

Early Childhood Education: A Caveat

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Executive Summary

Last year, Arizona governor Janet Napolitano released a School Readiness Action Plan that included the widely discussed proposal for state-funded kindergarten and a lesser-discussed plan for “state-supported preschool.”¹ Speaking before the National Task Force on Public Education, the governor said her aim was “ensconcing early care and education as a lockstep component of public schooling.”² She considers the plan a “starting point” for the state’s role in the “development of Arizona’s youngest children.”³

The current administration argues that early schooling improves academic achievement. The state superintendent of public instruction, Tom Horne, writes, “Studies show that a dollar spent on academically oriented all-day kindergarten can equal more than \$7 or \$8 spent in later grades in producing the same academic progress.”⁴ The governor says full-day kindergarten “contributes to lower dropout rates.”⁵

To help determine the efficacy of early education programs, we examine the results of programs considered to be early education models, including Perry Preschool, Abecedarian, and Head Start, and Arizona-based programs including Reading First and kindergarten in the Alhambra and Chino districts. We also review national data from the National Center for Education Statistics, which finds no lasting reading, math, or science achievement differences between children who attend half-day and full-day kindergarten. We find the widespread adoption of preschool and full-day kindergarten is unlikely to improve student achievement.

America’s flexible approach to early education gives children a strong foundation. Skills assessment at kindergarten entry and reports by kindergarten teachers show a large and increasing majority of preschoolers are prepared for kindergarten. The effectiveness of the current system is also evident in early test scores. At age ten, U.S. children have higher reading, math, and science scores than their European peers who attend the government preschools cited by advocates as models for the United States. To the degree that the state remains involved in financing early education, we recommend measures for transparency, program assessment, and improved flexibility through individual student funding.

Introduction

Arizona's move toward more government preschool and kindergarten programs is not unprecedented. In France, Italy, and the United Kingdom, there is nearly universal enrollment of three- and four-year-olds in center-based institutions.⁶ A few states across the country have adopted similar systems. Georgia created the first statewide universal preschool program for four year-olds in 1993, and Oklahoma, New York, and West Virginia have moved in a similar direction. In 2002, Florida voters adopted a constitutional amendment requiring the state to provide free preschool for every four-year-old child.⁷

Conservative estimates show that Arizona currently spends more than \$410 million annually on various day care and early education programs, including Head Start, preschool, and kindergarten.⁸ This estimate does not include funds for tribal and migrant worker programs or multiple funding streams used by school districts to fund all-day kindergarten. As policymakers consider early education proposals, we have the opportunity to examine research on preschool and kindergarten, review experience and findings from domestic programs, and look to international data.

We find strong evidence that the widespread adoption of preschool and full-day kindergarten is unlikely to improve student achievement. For nearly fifty years, local, state, and federal governments and diverse private sources have spent billions of dollars funding early education programs. Some early interventions have had meaningful short-term effects on disadvantaged students' grade-level retention and special education placement. However, the effects of early interventions routinely disappear after children leave the programs.⁹ The phenomenon known as "fade out" is important because it means that early schooling may be immaterial to a child's later school performance, or that the current school system as structured is unable to sustain those early gains.

For mainstream children, there is little evidence to support the contention that formal preschool and kindergarten are necessary for school achievement or more advantageous than learning in a traditional setting, and there is some evidence that day care and preschool can be detrimental.

From 1965 to the present day, the United States has undergone a sea change in formal early education. Preschool and kindergarten, which were rarely used, are now the norm. Despite increased enrollment in formal early education programs, student achievement has shown little to no improvement. To the degree that international test data are instructive, America's decentralized early education system is outperforming the European model and excels in equipping students for superior achievement in the elementary years.

Implicit in Governor Napolitano's plan is the presumption that the state should take more responsibility for educating young children. A large majority of "child advocates" envision something similar, with almost seven of ten saying government policy should move toward a universal, national system similar to those of many European countries.

Most parents feel otherwise. More than 70 percent of parents with young children say it is their responsibility to pay the costs of caring for their children, and only one in four would move toward a universal system paid for by the government. Also a majority of low-income parents (those earning no more than \$25,000 per year) believes that bearing the cost is their responsibility and not society's. The public opinion research organization, Public Agenda, reports, "At the most basic level, parents of young children believe that having a full-time parental presence at home is what's best for very young children, and it is what most would prefer for their own family."¹⁰

The governor attempts to address parents' concerns by saying participation in the programs will be voluntary. Yet it is difficult to square that rhetoric with a plan intended to make early education "a lockstep component of public schooling." Today, all fifty states have compulsory attendance laws, applying generally to children between the ages of five and eighteen, and many policymakers have been forthright in calling for extending compulsory education to preschoolers.

For example, in 2001, District of Columbia councilman Kevin Chavous proposed the "Compulsory School Attendance Amendment Act" to make school compulsory for every preschoolaged child in the nation's capital.¹¹ The Hon. Zell Miller, former U.S. senator and Georgia governor, has also expressed a preference for mandatory enrollment, saying, "If I had a choice of pre-K or 12th grade being mandatory, I'd take pre-K in a second."¹² For many people who are convinced that preschool is a necessity, mandatory attendance becomes the next logical step. As one prominent Vermont legislator explained when he proposed a study on the cost of compulsory preschool for three- and four-year-olds, compulsion is the only way to guarantee that children have an equal opportunity for education.¹³

Fundamentally, the preschool and kindergarten debate is not about the effectiveness or expense of the programs. At heart is the question of in whose hands the responsibility for young children should rest. On that question, plans to entrench the state further into early education cannot be squared with a free society that cherishes the primacy of the family over the state.

What Do We Know? Understanding the Research

Policymakers are interested in early education for several reasons. Some proponents see preschool and kindergarten as a politically palatable way to subsidize day care.¹⁴ The primary argument made by Arizona policymakers, including Gov. Janet Napolitano, state superintendent of public instruction Tom Horne, and the State School Readiness Board, is that more early learning will provide the experiences and environment necessary to promote the healthy development of children, leading to subsequent school achievement. For example,

- State superintendent of public instruction Tom Horne writes, “Studies show that a dollar spent on academically oriented all-day kindergarten can equal more than \$7 or \$8 spent in later grades in producing the same academic progress.”¹⁵
- Gov. Janet Napolitano writes, “Extensive research shows that full-day kindergarten improves students’ reading, writing and math skills, and it contributes to lower dropout rates.”¹⁶
- The State School Readiness Board writes, “Full-day kindergarten can lower grade retention, improve language and math skills, lead to higher achievement test scores in eighth grade, and improve attendance and social skills.”¹⁷

Unfortunately, most of the research informing those statements is limited in its applicability to mainstream students and plagued by methodological shortcomings, including small sample size, high attrition rates, infrequent random selection, and infrequent use of comparison groups. Some of the research has been wholly discredited.

For instance, Superintendent Horne suggests that \$1 invested in full-day kindergarten can save \$7 in later years. Although he does not specify, this figure appears to be based on a flawed cost-benefit analysis from one study of 123 children conducted from 1962-1965, which independent peer reviewers found to be compromised by significant sampling and methodological errors. It also lacks the ability to inform the preschool discussion for mainstream children because it included only children at risk of “retarded intellectual functioning.”¹⁸ Further undermining confidence in the results is the fact that its findings have never been replicated. These findings are discussed in detail under the section titled “Perry Preschool.”

Taken as a whole, a review of the research shows that some early interventions have had meaningful short-term effects on disadvantaged students’ cognitive ability, grade-level retention, and special education placement. However, most research also indicates that the effects of early interventions disappear after children leave the programs.¹⁹

This finding helps explain why two researchers can look at the same study and reach different conclusions: the National Center for Education Statistics (NCES) studies, for instance, which have received significant press coverage and are discussed later in detail, show a slight advantage for full-day kindergartners over half-day kindergartners as measured at the end of the kindergarten year. Critically, however, they show no differences in academic achievement between the two groups by the end of third grade. (See “Full-day or Half-day? The Kindergarten Decision.”)

The phenomenon known as “fade out” is important to discussions of preschool and kindergarten because it means that early schooling may not measurably affect a child’s later academic performance. However, if fade out occurs, not because programs are ineffective, but because the schools children later attend are unable to maintain those gains, then it is reasonable to conclude that preschool and kindergarten will not result in

lasting gains unless or until elementary and secondary schools are significantly improved. Either conclusion points invariably to the need for reform within the current school system.

