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Early Care and Education as Educational Panacea: What Do We Really Know About Its Effectiveness?

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Abstract

Most young children in the United States regularly spend time in early care and education (ECE) settings. Institutionalized messages surrounding ECE claim that it has the potential to promote children's life-long success, especially among low-income children. I examine the legitimacy of these claims by reviewing empirical evidence that bears on them and find that most are based on results of a small set of impressive but outdated studies. More recent literature reveals positive, short-term effects of ECE programs on children's development that weaken over time. Efforts to support children's long-term success must extend beyond the ECE setting into elementary school.

Keywords

early care and education, early childhood, educational policy, evidence, policy, policy makers, preschool education

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At a time when close to 64% of mothers of young children are working and 63% of all young children—regardless of maternal employment—are in some form of regular nonparental early care and education (ECE), the American public has embraced ECE as a modern necessity (U.S. Census Bureau, 2008; U.S. Department of Labor, 2010). Social scientists, politicians, business leaders, and law-enforcement agencies alike sing ECE's praises for holding the potential to make a lasting difference in the lives of young children, especially those from low-income families. But, are these expectations for what ECE can do fair and appropriate? What can we expect from ECE programs for both low- and middle-income families? This article will address these questions by examining claims made about ECE's effectiveness and the empirical evidence that bears on them.

I address these questions through a "what-works" lens, with the goal of elucidating what we know about the effectiveness of ECE. I examine some of the most common institutionalized messages surrounding ECE as an educational panacea. These messages were selected to represent a wide variety of sources and to reflect widespread political, cultural, and economic perspectives on the long-term effects of ECE (see Brown & Wright, 2011, for an in-depth discussion of media messages and rhetoric pertaining to ECE). Then, I review the small body of empirical work on which these institutionalized messages are based, which consists of three seminal longitudinal studies. I find that although these studies were rigorous, their results are outdated and can only be generalized to a limited group of children. In addition, I review a larger, more recent body of literature on the developmental effects of ECE. I conclude that the evidence in support of ECE as an educational panacea is quite thin. A balanced review of the literature suggests that high-quality ECE benefits children's development in the short term, but cannot be expected to transform children's lives in the long run in the absence of additional educational and social supports.

Early Care and Education in the United States

Contemporary Landscape and Patterns of Use

Today, most children under the age of 5 with employed mothers regularly spend time in some form of nonparental ECE. Parents choose from an array of ECE settings, often piecing together multiple arrangements to accommodate busy work schedules. These range from formal arrangements, such as center-based child care, state-funded preschool, and Head Start programs, to informal, home-based arrangements provided by relatives, nannies, babysitters, and family child care providers who care for groups of children in their

homes. This mixed-delivery system of ECE services, more aptly called a *non-system*, offers a haphazard array of programs and funding streams that at times work at cross-purposes with each other (Kagan & Cohen, 1997).

Regardless of family income, most young children spend long hours in ECE settings. Children under the age of 5 with employed mothers regularly spend an average of 36 hr per week in ECE arrangements (U.S. Census Bureau, 2005). Approximately 42% are in full-time care (at least 35 hr per week), 20% are in care for 15 to 34 hr per week, and 17% are in care for 1 to 14 hr per week. Twenty-two percent spend no time in such care (Capizzano & Main, 2005). In terms of type of care, 32% of children are in center-based arrangements (including both government-funded and private child care centers, Head Start, and preschool programs), 23% are cared for by a relative, 16% are in family child care, and 6% are cared for by a nanny or babysitter (Capizzano, Adams, & Sonenstein, 2000). These percentages vary by family income, with low-income children spending less time than higher income children in formal center-based arrangements and more time in the care of relatives (Capizzano et al., 2000).

This article will focus on three types of formal ECE settings: Child care (including both government-funded and private child care), Head Start/Early Head Start (EHS), and state-funded preschool. *Child care* services are typically funded through federal child care funds (which are usually targeted at low-income families), Temporary Assistance for Needy Families (TANF) funds, or parent fees for service (Greenberg, Ewen, & Matthews, 2006; Kagan & Rigby, 2003). *Head Start* and *EHS* are federally funded comprehensive child development programs that together annually serve more than one million low-income children, birth to age 5, and their families (National Head Start Association, 2007). *State-funded preschool programs* provide early childhood education to 3- and/or 4-year-olds and are largely funded, controlled, and directed at the state level, with some input at the local level (Barnett, Epstein, Friedman, Sansanelli, & Hustedt, 2009). In 2009, 38 states provided state-financed preschool for at least some 3- and 4-year-olds, serving a total of more than 1.2 million children (Barnett et al., 2009). Most states focus their preschool efforts on at-risk children, but six states offer or plan to offer voluntary, universal pre-kindergarten (pre-K) to all 4-year-olds, regardless of family income (Ackerman, Barnett, Hawkinson, Brown, & McGonigle, 2009).

