/Assistant: Child Ratio	1:6.5	1:3 (Infants) 1:4 (Pre-toddlers/ Toddlers) 1:6 (Preschoolers)
Teacher Qualifications	BA & elementary and special education certification	BA, MA, or demonstrated skills and competencies

Source: Masse & Barnett (2002); Schweinhart et al. (2005)

sizes and ratios give teachers the opportunity to engage in more stimulating, responsive, and supportive interactions, and provide more individualized attention and dialogues. Teachers also 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 (Barnett, Schulman, & Shore, 2004).

Class size and ratios are highly variable in ECE. State prekindergartens commonly require one teacher and a high school-educated assistant for every 20 children. The maximum size and ratio requirements in private child care programs are even more lax (Barnett, Hustedt, et al. 2004). In addition, it seems likely that the Perry and Abecedarian programs had stronger supervision and more systematically engaged in reflective teaching and developmentally appropriate teacher-child interactions (Frede, 1998). These advantages in practice were facilitated by teacher (and supervisor) quality and ratios that made intensive individualization possible.

Such disparities in program characteristics seem more than sufficient to explain why current programs do not replicate the results of highly effective programs. These disparities could also explain why estimated effects tend to be larger for state prekindergarten programs than for Head Start and center-based child care programs (Magnuson et al., 2004). The characteristics of highly effective programs are unlikely to be independent; for example, a strong curriculum is difficult for poorly educated teachers to implement.

Research on the effects of curriculum, including long-term randomized trials, has also produced important findings. For example, direct instruction—rather than a more child-oriented approach—has larger short-term effects on cognitive test scores, though these extra gains do not necessarily persist. Yet, direct instruction alone has failed to produce positive effects on social-emotional development (Schweinhart & Weikart, 1997). As such gains can account for most of the economic return, it is essential that they not be sacrificed for somewhat higher test scores. To be efficient, preschool programs must have a balanced curriculum that produces substantial increases in both academic knowledge and skills and in social-emotional skills. Important aspects 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, as well as positive attitudes toward school and other social institutions (Boyd et al., 2005).

Two-Generation Programs

Research also provides a fair number of studies that can inform policy about what programmatic elements do *not* produce much of an impact. For example, an additional approach to influencing children's social and cognitive development has been to provide concurrently parenting education and literacy and job training to their parents (St. Pierre et al., 1998). However, multiple randomized trials have found such interventions have had little or no positive effects. The Comprehensive Child Development Program was found to produce small effects (0.10) on some parent behaviors and child development at age 2, but no meaningful effects at age 5 (St. Pierre & Layzer, 1999). Studies of three additional support programs failed to find significant effects on child development (St. Pierre et al., 1998). Research on Even Start found small effects, at best, on children (St. Pierre et al., 1998), and Early Head Start 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 services to both children and families end up delivering weak, diffuse services that may duplicate much of what is available through already-existing private or public community services.

Similarly, studies have found that home visit programs generally have had at best very small effects on parenting and children's cognitive development (Scarr & McCartney, 1988; Levenstein, O'Hara, & Madden, 1983). Two randomized trials on Parents as Teachers found small and inconsistent effects on parenting knowledge, attitudes, and behavior, and no effects on child development (Wagner & Clayton, 1999). A randomized trial of the Home Instruction Program for Preschool Youngsters found significant effects on cognitive development for one cohort, but not another (Baker, Piotrkowski, & Brooks-Gunn, 1999). An additional randomized trial comparing full-day, year-round educational child care plus home visits to parent education alone or no treatment found equivalent outcomes for home visits and no treatment (Wasik, Ramey, Bryant, & Sparling, 1990). Home visits in Head Start had no effect on home environment or child development in an additional randomized trial (Boutte, 1992). One potential explanation for these findings is that home visits may have to occur more frequently than is usually the case to be effective (Gomby, Culross, & Behrman, 1999; Powell & Grantham-McGregor, 1989).

Studies of two-generation 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, & Ravsten, 1988). Relatively intensive nurse home visitation programs beginning during pregnancy have had substantive impacts on children and families, though effects on children's development have been small, under .20 standard deviations (Olds et al., 2004).

Quantity

Kindergarten studies suggest a cognitive advantage for full-day over half-day programs (Ackerman, Barnett, & Robin, 2005), thus an additional variable that would seem to contribute to effectiveness is the amount of time children spend in an ECE program. Yet, isolating the effects of the age at start and duration of ECE is difficult given the myriad ways in which intensity and other program characteristics vary. Measuring quantity is also complicated. 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 2 ½ hours per day plus weekly home visits with children and their parents (Schweinhart et al., 2005). 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 et al., 2002, 2003). No direct experimental comparisons are available on the impacts of beginning preschool at age four rather than age three.