As will be discussed later, the few instances in which research has shown the potential of early intervention for improving children's long term outcomes, the research has been conducted on severely disadvantaged children only in intense settings involving a level of intervention far different from either preschool or kindergarten. For instance, in the widely cited Abecedarian program, children were placed in the program as infants, at the average age of just over four months old.

Importantly, most research has concentrated on children considered to be at risk of school failure, and that research does not inform questions about the majority of mainstream students. The studies that have been conducted on mainstream children generally do not show benefits from early education programs. According to David Weikart, past president of the High/Scope Educational Research Foundation responsible for Perry Preschool: "For middle-class youngsters with a good economic basis, most programs are not able to show much in the way of difference."²⁰

A significant body of research shows that formal early education can be detrimental to mainstream children. David Elkind, professor of child development at Tufts University and author of numerous books on cognitive and social development in children and adolescents, explains,

The image of child competence introduced in the 1960s was intended to remedy some of the social inequalities visited upon low-income children. But the publicity given the arguments of child competence was read and heard by educators and middleclass parents as well. . . For this reason it was uncritically appropriated for middle-class children by parents and educators. While the image of childhood competence has served a useful function for low-income children and children with special needs, it has become the rationale for the miseducation of middle-class children. . .²¹

Elkind explains that children who receive academic instruction too early—generally before age six or seven—are often put at risk for no apparent gain. By attempting to teach the wrong things at the wrong time, early instruction can permanently damage a child's self esteem, reduce a child's natural eagerness to learn, and block a child's natural gifts and talents. He concludes,

There is no evidence that such early instruction has lasting benefits, and considerable evidence that it can do lasting harm. . . If we do not wake up to the potential danger of these harmful practices, we may do serious damage to a large segment of the next generation. . .²²

The notable absence of benefits for mainstream children coupled with evidence that early education programs can be detrimental to their development should be of critical concern

in light of the fact that policymakers seek preschool and full-day kindergarten for *all* children, not just the small percentage classified as being at risk for school failure.²³

Ready or Not? An Overview of America's Preschoolers

Discussions of preschool are premised partly on the notion that many children are inadequately prepared for entry into kindergarten. For instance, the federal initiative *Goals 2000* established “readiness” as the nation’s first education goal, stating, “By the year 2000, all children in America will start school ready to learn.”²⁴ Yet there is little agreement in child development literature, among program proponents, or among parents about what children should know and what skills they should possess or by what age, which makes defining “readiness” highly subjective.²⁵

Here we address the question of whether children are “ready” for kindergarten by examining: (1) widely used proxy measures for assessing readiness; (2) concrete skills assessment at kindergarten entry; and (3) how kindergartners perform on measures that kindergarten teachers say are the most important for kindergarten preparedness. On these measures, data indicate that most children entering kindergarten are equipped with the knowledge and traits required to enter kindergarten.

In the *Goals 2000* literature and elsewhere, researchers use preschool participation rates and the frequency with which parents read to their children as two important indicators of readiness.²⁶ By those measures, a high and increasing percentage of American preschoolers are ready for kindergarten. Data show only five percent of three year-olds attended preschool in 1965; today, 39 percent attend. Sixteen percent of four-year-olds attended preschool in 1965; today, that figure is 66 percent.²⁷

Data also show families engage their children in literacy activities regularly and with increasing frequency. As measured from 1993 to 1999, the percentage of preschoolers who are read to three or more times per week has increased from 78 percent to 81 percent. The percentage of preschoolers who are taught letters, words, or numbers with equal frequency has increased from 58 percent to 64 percent. The upward trend is also present in the increasing percentage of preschoolers who are taught songs or music, and have done arts and crafts with a family member.²⁸

Therefore, according to the two common proxy measures of readiness— preschool enrollment rates and early literacy activities—a majority and increasing number of preschoolers are prepared for kindergarten entry. Although there may be room for improvement, the proxy data indicate that the problem of under-preparedness is narrow and diminishing.

We find no studies that have examined specifically the preparation levels of Arizona preschoolers prior to kindergarten entry. The same dearth of information existed on the

national level until 1998 when the National Center for Education Statistics (NCES) began conducting the Early Childhood Longitudinal Study (ECLS-K), which assessed 22,000 children at kindergarten entry and most recently reported on those students through the third grade. The study is the only one of its kind, using a nationally representative sample of children, and conducting a longitudinal and multivariate analysis that is a requirement for assessing the long-term benefits of early education and kindergarten programs.

Researchers Nicholas Zill and Jerry West explain,

Until recently, we have lacked systematic information about what children know and can do at school entry. The data that have been available depended on reports about children's skills from the parents of preschool children, rather than on direct assessments of the children themselves. With the launching of the U.S. Department of Education's Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K) in the fall of 1998, however, measures of the knowledge, skill, health, and behavior of a large and nationally representative sample of American kindergartners are available.²⁹

The NCES assessment allows researchers to move beyond proxies into specific, verifiable skills. According to the first national assessment of the skills and traits children possess as they enter kindergarten, "America's Kindergartners," U.S. kindergartners have a strong foundation. In terms of concrete literacy development, 82 percent of children entering kindergarten have basic familiarity with print skills such as knowing that print reads left to right.³⁰ In terms of concrete mathematics knowledge, 94 percent of children entering kindergarten pass mathematics proficiency level one, that is, reading numerals, recognizing shapes, and counting to ten.³¹

Finally, we review the factors that public school kindergarten teachers say are "very important" or "essential" to kindergarten readiness—physical health and eagerness to approach new activities.³² Children's health is reported as very good or excellent, with just three percent of children having "fair or poor general health." At the same time, 92 percent of children are "eager to learn."³³ Interestingly, only 10 percent of kindergarten teachers say knowing the letters of the alphabet is very important or essential to being ready for kindergarten, and just 8 percent consider being able to count as very important or essential.³⁴

According to the proxy measures of preschool enrollment rates and early literacy activities, concrete skills assessment at kindergarten entry, and measures ranked by kindergarten teachers as important or essential to preparing children for kindergarten, most children entering kindergarten are equipped with the knowledge and traits required to begin the kindergarten year. The high levels of preparedness call into question the notion that there is a widespread need for yet more government involvement in this arena.

Full-day or Half-day? The Kindergarten Decision

In Arizona today, an estimated 56 percent of kindergartners attend half day programs, and 44 percent attend full-time.³⁵ Currently, kindergarten is funded through diverse sources including the state general fund, local taxes, and parent fees. Governor Napolitano has proposed a centralized, statewide full-day kindergarten program with a projected price of \$200 million annually, not including current spending on kindergarten or an additional \$100 million required to build new classrooms.³⁶

Will full-day kindergarten improve student achievement?

Local advocates point to the Alhambra and Chino school districts and the Reading First program as evidence that full-day kindergarten is worthwhile. Testifying about her views of full-day kindergarten, the governor said, “The Alhambra school district has long been a model for full-day kindergarten success.” The governor continued by citing a performance analysis conducted by the Chino Valley Unified School District, stating, “We know what works, we’re just not doing it.”³⁷ Jim Rice, Alhambra superintendent, believes the preschool programs are working, citing superior test scores for students attending the district’s preschool programs. “This is the type of information to get out to our legislature,” Rice reportedly said. “This is working.”³⁸

We examine summaries of those three programs and find their research designs of poor quality, rendering them of little help in addressing the question of whether full-day kindergarten is beneficial to students.

Campbell and Stanley’s classic 1963 work, *Experimental and Quasi-Experimental Designs for Research*, has served as a basic text for social science researchers for generations, laying out a variety of research designs and what the authors describe as “threats to validity.”³⁹ Focusing on education research, they explain eight internal threats to validity (in which a researcher mistakenly attributes changes in an experimental group to the treatment), and four threats to external validity (whereby the researcher cannot generalize the results of the experiment to broader populations).

Only the highest form of experimental design, involving random assignment and a control group, can hope to remove all twelve threats to validity. Through this technique, students are randomly assigned to experimental and control groups, and if conducted properly, this technique creates two groups that are nearly identical (within a measurable amount of random error)—making the introduction of the treatment the crucial and measurable difference between the two groups. Conversely, on the opposite end of sophistication, is a design known as “Static Group Comparison.” The Alhambra and Chino summaries follow this design. Unfortunately, this design controls for just four threats to validity, making it one of the least valid and informative designs. The Reading First design is stronger, lacking only randomization, as explained below.