Goals and Purposes of ECE

The variety of ECE programs available to families with young children in the United States reflects a diverse set of goals and purposes. Traditionally, child

care in the United States has been connected to ideas of work and safety (Phillips, McCartney, & Sussman, 2006). Along these lines, the American public generally views child care as a custodial service—a place where children can be kept free from harm so that their mothers can work. This perspective grew out of the longstanding view that childrearing was a private, family matter, and that nonmaternal care should only be used as a last resort. Indeed, the use of publicly provided nonmaternal care in the United States dates back to the mid-19th century, when day nurseries were established to enable low-income mothers to go to work (Cahan, 1989). Later, in response to labor shortages during World War II, federal funds were temporarily used to pay for child care centers so that women could join the workforce (Cohen, 2001). When the war effort ended, however, most of the child care centers were closed. It was not until 1962 that the federal government next earmarked funds for child care, this time in the context of a welfare law.

In contrast to this ambivalence about child care is a distinctly different set of beliefs surrounding the promise that early education holds for low-income children. Whereas child care settings have typically emphasized "care" over "education," the reverse has generally been true of state-funded preschool programs and early intervention programs for low-income children, such as Head Start and EHS. The values that formed the basis for the creation of these programs reflect the belief that high-quality ECE programs can compensate for suboptimal home environments. This belief grew out of new research in the late 1950s and early 1960s that suggested that early environmental deprivation led to suboptimal cognitive development (Zigler & Hall, 2000; Zigler & Muenchow, 1992) and that early enrichment programs could counter these negative effects (Bloom, 1964; Hunt, 1961). Against this backdrop, early intervention came to be seen as a means of permanently enhancing the development of low-income children and possibly even wiping out poverty itself (Zigler & Hall, 2000).

Current Policy Context

The current policy climate surrounding ECE in the United States can be described as supportive but with insufficient resources to back this support. In 2009, the expansion of state-funded preschool programs slowed and states' real per-child spending on preschool decreased for the first time in 2 years (Barnett et al., 2009; Willen, 2010). At the federal level, President Obama has been vocal about his enthusiasm for early education—especially that for low-income children—since before he took office. During his presidential campaign, he pledged to establish a Presidential Early Learning Council that

would coordinate federal, state, and local ECE policies; to quadruple funding for EHS; to provide ECE federal challenge grants to states; and to expand home visiting programs for low-income mothers (Dillon, 2008). Obama also emphasized improving ECE quality in addition to reaching more children. Since taking office in 2009, he did succeed in increasing funding for Head Start and EHS (Guernsey, 2010), but his other plans to expand and improve ECE services have largely taken a backseat to other policy issues.

At the center of the Obama ECE platform was the Early Learning Challenge Fund, which would have provided US$10 billion in competitive grants over 10 years to help states both create and improve the quality of services for at-risk children from birth to age 5, and would have constituted the greatest federal investment in ECE since the creation of the Head Start program in 1965 (Jacobson, 2010; U.S. Department of Education, 2009). In light of the recession and limited federal resources, the Early Learning Challenge Fund was dropped from the federal policy agenda in March, 2010 (Jacobson, 2010). However, in July 2010, the Senate Appropriations Committee proposed a US$300 million investment in the program as part of its fiscal 2011 bill (Ewen, 2010). The Committee also proposed including US$1 billion in new funds for the Child Care and Development Block Grant and an increase of US$990.3 million for Head Start and EHS (Ewen, 2010). Only time will tell if these proposals will come to fruition.