A recent study (Robin, Frede, & Barnett, 2006) comparing outcomes for children in an 8-hour per day, 45-week preschool program with those in a 3-hour per day, 41-week program suggests scheduling does matter. Both programs were located within public schools in one urban school district in New Jersey and utilized the same curriculum. In addition, both were staffed by a certified teacher and an aide and had similar group sizes, teacher-student ratios, and classroom quality. This study found that participation in full-day, extended year preschool led to significantly larger gains in children's vocabulary and early math skills scores over several years.

One further finding that stands out is that only programs beginning with infants and continuing up to age five have demonstrated permanent increases in IQ. As these programs also provided child care, they operated on a full-day, year-round basis 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 five interventions and lacking true experimental comparisons with shorter programs, it is difficult to assess marginal benefits relative to the marginal costs. However, policymakers must be mindful that for those children already in child care, it is the extra cost of providing educational quality that is relevant to obtaining child development gains, not the total cost of the program.

Context

Community-level factors, such as population demographics, economic opportunities, and institutional capacities, can influence the intended effects of a wide variety of initiatives (Connell, Kubisch, Schorr, & Weiss, 1995). Likewise, the impacts of ECE can also vary according to the broader contexts within which children live and programs operate. For example, 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. ECE programs might therefore have little impact on crime rates, as was the case with Abecedarian (Clarke & Campbell, 1998).

Large-scale preschool education for four-year olds—particularly universal programs within a community—might be expected to produce larger gains because of peer effects (Barnett, 1996; Schecter, unpublished). That is, if everyone in a kindergarten or first grade classroom has attended preschool, classroom climate will change, median ability will rise, and dispersion in ability will narrow, with those at the bottom gaining most. Preliminary results from a study examining the effects of Georgia's universal preschool program (Henry et al., 2005) support this hypothesis. Presumably, such effects will make teaching easier, and children would be likely to gain from their improved peer interactions. This kind of general equilibrium effect might have additional consequences beyond the classroom. How large these would be could depend on whether there are critical "tipping points" for teaching and peer effects and whether these are reached.

The most obvious source of variation is where K-12 policies directly affect the outcomes targeted by a preschool program. For example, a K-12 education system may be so weak that children who enter kindergarten advantaged by preschool participation receive little support to maintain those gains. If a school district has a policy that no children will be retained in grade, then there will be no effects on grade repetition. Alternatively, 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. State policymakers may be reluctant to cut back on law enforcement and prisons, so that harsher sentences might result as space becomes available. Although it is

difficult to address issues that fall outside of education, it should be easier to coordinate K-12 policy so that substantial reductions in grade repetition and special education are realized.

Impact of ECE on Parental Earnings

A less-explored outcome of ECE is the effect on parental earnings. Of course, just as the effects of ECE depend on community-level factors, an individual's earnings also depend on the confluence of skill, training levels, and labor market opportunities (Levin & Kelley, 1994). Yet, if parents of infants, toddlers, and preschoolers do not have access to acceptable child care arrangements, earnings will also be stymied. As Kimmel and Meyers & Jordan note in this volume, this context may be particularly true for lower-income, single mothers. Free ECE programs can increase parental earnings by facilitating employment or education and training. Parent participants in the Abecedarian program had access to full-day, year-round child care. Participation reduced the opportunity costs of attaining additional education and hours of employment for children's primary caregivers. The long-term benefits to these caregivers included higher earnings of approximately \$3,085 per year (Barnett & Masse, in press).

There are two potential constraints to realizing this benefit on a broader basis. The first relates to program schedule. As Kimmel (this volume) notes, unexpected child care problems can cause work disruptions for parents. Furthermore, many Head Start programs and most state prekindergartens operate on a part-day, academic-year basis (Barnett, Hustedt, et al., 2004). Another potential constraint is program cost. Decreased costs obtained through subsidies or tax credits can increase maternal employment, particularly among low-income mothers (Averett, Peters, & Waldman, 1997; Berger & Black, 1992; Press, Fagan, & McLaughlin, 2004). However, there is considerable uncertainty regarding the magnitude of the effects of a reduction in parental costs on labor force participation and how this participation may vary among parents. Kimmel (1998) estimates that a 10% decrease in price would increase labor force participation by 2% for single mothers and 9% for married mothers. Blau (2001) estimates that a 10% increase in price would result in a 2% decrease in maternal employment overall, but full governmental funding of child care would result in a 9.5 - 10% increase in overall maternal employment.