Alhambra

The Alhambra summary compares the scores of third-grade and fifth-grade students who attended *both preschool and full-day kindergarten* to the scores of all third-grade and fifth grade students in the district, and reports that scores are higher for children who attended preschool and full-day kindergarten.⁴⁰ The district concludes, “Students who attend a preschool program and full-day kindergarten are better prepared and have a much greater chance of succeeding in school.”⁴¹ However, it is unclear whether preschool and kindergarten attendance are responsible for the difference in test scores.

Alhambra’s critical flaw is that the researchers did not test children before they entered the programs, which means the differences between the two groups may have been present *before the children entered school*. If for any reason—whether systematic or by random chance—those few students began the program with higher scores than average, the study is without scientific value. For instance, if the parents who placed their children in both preschool and all-day kindergarten did so because they value education more highly than the average family, this could lead to mistakenly attributing the higher scores of the treatment group to the program, when in fact the higher scores could be either partially or wholly the result of family background or other student characteristics. Given the body of research showing the primacy of family background and influence as the strongest educational determinant, this oversight is critical.⁴² Without a pre-test or random assignment, we simply cannot know whether the test score differences are a result of the programs, family differences, self-selection bias, or other circumstances entirely.

Even if the findings are reflective of the Alhambra district, which cannot be discerned from the data the district provided, the research design the district chose does not address external validity—meaning that we can have no confidence that their results, even if accurate, can be generalized to Arizona. To obtain this information, the researchers would have to measure various characteristics of the student population, which was not done. The combined lack of pre-test information, random assignment, and small sample sizes render the report of little value. Moreover, the Alhambra summary is silent on the question of whether full-day kindergarten is more valuable than half-day kindergarten since its treatment was preschool with full-day kindergarten: it simply did not control or test for this information.

Chino

Chino compares the test scores of kindergarten students in one elementary school who had enrolled in full-day kindergarten to the scores of students who had enrolled in a half-day program. It finds higher test scores for children in the full-day program. It is unclear from the summary how many children were tested each year, but the report states, “In the 2003 school year, out of 102 students in Del Rio’s kindergarten, parents of only twelve students chose a part-time program.”⁴³ We assume the number of participating students was similar in the years tested. The Chino summary suffers from the same flaws in the Alhambra report—no pre-test was conducted to assess the children’s starting points,

assignment to the programs was not random, and the sample size was extremely susceptible to threats to validity. Lacking a pre-test, we simply cannot know whether the test score differences existed prior to school entry. Lacking random assignment, we cannot determine whether the test score differences are due to other factors, such as the educational values or background of the families choosing one program over the other. Additionally, with an assumed sample size of one dozen students, we can have no confidence that the results are anything but random. In addition, children were not monitored past kindergarten. The Chino data are uninformative.

Reading First

The Reading First analysis has a stronger design than the Alhambra and Chino summaries, yet it, too, suffers from important shortcomings. The report examines the test scores of children in full-day and half-day kindergarten programs at school entry and at the end of the kindergarten year, and finds that 59.8 percent of the full-day kindergarteners met the “benchmark,” compared to 42.6 percent of the half-day kindergarten group, a reported advantage of 17 percent.⁴⁴ It finds the full-day group made more progress in reading than did the students in half-day classes.⁴⁵

Like the Alhambra and Chino summaries, the Reading First analysis is susceptible to selection bias, which means researchers cannot determine with any certainty whether the test score differences are the result of the kindergarten programs or whether the results may be due to other factors such as the educational values of the families choosing one program over the other. Equally problematic is the absence of controls on the background of the students. There is no multivariate analysis, which would measure and control for a number of factors about each group. For example, one might measure the family income of every child and the highest level of educational attainment of each child’s mother, and then run an analysis with each factor included as a separate control variable. If, for example, the all-day kindergarten group had significantly higher family incomes than the half-day group, it could lead to the impression that the all-day program led to score gains when in fact it was a difference in family background that led to the appearance of an experimental effect. Randomization minimizes these types of differences, and measuring and controlling for them in a multivariate analysis could nearly eliminate them. The Reading First analysis does neither. Moreover, the researchers did not measure whether the differences observed were statistically significant (i.e., not likely to be the result of chance). Therefore it is a heroic assumption to argue that all differences observed are due to the kindergarten programs.

Nonetheless, the size of the difference at the end of the kindergarten year is such that the data might withstand the introduction of the proper controls and could be found to be significant. This would be consistent with research showing that full-day kindergarten gives children a modest short-term academic advantage over children in half-day programs.⁴⁶

We note, however, that the differences researchers observed in the Reading First analysis already began to fade by the beginning of first grade. At the end of kindergarten, 17

percent more of the full-day students had attained the benchmark than those in the half-day program (59.8 percent compared to 42.6 percent). As the Reading First analysis reported, just a few months later, at the beginning of first-grade, that advantage dropped almost in half, to 10 percent (58.7 percent compared to 49 percent). Similarly, at the end of kindergarten, 15 percent more of the half-day students were recommended for intensive support (34.7 percent compared to 19.9 percent), but by the beginning of first grade, the difference had dropped to 10 percent (23.6 percent compared to 13.6 percent).

Therefore, the reasonable conclusion to draw from the Reading First analysis is that, while we cannot be confident in the advantages of full-day kindergarten, we can be sure that, if those advantages exist, they also fade quickly. This finding would be consistent with the highest quality research conducted to date on kindergarten programs.

This is why the National Center for Education Statistics Early Childhood Longitudinal (ECLS-K) study is so important. As noted earlier, the researchers assessed 22,000 children at kindergarten entry and most recently reported on those students through the third grade. The data set is the only one of its kind, giving researchers information on dozens of variables that impact student achievement, and, importantly, allowing them to control for the impact of kindergarten programs.

The ECLS-K research shows the same pattern documented by hundreds of early education studies: children in full day kindergarten are afforded a modest academic edge over children in half-day kindergarten when measured at the end of the kindergarten year. However, that initial edge completely disappears by third grade.

At the end of the kindergarten year, the researchers find there is “little meaningful difference” on reading and math test scores between all-day and part-day kindergartners. They write, “In terms of kindergarten program type (i.e., all day or part day), there is little meaningful difference in the level of children’s end-of-year reading and mathematics knowledge.”⁴⁷ What is the difference? “On a reading scale that ranged from 0 to 72, the average kindergartner in a full-day program gained 10.6 points over the school year. For children in half-day kindergarten programs, the average gain was 9.4 points.”⁴⁸ Final reading scores were 32.1 and 31.3, respectively. The findings in mathematics are parallel.⁴⁹

The difference is modest, and all the more modest considering full-day students spend twice as much time in school as their half-day peers.

Importantly, the “little meaningful difference” observed at the end of the kindergarten year no longer exists by third grade. By the end of third grade, the researchers no longer detect a difference between students who attended part-day or full-day programs. They write, “This report did not detect any substantive differences in children’s third-grade achievement relative to the type of kindergarten program (full-day vs. half-day) they attended.”⁵⁰ The finding holds across all subject matters tested. “Third-grade reading, mathematics, and science achievement did not differ substantively by children’s sex or kindergarten program type.”⁵¹

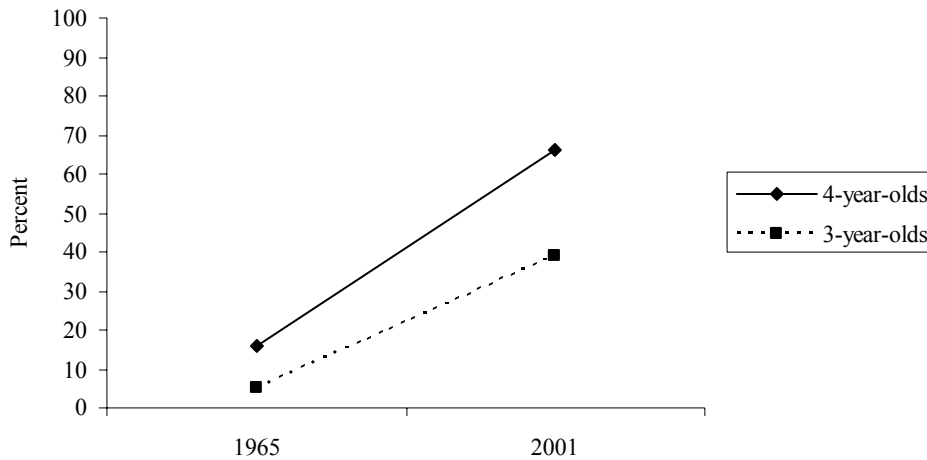
The NCES reports document on a large scale the piecemeal findings on early education that have been trickling in for years: in the short-term, more early education may confer more gains than lesser amounts of early education, but over time, those advantages are not sustained. Unless or until the elementary and secondary school system is improved, it is unlikely that preschool or kindergarten will lead to a measurable improvement in school achievement.