Institutionalized Messages Surrounding ECE

What are the claims made about ECE as a sound investment? Policymakers, business leaders, social scientists, and even law-enforcement agencies argue that ECE programs offer a strong foundation for children's long-term success. The U.S. Department of Education's website on the Early Learning Challenge Fund states that "high-quality [early education] programs are well documented to improve academic achievement, reduce the need for special education, increase employment and earnings, reduce crime and delinquency, and ultimately increase international competitiveness" (U.S. Department of Education, 2009). In recent years, the business community has jumped on the ECE bandwagon, too. The Federal Reserve Bank of Minneapolis has produced several reports on ECE as an economic development initiative. These reports lay out the returns on investment in ECE, arguing that it results in better working public schools, more educated workers, and less crime (Rolnick & Grunewald, 2003, 2007). The Business Roundtable, an association of 150 chief executive officers of leading corporations in the United States, in conjunction with Corporate Voices for Working Families, a coalition of 36 leading

corporations, also has advocated for public investment in high-quality ECE as a necessary component of efforts to improve the American educational system, close the achievement gap, and develop a world-class workforce (The Business Roundtable and Corporate Voices for Working Families, 2003).

Among the social scientists who have touted ECE as a sound investment are well-respected economists such as Nobel laureate James Heckman. Heckman and others argue for investment in ECE programs for low-income children on the grounds that early interventions show much higher returns than later interventions, such as reduced pupil–teacher ratios and public job training programs (Cunha & Heckman, 2007; Heckman, 2006). Interest in ECE has even spread to law enforcement agencies. Fight Crime: Invest in Kids, an anti-crime organization of more than 3,000 police chiefs, sheriffs, prosecutors, other law enforcement leaders, and violence survivors nationwide, supports ECE as a way to fight crime, citing results of two rigorous ECE program evaluations that found that low-income children who participated in the programs were substantially less likely to become chronic lawbreakers or be arrested for a violent crime by the time they reached adulthood, as compared to children who did not participate in the programs (Fight Crime: Invest in Kids New York, 2006). To evaluate claims such as these, a closer examination of the research behind them is needed. Before turning to such an examination, I provide some background on the preschool movement that prompted such widespread interest in ECE as well as a discussion of ECE quality.

Origins of the Contemporary Preschool Movement

Undoubtedly, the biggest development in the field of ECE in the last 20 years has been the rapid proliferation of state-funded preschool programs. Their growth has dramatically changed the ECE landscape, such that nearly 40% of all 4-year-olds now participate in some form of public ECE (Barnett et al., 2009). Three broad influences set the stage for the preschool movement that began in the United States at the end of the 20th century and planted ECE firmly in the American consciousness: The development of the National Education Goals, the rise in maternal employment, and new findings from neuroscientific research. Perhaps the most important of these was the development of the National Education Goals.

In 1989, President George H. Bush convened a meeting of the nation's governors to discuss how to improve America's educational performance and ensure that the nation's workforce would have the knowledge and skills needed to compete in an increasingly global economy (National Education

Goals Panel [NEGP], 1999). The product of this first National Education Summit was a set of six National Education Goals, which were later expanded to eight and codified in the Goals 2000: Educate America Act, signed by President Clinton in 1994 (Zigler, Gilliam, & Jones, 2006). The very first goal stated that "By the year 2000, all children in America will start school ready to learn" (NEGP, 1999, p. vi). Dubbed the "readiness" goal, its first objective was that all children would "have access to high-quality and developmentally appropriate preschool programs that help prepare children for school" (NEGP, 2000, p. 8). Goal 1 brought national attention to the importance of children's readiness for school and prompted discussion and articulation of the definition of "school readiness" (Kagan, Moore, & Bredekamp, 1995).

In addition to the development of the National Education Goals, widespread demographic changes played a role in sparking the preschool movement. The percentage of mothers with children under age 6 who were in the labor force rose steadily from 47% in 1980 to 65% in 2000 (U.S. Department of Labor, 2009), creating a real need for expanded ECE options as a work support. Labor force participation rates among low-income mothers increased particularly dramatically in the latter half of the 1990s, due in part to the passage of the 1996 welfare reform bill (Blank & Schmidt, 2001). Finally, new findings from neuroscientific research highlighted the importance of early life experiences to the development of the brain and later behavior, generating interest in providing enriching experiences to young children, especially those deemed at risk for poor developmental outcomes (Shonkoff & Phillips, 2000; Shore, 1997).