INCREASING RETURNS: FUTURE POLICY CONSIDERATIONS FOR COMMUNITY DEVELOPERS

The evidence for potentially large returns to ECE based on children's outcomes stands in stark contrast to the actual performance of many programs, both private and public. The contrast in program quality seems likely to explain much of performance gap, which is more than readily explained by the shortcomings of public programs, as well as market imperfections that afflict ECE in general (see Stoney et al. and Warner in this volume). In addition, parents face serious impediments to making optimal investments as agents for their children. They do not appear to be good judges of quality (Cryer & Burchinal, 1997), and the service they purchase is difficult for them to observe directly. Their children are too young to provide reliable reports on quality, as well.

Most public support for ECE focuses on the provision of preschool programs for children in poverty or low-income families. This focus is consistent with evidence that returns for public investments in the education of these children are higher. Yet, as Stoney et al. (this volume) note, the nation currently 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. In addition, targeting is highly inaccurate in practice, particularly with respect to a status (poverty and/or maternal employment) that changes

fairly frequently and a service that must be provided consistently over a sustained time. The costs associated with administering and monitoring targeted programs can also be high (Barnett, Brown, & Shore, 2004). Moreover, substantial benefits to children's learning and development extend far up the income ladder, with enrollment of children from a variety of socioeconomic backgrounds producing previously unrealized peer effects. Targeting may therefore be an economically inefficient strategy.

Obviously, this need not imply free public preschool education for all. Options for cost sharing include sliding fee scales and fees for 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 for this policy to be more efficient than offering a targeted program. This strategy might provide further benefits in terms of increasing the child care options of those currently not in the labor force, which in turn would increase benefits in terms of parental earnings.

State prekindergarten programs might pass a simple cost-benefit test given their relatively low costs (Barnett, Hustedt, et al., 2004). Most publicly subsidized child care programs might not pass such a test, as funding increases have emphasized quantity over quality. This situation can be remedied. There are very large additional gains to be had at modest additional costs by moving the quality of all these initiatives in the direction indicated by programs such as Perry and Abecedarian. Further improvements in effectiveness could be achieved by systematically varying public programs to investigate the effects of program characteristics that are relatively easy for policy to manipulate, such as hours, staffing, ratios, and group sizes. This strategy might also be beneficial given that returns depend on the interaction of person, process, and context, and thus the optimal quantity and quality of preschool education may differ among specific communities. Making planned variation studies a regular part of program operation could therefore create a system for permanent improvement and response to change within individual communities that is missing from public education for older children. Given the costs of providing quality programs and the numbers of children who could benefit from them, increased state and federal funding is crucial. At the same time, adaptation to community needs ought to make programs more effective, providing an argument for local control of such funding. However, local control can sometimes result in less-than-ideal implementation of crucial programmatic elements (Yoshikawa, Rosman, & Hsueh, 2002). Current research provides little guidance regarding which decisions should be left up to localities without also negatively influencing program effectiveness.

In an era when mandated achievement tests are increasingly seen as the key to public education that is more efficient, previous research suggests caution on at least one point. The economic returns from improvements in social-emotional development may be larger than those from improvements in cognitive development. Therefore, while increased academic achievement should be one goal, an approach that maximizes test score gains alone may minimize social-emotional gains, creating highly inefficient results.

In addition, economic returns are dependent to some extent on the social and economic context beyond the immediate community and thus also beyond policymakers' control. Even policies that remain within their control—such as K-12 policies—may be much more heavily influenced by other considerations. Still, such policies should be carefully examined for alignment with the goals of preschool. Where high quality preschool programs are introduced on a large scale, K-12 education should be expected to reduce grade repetition and special education placement substantially, 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, the returns from investing in preschool are not limited to those directly benefiting children. In addition to the savings accrued by the general public when fewer children are retained in grade, placed in special education, or fail to graduate from high school, parental

earnings have the potential to rise when ECE can also address child care needs. Scheduling and cost are two key variables if programs are to provide this type of support for employment. We do not yet have enough information to know how much needs to be invested in increased hours and decreased costs to maximize returns. Given the numbers of young children already enrolled in some type of care and education program, however, optimal policies would seem to be those that also are responsive to individual program and community needs.

We will undoubtedly see even greater levels of investment in preschool and other types of ECE over the next few years, yet increased quantity does not necessarily ensure the kinds of returns that are possible. Public action is therefore needed to produce investments that are more optimal for the education of young children, and will in turn generate long-term benefits for them, their families, and the nation.

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