What Impact Do Preschool and Kindergarten Have on Achievement? A Historical Overview

The NCES findings may be less surprising in historical context. From 1965 to the present day, the United States has undergone a sea change in formal early education. Preschool, then uncommon, is now the mode.

As Figure 1 shows, only five percent of three-year-olds attended preschool in 1965; today, 39 percent attend. Sixteen percent of four-year-olds attended preschool in 1965; today, that figure is 66 percent. For five-year-olds, kindergarten has become almost universal.⁵²

Figure 1: Percentage of Three- and Four-year-olds Enrolled in Preprimary Programs, 1965-2001



Source: National Center for Education Statistics, Digest of Education Statistics, 2003, Table 43, available at nces.ed.gov/programs/digest/d03/tables/dt043.asp.

Despite the widespread use of formal early education programs, student achievement has shown little to no improvement. For instance, Figure 2 shows fourth-grade reading, science, and math scores on the National Assessment of Educational Progress (NAEP) have been little better than stagnant since 1971, 1977, and 1978, respectively.

Figure 2: Fourth Grade Reading, Science and Math Scores on the NAEP, 1971-1999



Source: 1971, 1977, and 1978 are the initial test years shown respectively in reading, science, and math. See U.S. Department of Education, National Center for Education Statistics, “Results Over Time: NAEP 1999 Long-Term Trend Summary Data Tables,” August 2000, available at nces.ed.gov/nationsreportcard/tables/Ltt1999.

As noted author and education researcher Andrew Coulson reports, “Student achievement has stagnated or fallen in most subjects since 1970... That is the verdict of the five most reliable sources of evidence: the National Assessment of Educational Progress (NAEP), the International Evaluation of Education Achievement (IEA), the Young Adult Literacy Survey (YALS), the National Adult Literacy Survey (NALS), and the International Adult Literacy Survey (IALS).”⁵³

Although the relationship between inputs and outcomes is more complicated than this linear analysis suggests, if the proponents’ arguments were correct, we should expect to see at least some relationship between the increased enrollment in early education programs and student achievement. This is particularly true when the states have, over the same period of time, more than tripled spending on education, increased teacher salaries, and reduced class sizes.⁵⁴

Certainly many factors contribute to student learning, but the lack of any apparent relationship between increased enrollment in early education programs and later student achievement suggests more formal early education is unlikely to improve student achievement.

How Do U.S. Children Perform? An International Examination

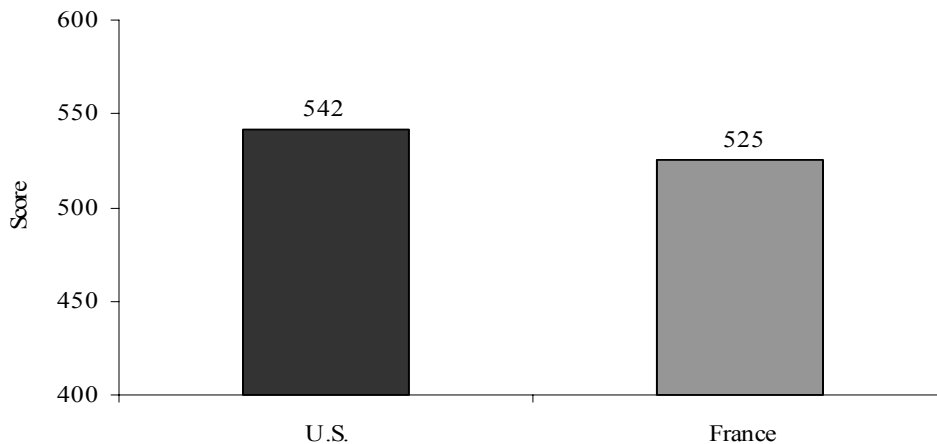
Advocates often point to France's *écoles maternelles* as the ideal model for early childhood education. According to Sandra Feldman, president emeritus of the American Federation of Teachers, the United States "can't afford not to" adopt a pre-primary program sculpted after the coveted French system.⁵⁵ Nearly all three- and four-year-olds in France are enrolled in center-based institutions.⁵⁶

Does the European model produce superior results?

If early education programs were essential building blocks for later school success, we would expect European students to have a stronger showing than U.S. students on international tests, particularly in the early elementary years. However, test scores reveal that U.S. students routinely outperform their international counterparts in reading, math, and science in fourth-grade—the earliest year for which comparative test scores are available.

Figure 3 shows that U.S. fourth graders demonstrate significantly better reading literacy skills than their French peers.⁵⁷

Figure 3: U.S. Fourth Grade Reading Literacy Scores Exceed French Scores, 2001



Source: U.S. Department of Education, National Center for Education Statistics, "International Comparisons in Fourth Grade Reading Literacy: Findings from the Progress in International Reading Literacy Study (PIRLS) of 2001," NCES 2003-073, April 2003, 5.

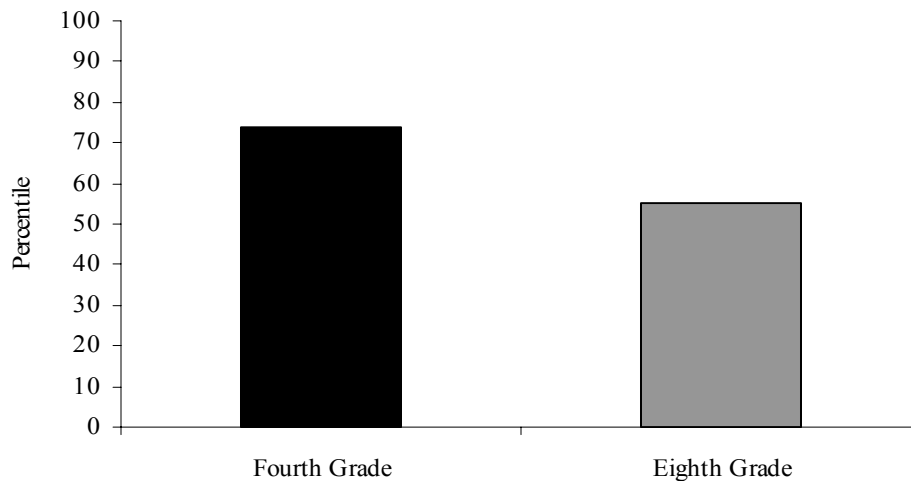
With a score of 542, U.S. fourth graders also perform significantly better than the international average of 500, and outperform their counterparts in twenty-six of the thirty-five countries participating in the literacy exam, including Germany and Italy, which have enrollment rates similar to France.⁵⁸ The top performance of U.S. readers was documented in an earlier version of the 2001 exam. On the 1991 version, U.S. fourth

graders surpassed students in France, East Germany, West Germany, and Italy with significant margins.⁵⁹

Test data from the Third International Mathematics and Science Study show U.S. fourth graders also have above-average math scores, and their science performance is third only to South Korea and Japan.⁶⁰ U.S. fourth graders earned a score of 545 in mathematics, performing significantly better than the international average of 529, and surpassing their counterparts in 14 out of 26 participating countries.⁶¹ In science, U.S. fourth graders scored 565, far above the international average of 524.