Together, the confluence of these three broad influences—codification of the "readiness" goal, recognition of the growing need for ECE as a work support, and an awareness of the importance of the early years to children's later development—produced a dramatic increase in support for preschool education within a short period of time. Before 1980, only seven states funded preschool programs. By 1991, there were preschool programs in 28 states, and by 2001, 40 states funded preschool programs, most of which served at-risk children (Barnett, Robin, Hustedt, & Schulman, 2003). This proliferation of programs was reflected in an equally remarkable increase in funding: Between 1988 and 1999 alone, estimated state funding for preschool increased from US$200 million to nearly US$2 billion (Clifford et al., 2005).

ECE Quality in the United States

How is the quality of preschool and other ECE programs measured, and what is the quality of ECE programs available to parents with young children today?

ECE quality is typically defined and measured in two ways: In terms of *process* and *structural characteristics*. Process quality refers to the actual experiences that children have in ECE settings with teachers, peers, and materials; structural characteristics include such features as the child–adult ratio, group size, and teachers' formal education, specialized training, and experience (Vandell, 2004; Vandell & Wolfe, 2000). Some measures of process quality include global scores that reflect children's experiences in multiple areas, including interactions with teachers, health and safety provisions, and age-appropriate materials, whereas others focus on specific activities or experiences, such as exposure to academic instruction (Vandell & Wolfe, 2000). State regulations governing the design and structure of ECE programs typically focus on structural characteristics, as they are easier to regulate than process features. For instance, under Oklahoma's universal pre-K program, every lead teacher must have a BA degree and an early childhood teaching certificate, and there is a required child–teacher ratio of 10:1 and maximum group size of 20 (Gormley, Gayer, Phillips, & Dawson, 2005). It is unclear, however, to what extent reliance on these structural features actually guarantees a high-quality program or improved child outcomes (Pianta, 2005).

Studies of children's ECE experiences in the United States have generally found evidence for extensive variation in ECE program quality around a mean that has been described as "mediocre" (National Scientific Council on the Developing Child, 2007; Shonkoff & Phillips, 2000). For example, by extrapolating from results of the NICHD Study of Early Child Care and Youth Development (SECCYD), the most comprehensive study of child care and children's development to date, the NICHD Early Child Care Research Network (ECCRN) concluded that positive caregiving was "highly characteristic" for only 9% of 1- to 3-year-olds in the United States. It was "somewhat characteristic" for 30% of children, "somewhat uncharacteristic" for 53%, and "very uncharacteristic" for 8% (NICHD ECCRN, 2000a). A separate analysis of the quality of pre-K programs in 6 states yielded similar findings. On average, pre-K classroom quality was found to be "minimally acceptable," with most classrooms clustered in the minimal-to-good range (81%) and few in either the good-to-excellent (8%) or inadequate (11%) ranges (Clifford et al., 2005).

Empirical Basis for Institutionalized Messages About ECE

On what grounds are claims about the long-lasting effects of ECE made? Most institutionalized messages about ECE are based on the results of longitudinal

evaluations of three early intervention programs for low-income children begun in the 1960s, 1970s, and 1980s. These are the High/Scope Perry Preschool program, the Carolina Abecedarian Project, and the Chicago Child-Parent Center program. These seminal studies have been championed, in part, because they are among the only studies to employ experimental or quasi-experimental research designs and to follow children through adulthood or young adulthood. As the most influential studies of their kind, they are the focus of my review.

In the High/Scope Perry Preschool study, begun in 1962, a small sample of low-income, African American 3- and 4-year-olds at high risk for school failure were randomly assigned to either a high-quality preschool program or no program (Schweinhart, 2004). The preschool program consisted of daily 2.5-hr classes and weekly 1.5-hr home visits to each mother and child from October through May. Child–staff ratios were kept at or below 6 to 1. Findings from the study indicate that the Perry Preschool program conferred both short- and long-term benefits on its participants in a number of domains. At age 5, children in the program group had a significantly higher mean IQ than those in the no-program group. They outperformed children in the no-program group on school achievement tests at age 14 and had better attitudes about school at age 15. In addition, they were more likely to graduate from high school, had higher annual earnings at age 40, and had fewer lifetime arrests at age 40 than those in the no-program group (Schweinhart, 2004). A cost–benefit analysis estimated that the economic return to society of the Perry Preschool program was US$17 per dollar invested (Schweinhart, 2004). The vast majority of the public return came from crime-related savings (Belfield, Nores, Barnett, & Schweinhart, 2006).

The Carolina Abecedarian Project, begun in 1972, involved random assignment of a high-risk sample of infants to either a preschool treatment group or a control group. Infants assigned to the treatment group received full-day, year-round, systematic educational intervention. Those assigned to the control group were either cared for at home or in some other ECE setting. Families in both the treatment and control groups received supportive social services as needed (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002). Findings indicate that those in the preschool treatment group earned significantly higher scores on intellectual and academic measures through age 21, attained significantly more years of total education, were more likely to attend a 4-year college, and reported lower rates of teen pregnancy and marijuana use than those in the control group. No program effects were found for other types of drug use or for violent or criminal behavior (Campbell et al., 2002).

Results from the quasi-experimental evaluation of the Chicago Child-Parent Center (CPC) program suggest that it, too, has had positive, long-term effects

on the cognitive, academic, and socioemotional functioning of program participants. The CPC program is a large-scale, federally funded center-based preschool and school-based intervention program that provides half-day preschool to low-income 3- and 4-year-olds (Reynolds, Temple, Robertson, & Mann, 2001). Features of the multifaceted program include the following: A structured set of learning activities, child–teacher ratios of 17 to 2, a parent-involvement program, home visitation, and health and nutrition services. Reynolds et al. (2001) compared children who attended the program in the mid-1980s to a matched comparison group of children enrolled in alternative early childhood programs in Chicago. Findings from the 15-year follow-up indicate that children who participated in the preschool intervention for 1 or 2 years had a higher rate of high school completion, more years of completed education, and lower rates of juvenile arrests, violent arrests, and school dropout at age 20 than children in the comparison group (Reynolds et al., 2001).

Findings from the Perry Preschool study, the Abecedarian Project, and the CPC program evaluation suggest that high-quality early education programs can have remarkably long-lasting, positive effects on low-income children's cognitive, academic, and socioemotional functioning. However, there are a number of reasons to be cautious in extrapolating from these results. These include the following: (a) The relevance of the counterfactuals in these studies to present-day discussions of ECE program effects, (b) the generalizability of the results, and (c) differences between the quality of the Perry, Abecedarian, and CPC programs and that of programs available to most low-income children in the United States.

First, demographic changes and changes in the ECE landscape over the past 40 years, including ongoing increases in maternal employment and the growing number of state pre-K programs for low-income children, have rendered the counterfactuals for these studies (perhaps especially those for the Perry Preschool and Abecedarian studies), which consisted largely of children at home with their mothers, increasingly irrelevant. For instance, the employment rate for mothers with children under age 6 rose from 39% in 1975 to 63% in 2005, suggesting that many more children are in some form of nonmaternal care today than was the case in the 1970s (Mosisa & Hipple, 2006). Research suggests that low-income children benefit, both cognitively and in some cases socioemotionally, from participation in nonmaternal ECE, including child care (Votruba-Drzal, Coley, & Chase-Lansdale, 2004), Head Start (U.S. Department of Health and Human Services, 2005), and pre-K (Gormley et al., 2005). Thus, it is likely that if replicated today, the Perry Preschool and Abecedarian studies would yield smaller and/or fewer effects than those reported above, because the control groups would consist primarily of children

with ECE experience instead of those with no ECE experience, as was largely the case in 1962 and 1972.

Second, the generalizability of results of the Perry Preschool, Abecedarian, and CPC studies is questionable for the following reasons: (a) Both Perry and Abecedarian were based on very small samples of children (123 and 111, respectively); (b) the sample of children in each of the three studies was relatively homogeneous, consisting almost entirely of low-income, African American children; (c) findings from these studies may not be generalizable to other locations (e.g., we must be cautious in drawing conclusions about crime effects based on the reductions in crime found in the Perry Preschool study, because there is no way to know if these effects were specific to Ypsilanti, Michigan, where the Perry Preschool was located, or if they would have emerged regardless of where the study took place); and (d) a recent reanalysis of the effects of the Perry Preschool Program and the Abecedarian Project that adjusted for multiple inference found evidence to suggest that significant program effects were, by and large, restricted to female participants (Anderson, 2008). Specifically, treated females showed sharp increases in years of schooling, improved economic outcomes, reductions in criminal behavior and drug use, and increased marriage rates, but there were no significant long-term effects for males.