While U.S. fourth graders are “A” students on the international curve, that advantage does not last. By eighth grade, U.S. student performance is slipping, and test performance is mediocre. As David Hoff reported for *Education Week*, “In 1995, the nation’s fourth graders aced international mathematics and science tests. By the time they reached the 8th grade in 1999, though, they had become little better than C students on a global curve...”⁶² A similar decline occurs in reading. Figure 4 shows U.S. fourth graders score higher than 70 percent of their international peers while U.S. eighth graders perform little better than the international average.

Figure 4: Decline in U.S. Reading Literacy Performance by Grade Level

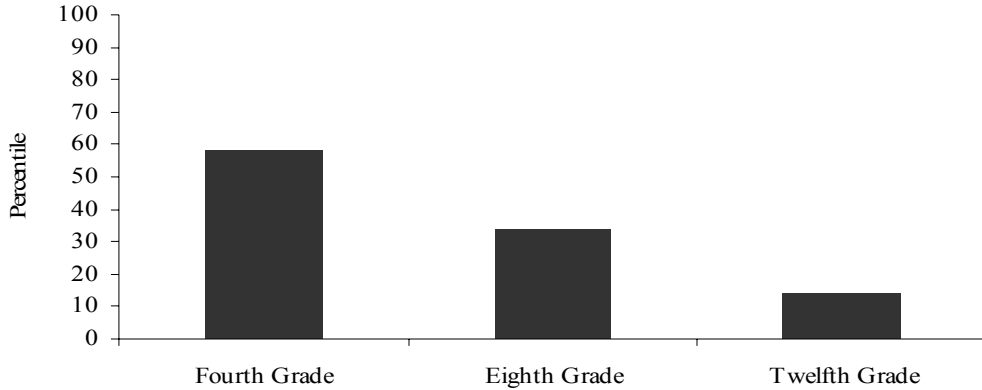


Source: Mullis et al., “PIRLS 2001 International Report: IEA’s Study of Reading Literacy Achievement in Primary Schools,” Boston College, 2003, Chapter 1, available at timss.bc.edu/pirls2001i/pdf/P1_IR_Ch01.pdf; and U.S. Department of Education, National Center for Education Statistics, “Outcomes of Learning: Results from the 2000 Program for International Student Assessment of 15-year-olds in Reading, Mathematics and Science Literacy,” December 2001, Chapter 2, available at nces.ed.gov/pubs2002/2002115.pdf.

Student performance continues declining, and by twelfth grade U.S. seniors are “D” students on the international scale.⁶³ Out of twenty-one countries tested in math and science literacy, U.S. twelfth graders performed better than students in only three countries—Lithuania, Cyprus, and South Africa.⁶⁴ As the U.S. Department of Education describes it, “U.S. students performed relatively well at the fourth-grade level, about

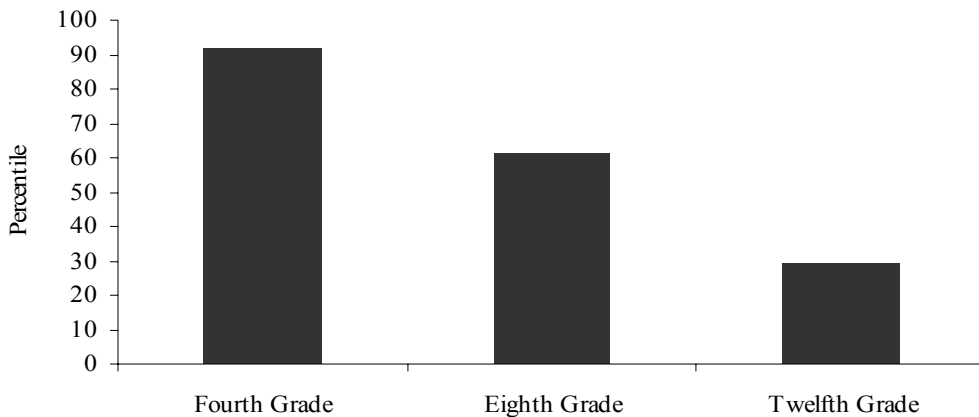
average at the eighth-grade level, and below average at the twelfth-grade level.”⁶⁵ Figures 5 and 6 illustrate the decline.

Figure 5: Decline in U.S. Math Performance by Grade Level



Sources: Fourth grade: “TIMSS highlights from the Primary Grades,” Boston College, June 1997: 2, Table 2, based on 1994-1995 TIMMS data, available at isc.bc.edu/timss1995i/TIMSSPDF/PIHiLite.pdf. Eighth grade: “TIMSS Highlights from the Middle School Years,” Boston College, November 1996: 2, Table 1, based on 1994-1995 TIMMS data, available at isc.bc.edu/timss1995i/HiLightB.html. Twelfth grade: “TIMSS Highlights from the Final School Years,” Boston College, February 1998: 2, Table 2, based on 1995-1996 TIMMS, available at isc.bc.edu/timss1995i/TIMSSPDF/C_Hilite.pdf.

Figure 6: Decline in U.S. Science Performance by Grade Level



Sources: Fourth grade: “TIMSS highlights from the Primary Grades,” Boston College, June 1997: 2, Table 2, based on 1994-1995 TIMMS data, available at isc.bc.edu/timss1995i/TIMSSPDF/PIHiLite.pdf. Eighth grade: “TIMSS Highlights from the Middle School Years,” Boston College, November 1996: 2, Table 1, based on 1994-1995 TIMMS data, available at isc.bc.edu/timss1995i/HiLightB.html. Twelfth grade: “TIMSS Highlights from the Final School Years,” Boston College, February 1998: 2, Table 2, based on 1995-1996 TIMMS, available at isc.bc.edu/timss1995i/TIMSSPDF/C_Hilite.pdf.

Figure 5 shows U.S. student score higher than 58 percent of their international peers in the fourth grade, but score higher than just 14 percent by twelfth grade. Figure 6 shows a

similar decline in science performance with U.S. students surpassing 92 percent of their international peers in fourth grade, but performing better than only 29 percent by twelfth grade.

What test scores reveal, then, is that U.S. students are strong competitors in the early elementary years, excelling in reading and science and performing above average in math. Over time, U.S. student performance declines and international students take the lead. Whatever the cause of that decline, however, it appears to have little or nothing to do with a lack of preparation in the early years. To the degree that international test data are informative, America's decentralized and flexible early education system is outperforming the European model and excels in equipping students for superior achievement in the elementary years.

Perry Preschool: Can \$1 Today Yield \$7 Tomorrow?

The Perry Preschool Project was a longitudinal experiment designed to study the effects of early intervention on severely disadvantaged children. It was the early intervention program most frequently cited in research reviews between 1983 and 1997, and is heavily cited in the literature and legislation in support of universal preschool.⁶⁶

Investigators at the High/Scope Educational Research Foundation in Ypsilante, Michigan, conducted the experiment from 1962 to 1965. The investigators reported their most recent findings in "Lifetime Effects: The High/Scope Perry Preschool Study through Age 40."⁶⁷ The project was an intervention program for three- and four-year-olds deemed to be at risk for "retarded intellectual functioning and eventual school failure."⁶⁸ It involved either one or two years of half-day preschool for seven months each year and periodic home visits. One hundred twenty-three children participated, 58 children in the experimental group and 65 in the control group. All of the children were of low socioeconomic status and had IQs in the range of 70 to 85.⁶⁹ The study is frequently cited because it is the longest running study of any preschool intervention program.

Analyses show that students who participated in the preschool program fared better over the long term on a variety of educational and social measures than did children in the control group. Lawrence J. Schweinhart, now president of the High/Scope Foundation, wrote, "Program participation had positive effects on adult crime, earnings, wealth, welfare dependence, and commitment to marriage."⁷⁰ On the basis of those findings, Schweinhart concluded, "The program provided taxpayers a return on investment of \$7.16 on the dollar."⁷¹ Advocates rely heavily on that figure to make their case that preschool is an investment that more than pays for itself in the long term.

The High/Scope researchers' interpretation of the long-term findings is that the preschool program prepared children for kindergarten, which resulted in a more positive reaction by kindergarten teachers that, in turn, caused the children to have a stronger commitment to school. That is sometimes called the snowball hypothesis. Three researchers from Yale University explain,

The snowball hypothesis presumes that children who attend quality intervention programs are better prepared socially and academically when they begin school. This enables them to interact positively with their teachers, who in turn relate positively to them, and this tone of adult child relationships continues in progressive years of school.⁷²

Others posit that the home visitation component was largely responsible for the results. They hypothesize that people became more effective parents as a result of their involvement in the program. Experiences such as building relationships with teachers may help parents establish a more supportive home environment and effective “homeschool linkages.”⁷³ At any rate, there is no consensus on which components of the program were responsible for the children’s gains. The critical question remains: how could a one- or two-year half-day preschool program produce such outstanding results?