Third, Perry, Abecedarian, and the CPC—all carefully constructed, high-quality, expensive programs—do not reflect the assortment of scaled-up ECE programs available to most low-income families with young children today. Indeed, these three programs represent the exception rather than the rule. What is needed, therefore, is an understanding of the effects of ECE programs that families *actually* use. The remainder of this article provides such a synthesis.

Developmental Effects of ECE

Child Care

Efforts to understand the effects of child care on children's development have focused on two lines of research: One on the relation between child care quality and children's cognitive and language outcomes and another on the relation between quantity of care and children's socioemotional development, especially problem behavior. In most studies of child care quality and children's development, high-quality care is defined as care in which caregivers provide children with ample verbal and cognitive stimulation, are sensitive and responsive, and give children generous amounts of attention and support (Cost, Quality, & Outcomes Team, 1995; Lamb & Ahnert, 2006; NICHD ECCRN, 1998, 2000b).

These studies suggest that high-quality care is associated with a range of cognitive and language outcomes, even after controlling for family background characteristics such as social class (e.g., Cost, Quality, & Outcomes Team, 1995). In the NICHD Study of Early Child Care, quality of care was consistently but modestly related to better cognitive (e.g., memory, problem-solving, letter identification, number/counting) and language outcomes at 15, 24, 36, and 54 months, even after controlling for multiple child and family characteristics (NICHD ECCRN, 2000b, 2002; NICHD ECCRN & Duncan, 2003). There is also evidence that child care quality has modest long-term effects on children's language ability, math ability, memory, and attention skills through kindergarten, and in some cases through the later elementary and middle-school grades (Belsky et al., 2007; NICHD ECCRN, 2005b; Peisner-Feinberg et al., 2001; Vandell et al., 2010). Stronger positive effects of child care quality have sometimes been found for children from more at-risk backgrounds (Peisner-Feinberg et al., 2001).

The literature on child care use and children's socioemotional development is characterized by two conflicting stories. On one hand, a large body of research suggests that child care is detrimental to children's social development. On the other hand, there is growing evidence that child care programs can benefit children's socioemotional competence, especially when program quality is high and especially among children from low-income families. The first, "negative" pattern of findings has been borne out most consistently in results of the NICHD SECCYD. Results from this and other studies indicate that the more hours children spend in nonmaternal care, the more behavior problems and conflict with adults they show at age 2, age 4.5, in kindergarten, and in both elementary and middle school (Belsky et al., 2007; Côté, Borge, Geoffroy, Rutter, & Tremblay, 2008; Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007; NICHD ECCRN, 1998, 2002, 2003, 2005a; Vandell & Corasaniti, 1990; Vandell et al., 2010). In most cases, the effects remain even after controlling for child care quality. However, there is emerging evidence from the NICHD study that quality may moderate the effect of hours in care on children's externalizing behavior, such that child care hours are more strongly related to externalizing behavior when children are in low- versus high-quality care (McCartney et al., 2010).

Recent work using the NICHD sample has also identified a specific link between the number of hours spent in center-based care during the first 4.5 years of life and children's teacher-reported behavior problems through sixth grade (Belsky et al., 2007), suggesting that time spent with large groups of peers may be the mechanism linking child care to children's socioemotional development. Although these effects were powerful enough to extend through

middle childhood, they were not replicated at age 15 (Vandell et al., 2010). Children from low-income families show a somewhat different pattern of findings, such that no negative behavioral effects of center-based care are found when quality of care is controlled (Loeb, Fuller, Kagan, & Carrol, 2004; Votruba-Drzal et al., 2004), and spending more hours in nonmaternal care actually leads to decreases in behavior problems when quality is high (Votruba-Drzal et al., 2004).

Head Start and EHS

Since its creation, Head Start has been the subject of hundreds of studies. These have generally found that the program has small, short-term positive effects on children's cognitive and social development (e.g., Lee, Brooks-Gunn, Schnur, & Liaw, 1990; Love, Tarullo, Raikes, Chazan-Cohen, 2006; Zill et al., 2003). Only in recent years have social scientists been able to design studies of Head Start and EHS that can more credibly identify the programs' causal impacts. Results of the randomized experimental Head Start Impact Study suggest that the program benefits low-income children's cognitive and social development in the short term, but has few longer term effects. Effects on cognitive development at the end of the program year included improved vocabulary, letter-word identification, pre-academic skills, and parent-reported emergent literacy (U.S. Department of Health and Human Services, 2005). Somewhat stronger impacts were found for children who entered the program as 3-year-olds (vs. as 4-year-olds). Program participation was also related to reductions in parent-reported overall problem behaviors and hyperactivity for 3-year-olds, but not 4-year-olds. Significant effects were quite modest in size, but were consistent with other evidence on high-quality programs. By the end of first grade, however, few significant impacts remained. Children who participated in the program as 4-year-olds displayed significantly higher vocabulary scores than those in the control group, and those who participated as 3-year-olds performed better on a standardized test of oral comprehension (U.S. Department of Health and Human Services, 2010). With regard to socioemotional outcomes, there was some evidence that the 3-year-old cohort had closer and more positive relationships with their parents, but findings for 4-year-olds were inconsistent.

A number of explanations have been offered for these minimal long-term effects (National Forum on Early Childhood Policy and Programs, 2010). First, it appears that children in the control group caught up to their peers in the Head Start treatment group during the first 2 years of school, suggesting that children's school experiences might have contributed to the absence of

program impacts at the end of first grade. Second, the ECE experiences of children in the treatment and control groups were much more similar than the treatment and control conditions in most randomized experiments. About half of 4-year-olds and 40% of 3-year-olds in the control group were enrolled in center-based ECE programs soon after the study began. Furthermore, a year later, some of the 3-year-olds in the control group enrolled in Head Start, which they were free to do after the initial program year. The more similar the experiences of children in the treatment and control groups, the less likely the two groups are to differ in their outcomes. Finally, the quality of Head Start programs in the study was variable, such that fewer than 5% of 4-year-olds were in programs that received an "excellent" quality rating. More work is needed to identify the features of Head Start programs and classrooms that are related to children's positive developmental outcomes.

Findings from the equally rigorous, randomized experimental EHS Impact Study suggest that the program has both short and longer term effects on low-income children's development. In the short term, EHS children performed better on measures of cognition, language, and socioemotional functioning at age 3 than did children in the control group (Administration for Children and Families, 2006). Longer term results from the age-5 follow-up reveal that children who participated in formal ECE programs (i.e., center-based child care, Head Start, or pre-K) after age 3 showed better early reading-related skills, but also increased levels of parent-reported aggressive behavior. However, those who attended EHS as infants and toddlers before entering formal care displayed significantly lower levels of aggression than did those who did not attend EHS (Administration for Children and Families, 2006). In short, children who experienced both EHS and formal ECE programs after age 3 received the benefits of EHS and the improved reading-related skills associated with formal ECE programs without the increase in aggressive behavior. Taken together, the research on Head Start and EHS suggests that earlier enrollment in and/or greater exposure to these programs across the early childhood years reaps greater benefits.

Preschool and State-Funded Pre-K

A small but growing body of research has focused on the effects of participation in state-funded pre-K programs on children's developmental outcomes and has found a mixture of positive and negative effects. Most of these studies use advanced statistical methods to address the problem of selection bias. Gormley et al. (2005) examined the effects of participation in Tulsa, Oklahoma's high-quality universal pre-K program on children's cognitive development

by comparing kindergarten children who had just completed pre-K to children of the same age who were just beginning pre-K because they had missed the birthday cutoff date the year before. Program effects on standardized tests of early literacy and premath skills were large and exceeded those reported for other state-funded pre-K and high-quality child care programs. The program benefited children from all racial/ethnic groups and diverse income brackets. Gormley and colleagues have also reported positive impacts of pre-K participation on children's socioemotional development in the form of reduced timidity and enhanced attentiveness in the classroom (Gormley, Phillips, Newmark, Perper, & Adelstein, in press.) In a separate analysis focused exclusively on low-income children, Lowenstein, Phillips, and Gormley (2009) also found that participation in pre-K was associated with lower levels of timidity and higher levels of attentiveness at kindergarten entry.

Using a sample of five state-funded pre-K programs, more than 5,000 children, and the same methodological approach used by Gormley et al. (2005), Barnett, Jung, Wong, Cook, and Lamy (2007) estimated the effects of pre-K participation on children's learning at kindergarten entry. They found evidence of positive effects on language, literacy, and math skills. Effects on print awareness were particularly large, followed by gains in math and language skills. They also found evidence of state-level variation in program effects.