The High/Scope researchers have been subject to heavy criticism for using nonstandard significance levels. If standard significance levels are used, many of the most “significant” differences between the experimental and control groups disappear.⁷⁴ Psychology professor Charles Locurto of the College of the Holy Cross in Massachusetts has argued that the Perry results are less remarkable when all findings—not just those that favor Perry—are considered. Locurto writes,

We might marry the large number of nonsignificant and unfavorable findings into a different picture of the Perry Project’s outcomes. We might argue that preschool training resulted in no differences in school motivation or school potential at the time of school entry, no lasting changes in IQ or achievement test performance... There were no differences in their average grades as compared to former-control-group children, in their personal satisfaction with their school performance or in their self-esteem. Their parents were no more likely to talk with teachers about school work or to attend school activities and functions than control-group parents. Preschool children were more likely to have been placed in remedial education. By age 19, they were unemployed at a rate equal to that of their control-group counterparts.⁷⁵

More important, questions have been raised concerning the Perry sample and methodology. According to Head Start co-founder and current Sterling Professor Emeritus of Psychology at Yale University, Ed Zigler,

[The Perry sample] was not only non representative of children in general; there is some doubt that it was representative of even the bulk of economically disadvantaged children...The Perry Project poses a number of methodological difficulties...Children had to have a parent at home during the day, resulting in a significant difference between control and intervention groups on the variable of maternal employment...[and] assignment to experimental and control groups was not wholly random.⁷⁶

Even if one believes the Perry findings are valid for disadvantaged children, they form a slippery basis for universal preschool, and caution is in order. First, in more than 40 years, no other program or study has produced results as dramatic as those found for Perry.⁷⁷ That suggests that there may have been unique conditions at the Perry Preschool that simply cannot be duplicated. As a general principle, science requires an experiment to be replicable before it is considered valid. Certainly caution is in order when it comes to applying findings to millions of children.

Second, benefits were obtained only for severely disadvantaged children at risk of “retarded intellectual functioning.” It is simply inappropriate to generalize the effects of Perry to mainstream children. This is particularly important given the research that shows early education programs do not always benefit, and may even be harmful to, mainstream children.

Third, Perry children may have outperformed children in the control group, but they still fared poorly compared with mainstream children. For example, nearly one-third of children participating in the intensive program dropped out of high school; nearly one-third of the children were arrested; and three of five participating children received welfare assistance as adults.⁷⁸ That has led many researchers to be more level-headed about the likely effects of early intervention:

Policymakers should not assume that the widespread enrollment of low-income children and families in early childhood programs will enable children living in poverty to perform later in school and life at the levels reached by more advantaged children.”⁷⁹

Finally, Perry differed significantly from regular preschool programs or what we could expect to see in a universal preschool program. The fact that no other preschool program has ever produced results akin to Perry may be testament to that.

The Carolina Abecedarian Project

Although it is neither a preschool nor kindergarten program, advocates often mention the Abecedarian project because of its unique long-term findings. The Abecedarian Project was launched in 1972 by researchers at the Frank Porter Graham Child Development Center in Chapel Hill, North Carolina, and involved 111 children deemed at risk on the basis of their parents’ income, education, and other factors. The mean age at entry into the program was 4.4 months. The infants were placed in an eight-hour-a-day, five-day-per-week, year-round educational day care center. They received free medical care, dietary supplements, and social service support for their families. From ages five through eight, half of the children from both the experimental and the control groups were given extra help in school and at home by specially trained teachers.⁸⁰

At every age from one-and-a-half to four-and-a-half years, children treated in preschool significantly outscored the control group on measures of intellectual development. At age

eight, test data showed significant positive effects of preschool treatment on intellectual test scores. A follow-up test at age twelve showed that the effects of preschool treatment on children's performance on intellectual tests and on reading and mathematics tests had been maintained into early adolescence. As the Abecedarian Project researchers note, "This represented a longer maintenance of preschool intervention gains than has typically been reported from previous projects concerned with similar children and families."⁸¹ Most recently, researchers examined the children's intellectual and academic performance at age twenty-one and found that students who had received the treatment "attained higher scores on both cognitive and academic tests, with moderate to large treatment effect sizes."⁸²

As with the Perry project, there is no consensus on which components of the program were responsible for the children's gains, although it has been suggested that the early cognitive gains were associated with greater mastery of academics, which led, in turn, to better performance thereafter.⁸³ The findings also provide support for the intensity or duration hypothesis, which predicts that longer, more intense programs result in the most advantages for children.⁸⁴

The Abecedarian Project has received some criticism, most notably from Herman H. Spitz, former director of the Research Department at the E. R. Johnstone Training and Research Center in Bordentown, New Jersey.⁸⁵ Spitz expressed concern that the project personnel presented certain results in ways that bias the findings in favor of Abecedarian. For example, by combining the IQ findings of the four cohorts studied, the researchers concluded that the intervention raised IQ. However, they neglected to report that scores improved only for two of the four groups. In fact, for the third and fourth cohorts, the experimental group actually lost 3.68 IQ points more than did the control group, providing no support for the efficacy of the intervention on this measure.⁸⁶

Spitz also points out that differences favoring the intervention group first emerged at six months of age, when those children's advantage was six points. He writes, "This is a rather surprising finding when one considers that the mean age of entry into the daycare center was 4.4 months."⁸⁷ The intervention groups' IQ advantage at five years of age was essentially the same as it had been at six months of age. Spitz asks, "What happened during the initial 1.6 months to produce essentially the same advantage for the intervention group that later was found at five and twelve years of age?"⁸⁸ He continues,

We need to understand why an additional 4.5 years of intensive intervention had so little effect that, at six years of age (and older), the difference between the intervention and control groups was not appreciably different than it had been at six months of age.⁸⁹

Spitz also argues that because of the ways the tests were conducted, some of the reported test results may be biased in favor of the Abecedarian Project.⁹⁰

Whether or not one takes the Abecedarian findings as wholly valid, there are several facts that should prevent legislators from basing policy recommendations for universal early

education on the study. First, the Abecedarian project did not include mainstream students, and benefits were obtained only for a small group of “economically disadvantaged African-American children.” The findings do not inform questions regarding mainstream children.

Second, Abecedarian was not a one-, two- or even three-year preschool or kindergarten intervention. It was an intensive intervention that created a home-away-from-home for infants and continued at an intensive level for more than five years. It was not akin to preschool or kindergarten programs. It was a full-time intervention from birth through age five that arguably few parents would find comfortable.

Finally, the Abecedarian Project was the first of its kind and has not been repeated. As the authors report, “The persistence into adulthood of the Abecedarian treatment effects on cognitive development is in contrast to the erosion of treatment/control test score differences in the Early Training Project and the High/Scope Perry Preschool Project, the only other randomized trials of early childhood intervention to have reported post-high school findings.”⁹¹ Because the Abecedarian Project was the first of its kind to demonstrate sustained results, it is important that it be replicated, and the factors leading to such anomalous findings are understood, before drawing further conclusions.

Whatever their merits, neither Perry Preschool nor Abecedarian speaks to mainstream children nor to the type of preschool or kindergarten programs proposed by today’s policymakers. Additionally, both were model projects that treated a small group of children in specific conditions. Could those effects be expected of widespread public programs? On this point, information on Head Start is informative. Head Start is the government’s longest running preschool program for disadvantaged children and it has failed to produce long-term academic advantages for participants.

Head Start

Research on Head Start is valuable because it is a large program operating under real-world conditions and constraints, and research has been conducted over a forty-year period. Head Start has more than 1,300 preschool projects serving about 457,000 disadvantaged children. The information about the effects of Head Start can serve as a close approximation of what one might expect from a universal preschool education for disadvantaged children.

Like many of today’s early education advocates, former president Lyndon B. Johnson sold his program to the public by promising that early intervention could prevent delinquency, poverty, and welfare use.⁹² The reality of Head Start has been much different. Head Start programs have had mixed short-term results. Consistent with broad findings on early education, however, Head Start students have not demonstrated lasting achievement gains.