Results of analyses of a nationally representative data set, the Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (Magnuson, Ruhm, & Waldfogel, 2007), indicate that participation in both pre-K and other types of center-based care ("preschool"), as defined by parents, was associated with better reading and math skills at school entry, but also increased aggression and decreased self-control. By the spring of first grade, effects on academic skills had largely disappeared, but the negative behavioral effects persisted. As in the child care literature, larger and longer lasting academic gains were found for economically disadvantaged children. Magnuson et al. (2007) also found that there were no negative socioemotional effects among public school children whose pre-K and kindergarten classrooms were located in the same school, a finding that suggests that pre-K programs located in the public schools may generate the greatest return on public investment in early education.

Conclusions and Policy Implications

The purpose of this article was to look at institutional messages about the effectiveness of ECE programs and the empirical evidence that bears on these messages. As supporters of high-quality ECE, politicians, business leaders,

social scientists, and law enforcement agencies claim that participation in ECE programs leads to improved school performance, higher rates of high-school graduation and employment, increased earnings, reduced crime and delinquency, and increased international competitiveness. A close examination of research on the developmental effects of ECE, however, suggests that there is a gap between what the research says and what the public believes about ECE's effectiveness.

Most institutional messages about ECE rely on results of a small set of studies that have become well-known because they found dramatic long-term effects of participation in early intervention programs for low-income children. Although the results of these studies—the Perry Preschool study, the Abecedarian Project, and evaluations of the Chicago Child-Parent Centers—are encouraging, they are outdated, based on small (in some cases), homogeneous samples, and/or do not reflect the array of scaled-up ECE programs available to most children in the United States. Instead of reflecting the quality and variation found in today's ECE landscape, these studies demonstrate the *potential* that ECE holds to make a difference in the lives of low-income children under tightly controlled conditions.

A review of the literature on the developmental effects of child care, Head Start/EHS, and state-funded preschool suggests that ECE programs can and do have positive effects on children from both low- and higher income families, but that these effects typically fade over time. The following conclusions can be drawn from the research reviewed here: (a) Participation in child care, Head Start/EHS, and state-funded preschool programs benefits children's cognitive development and academic achievement in the short term (i.e., 1-2 years after entering the program) and, in some cases, the longer term (e.g., through elementary or middle school); (b) stronger positive effects on cognitive and academic outcomes are typically found for children from economically disadvantaged backgrounds; (c) effects on children's socioemotional development are mixed, with studies of child care reporting negative behavioral effects of long hours in care in both the short and long term, studies of Head Start/EHS reporting positive short-term effects, and studies of preschool reporting a combination of positive and negative effects; and (d) in contrast to their higher income peers, children from low-income families are more likely to benefit socioemotionally from exposure to ECE.

In light of these conclusions, it is somewhat misleading to make claims about the ability of ECE programs to benefit society in the form of increased high-school graduation and employment rates, reduced crime and delinquency, increased earnings, and increased international competitiveness. Indeed, the purpose of Head Start and most state-funded preschool programs is to level

the playing field so that low-income children arrive at school on equal footing with their higher income peers (Zigler, 2003). This was also the purpose of the first National Education Goal (NEGP, 1999). Some would argue that to expect anything more than *school readiness* from ECE programs is unrealistic (Brooks-Gunn, 2003). For one thing, the quality of the school environment to which a child is exposed subsequent to being in ECE is a factor in the maintenance of gains made during the ECE year. In a study of the longer term effects of Head Start participation, Currie and Thomas (2000) found that the children most likely to experience "fade-out" in test score gains were also most likely to attend the worst-quality schools. This finding suggests that gains made during the ECE year can be maintained as long as subsequent schooling is not of poor quality. In short, a fair and balanced reading of the ECE literature would recognize that ECE is not a silver bullet and that it is necessary to consider children's school experiences when evaluating their long-term trajectories.

In terms of policy and practice, efforts to improve the success of all children and the life chances of low-income children in particular cannot stop when they arrive at school. Ongoing supports (including parent-involvement programs, health and nutrition services, and services to support children's transition from preschool to school) must be provided (Zigler, 2003). In terms of research, developmental and education scientists should focus their efforts on trying to understand the conditions under which ECE programs and schools are maximally (and synergistically) effective in fostering children's development and giving low-income children a leg up.

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Bio

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