In 1997, the General Accounting Office (GAO) conducted a thorough analysis of Head Start’s impact.⁹³ After speaking with early childhood researchers and practitioners and

searching through electronic databases to locate published and unpublished manuscripts, the GAO found nearly 600 citations and documents. Of those, only twenty-two studies fit their criteria for review, and even those “had some methodological problems.”⁹⁴ No study used a nationally representative sample so that findings could be generalized to the national program. The GAO concluded, “The body of research on current Head Start is insufficient to draw conclusions about the impact of the national program.”⁹⁵

The Department of Health and Human Services (HHS) has maintained that research proves Head Start’s effectiveness. In a letter to the GAO, June Gibbs Brown, then inspector general of HHS, wrote, “There is clear evidence of the positive impacts of Head Start services.”⁹⁶ For supporting evidence, HHS cited findings from a comprehensive synthesis of Head Start impact studies conducted under HHS auspices in 1985.⁹⁷ The study showed that Head Start could have an immediate positive impact on cognitive measures, social behavior, and child health. However, HHS neglected to mention the rest of the findings—namely that the short-term impact of Head Start diminished once the children entered school. The synthesis concludes,

In the long run, cognitive and socioemotional test scores of former Head Start students do not remain superior to those of disadvantaged children who did not attend Head Start.⁹⁸

On the three cognitive measures tested (IQ scores, school readiness, and achievement test scores), the report found,

Once the children enter school there is little difference between the scores of Head Start and control children... Findings for the individual cognitive measures—intelligence, readiness and achievement—reflect the same trends as the global measure... By the end of the second year there are no educationally meaningful differences on any of the measures.⁹⁹

Findings on children’s social behavior, achievement motivation, and self-esteem were similar:

On social behavior, former Head Start enrollees... drop to the level of comparison children by the end of the third year. On achievement motivation and self-esteem, Head Start children drop below non- Head Starters a year after Head Start, then score about the same as comparison children for the next two years.¹⁰⁰

In 2003, researchers released a new study on Head Start with a nationally representative sample of 2,800 children in forty-three different Head Start programs called “Head Start FACES 2000.” The report seems to confirm earlier findings. The researchers report, “Despite the gains they make, Head Start children enter kindergarten still substantially below national averages on such assessments.”¹⁰¹ Longer-term assessments have not yet been conducted, but are currently under way by Westat.

Experience in Georgia: \$1.15 Billion on Universal Preschool Bears No Fruit

In 1993, the Georgia State Legislature established a no-fee pre kindergarten program now serving an estimated 63,000 four-year-old preschoolers. Using the Georgia Kindergarten Assessment Program (GKAP), in 1999 researchers at Georgia State University tested children who had participated in the preschool program and compared their scores to all students in the state during the kindergarten year. Both groups scored well, but their scores were indistinguishable. The researchers concluded,

Eighty-eight percent of the study sample scored a five on the capability item, compared to 85 percent of all students across the state scoring similarly. Statistical tests indicate that overall these differences are not significant. In other words, the study sample does not differ from the entire kindergarten population in GKAP capability scores.¹⁰²

Reports also show that GKAP scores are essentially the same as they were before Georgia adopted the universal preschool program. Linda Schrenko, then Georgia state school superintendent, expressed the state's disappointment, saying, "The only message you can get from it is that our kindergarten non-ready rate [7 percent of students] is the same, regardless of what we do."¹⁰³

In 2003, Georgia State University researchers released the latest findings from the fifth and final year of the longitudinal study of the prekindergarten program. In the final report, they write,

Previous research has shown that cognitive gains as measured by standardized test scores are associated with preschool experiences but are not sustained in later years...It should not be surprising to find that the test scores of children, all of whom participated in a pre-k program four years before are not systematically different.¹⁰⁴

The researchers show the test scores of children who remained on grade level and who were not exempted from state testing by virtue of their individualized education plans, and report their average percentile test scores in math, language arts, science and social studies: all fall below the national average and are not systematically different from Georgia's average student performance.¹⁰⁵

Other findings on grade level retention and curriculum are also informative. The researchers report, "About 15 percent of the children were retained at least once by their fourth year of primary school."¹¹¹ ¹⁰⁶ Within the preschool control group, researchers were also able to assess the impact of varying types of preschool curriculum and found, "Students' economic backgrounds have more influence on their educational success after pre-k than curriculum choice and teacher credentials."¹⁰⁷ Lead researcher Gary Henry writes,

Program characteristics made only small differences in retention and test scores. These differences are much less dramatic than some of the differences based on parental education or socio-economic status... There is no magic bullet here. No one thing is waiting in the wings to increase scores for all students...¹⁰⁸

After ten years, the Georgia preschool program has served over 300,000 children at a cost of \$1.15 billion and children's test scores are unchanged.¹⁰⁹

Recommendations

1. Increase Transparency

We recommend the Arizona Legislature bring transparency to current spending by identifying, documenting, and tracking the amount of federal and state spending on child care, preschool, and kindergarten programs in Arizona. In conducting this analysis, we reach the same conclusions on the quality of financial data reached by Arizona State University (ASU) researchers who compiled "The Condition of Early Childhood Education and Care in Arizona: 2004." They concluded, "The data on early childhood education and care (ECEC) in Arizona are poor," and recommended that the School Readiness Board be given "the authority and funding to identify and track annually the amount of federal and state dollars invested in ECEC."¹¹⁰ We recommend consideration of this function by the Auditor General's office or another independent body to reduce any potential conflict of interest that might undermine the objectivity required in such an analysis.

2. Assess Impact

As a matter of good public policy, we recommend the legislature require an impact assessment of early education expenditures. This is particularly important in light of empirical evidence demonstrating the inability of early education programs to improve academic performance. We concur with ASU findings that,

The variety of agencies and groups involved and the lack of a systematic and coordinated statewide data plan make it difficult to evaluate the validity, integrity, and consistency of the ECEC available data... Pre-school and kindergarten enrollment data are not systematically collected or organized...¹¹¹

There is almost no information available on the impact of the more than \$410 million spent annually on these programs on student learning.¹¹²

3. Transform Current Spending into Grants

To the degree that the state continues to be involved in early education, we recommend funding be modified into direct education grants to families. The arguments for a flexible funding system of per-child grants have been made extensively elsewhere.¹¹³ We discuss just a few important considerations here.

The best available estimates show that Arizona currently spends more than \$410 million annually on early education programs.¹¹⁴ Of that, an estimated \$134 million is spent on kindergarten, a conservative figure that does not include the multiple funding streams being used by school districts to provide kindergarten or parent fees.¹¹⁵ Nonetheless, the amount is sufficient to give a kindergarten grant worth \$1,950 to every kindergartner in Arizona.¹¹⁶ If grants were targeted to kindergartners whose family incomes were equal to or less than 185 percent of the federal poverty line (an estimated 42 percent of kindergartners), grants could be an estimated \$4,650 per child.¹¹⁷

The best estimates also show Arizona spends \$265 million annually on non-kindergarten early education programs, an amount sufficient to give every four-year-old in Arizona a grant of \$3,460.¹¹⁸ If grants were restricted to children whose family incomes were equal to or less than 185 percent of the federal poverty level, current spending could transform into grants in the estimated amount of \$8,240 per child.¹¹⁹

These figures are not intended to be prescriptive or definitive, but rather to illustrate the amount of money currently spent on these early education programs and the possibility of using those funds more efficiently through per child grants.

At current spending levels, the grant amounts could be sufficient to assist parents' choice among a range of private providers. A recent Goldwater Institute survey of Arizona private schools finds the average tuition for private elementary schools is an estimated \$3,700.¹²⁰ This figure is aligned with national figures from the U.S. Department of Education that report the average private elementary school tuition is \$3,267.¹²¹

Absent a grant program that uses the private sector, the further provision of state-run early education is likely to inflate costs. The Arizona School Readiness Task Force says quality preschool costs at least \$7,000 to \$10,000 per child.¹²² Similarly, the National Institute for Early Education Research estimates the per-child cost at \$8,700.¹²³ As with the provision of K-12 education, publicly run preschool and kindergarten will likely cost significantly more than privately provided options.

Making use of private providers will also help reduce construction costs, which are projected at \$100 million for Governor Napolitano's kindergarten plan.¹²⁴ The practical approach of making use of the private sector was a key factor in Florida's recent decision to implement preschool through a grant system.¹²⁵ On January 2, 2005, Florida governor Jeb Bush signed a bill allowing Florida four-year-olds to attend the preschool programs of their parents' choice—including private centers. The per child cost is expected to be between \$2,000 and \$3,000.¹²⁶

Alex Penelas, the democratic mayor of Miami-Dade County who championed the initiative, said he was working all the time under the assumption that parents would be able to choose either a public or private school for their children, saying, “That’s more a practicality of having 90,000 children arrive on the doorstep.”¹²⁷ Author of the Florida senate bill creating the program, senator Lisa Carlton (RSarasota), concurred, saying, “Because we don’t have enough spaces in the public schools, it’s necessary for Florida to partner with the private sector.”¹²⁸

Akin to Florida’s flexible system, we recommend parents be allowed to spend their grants in any public or private preschool or kindergarten program of their choice. Policymakers should ensure the continued independence of private providers. This will allow families to choose from a diversity of curricula, hours, and standards that suit individual student learning needs.

New state-run programs may also threaten the private and parochial provision of services, and with them, the diversity that is critical to meeting student needs. England’s experience is instructive in this regard. The Department for Education and Employment worked vigorously to provide free preschool places for all four year-olds and most three-year-olds by 2002. The BBC news reported, “The developments have proved disastrous for the private and voluntary sector.”¹²⁹ More than 2,000 groups have closed since 1997 and 1,500 avoided closure only because of emergency funding from the government.¹³⁰

Arizona policymakers have the opportunity to transform current expenditures into a flexible system that can provide for a more cost-effective use of funds, greater choice for parents, and a wider range of opportunity for students.

Conclusion

Gov. Janet Napolitano has argued that “Today in America, we are trying to prepare students for a high tech world of constant change, but we are doing so by putting them through a school system designed in the early twentieth century that has not seen substantial change in thirty years.”¹³¹ We agree, and elsewhere have argued for fundamentally changing the school system through the powerful mechanism of school choice.¹³² Yet, the governor has proposed an expansion of the status quo.

To the degree that the state remains involved in early education, we recommend adopting a flexible system of per-child grants. Current state spending on kindergarten is sufficient to give a kindergarten grant worth \$1,950 to every kindergartner in Arizona. We note this is a conservative estimate that does not include multiple sources of revenue currently generated by school districts or parent fees, which could also be used to augment the amount. If grants were targeted to children in families of modest means, kindergarten grants could be an estimated \$4,650 per student.

Empirical evidence suggests more early education will do little to improve children’s long-term education outcomes. We summarize some key findings here:

- The National Center for Education Statistics' longitudinal study of 22,000 children finds no lasting reading, math, or science achievement differences between children who attend half-day and full-day kindergarten. "This report did not detect any substantive differences in children's third-grade achievement relative to the type of kindergarten program (full-day vs. half-day) they attended."¹³³
- After ten years, the Georgia preschool program has served over 300,000 children at a cost of \$1.15 billion and children's test scores are unchanged. "The study sample does not differ from the entire kindergarten population in GKAP capability scores."¹³⁴
- Head Start, the nation's largest preschool program for disadvantaged children, has not measurably improved educational outcomes. "Once the children enter school there is little difference between the scores of Head Start and control children... Findings for the individual cognitive measures—intelligence, readiness and achievement—reflect the same trends as the global measure... By the end of the second year there are no educationally meaningful differences on any of the measures."¹³⁵
- Historic trends are not encouraging. The preschool enrollment rate of four-year-olds has climbed from 16 percent to 66 percent since 1965. Despite the change from home education to formal early education, student achievement has stagnated since 1970. If early education programs were essential building blocks for success, we would expect to see at least some relationship between that increased enrollment and student achievement.
- The French model of early education is not encouraging. French students have significantly lower literacy rates than U.S. students as measured in fourth grade, the earliest year for which comparative data are available.
- America's flexible approach to early education gives children a strong foundation, according to widely used proxy measures of preparedness, concrete skills assessments, and reports by kindergarten teachers. We find further evidence of the strength of our early education system in international comparisons, which show U.S. fourth graders are "A" students on the international curve, excelling in reading and science and performing above average in math.
- By twelfth grade, U.S. students are "D" students on the international scale, a decline occurring after fourth grade. Whatever the cause of that decline, it appears to have little or nothing to do with a lack of preparation in the early years.

For these reasons, among others, we strongly recommend against "ensconcing early care and education as a lockstep component of public schooling," and recommend alternative measures for improving Arizona's education system—including transparency, impact assessment, and individual student funding.

Notes

¹ Janet Napolitano, "Governor Napolitano's School Readiness Action Plan," Office of the Governor, State of Arizona, January 22, 2004: 3, 7.

² Janet Napolitano, "Remarks to Supporters of the National Task Force on Public Education," Mayflower Hotel, Washington, D.C., April 22, 2004: 4.

³ Napolitano, "Governor Napolitano's School Readiness Action Plan," 2.

⁴ Tom Horne, "Our views on all-day kindergarten," *Arizona Republic*, November 21, 2004, V2.

⁵ Janet Napolitano, Message of the Week, February 18, 2004, available at 209.157.64.200/focus/f-news/1080764/posts (accessed January 18, 2005).

⁶ The exception is the United Kingdom, where enrollment of three-year-olds is 52 percent. U.S. Department of Education, National Center for Education Statistics, "Comparative Indicators of Education in the United States and Other G-8 Countries: 2002," NCES 2003 026, May 2003: 26. Also available at nces.ed.gov/pubs2003/2003026.pdf (accessed January 18, 2005).

⁷ W. Steven Barnett *et al.*, "The State of Preschool: 2004 State Preschool Yearbook," National Institute for Early Education Research, 2004, available at nieer.org/yearbook/pdf/yearbook.pdf (accessed January 18, 2005).

⁸ Michael Kelley, Joseph Tobin, and Karen Ortiz, "The Condition of Early Childhood Education and Care in Arizona: 2004," policy brief in "The Condition of Pre-K-12 Education in Arizona: 2004," Education Policy Studies Laboratory, Arizona State University, May 2004: 2-12.

⁹ "Short term" is defined as one to three years after program participation. For further reading, see Arthur J. Reynolds *et al.*, "The State of Early Childhood Intervention: Effectiveness, Myths and Realities, New Directions," *Focus* 1, 19 (Summer/Fall 1997): 6. See also Donna Bryant and Kelly Maxwell, "The Effectiveness of Early Intervention for Disadvantaged Children," in *The Effectiveness of Early Intervention*, Michael J. Guralnick, ed. (Baltimore, Md: Paul H. Brookes Publishing Co., 1997): 23-46.

¹⁰ The questions and answers in this survey reflect views on child care systems. However, "child advocates" regularly use the term "early childhood care and education," which reflects the belief that child care and education are considered joint—not separate—functions. The survey is informative about parents' and advocates' basic beliefs regarding the appropriate role of government in the child care and early education arena. Public Agenda, "Necessary Compromises: How Parents, Employers and Children's Advocates View Child Care Today," *Public Agenda*, 2000: 11-13.

¹¹ See Darcy Olsen, "Mandatory preschool another power grab," *Milwaukee Journal Sentinel*, August 2, 2001, available at www.cato.org/dailys/08-14-01.html (accessed January 18, 2005).

¹² Zell Miller, cited in Jodie Morse, "Preschool for Everyone," *Time*, November 9, 1998.

¹³ Vermont state legislator Bill Suchmann passed away in 2001. See "VT GOP Mourns Passing of Former Representative Bill Suchmann," available at www.vermontgop.org/suchmann.shtml (accessed January 18, 2005). See also Anne Geggis, "Mandatory preschool?" *Burlington Free Press*, February 16, 1998.

¹⁴ This paper does not examine the day care debate. For analysis on the availability, affordability, and quality of child-care arrangements, see Darcy Olsen, "The Advancing Nanny State: Why the Government Should Stay Out of Child Care," Cato Institute Policy Analysis no. 285, October 23, 1997; Robert Rector, "Facts about American Families and Day Care," Heritage Foundation FYI no. 170, January 21, 1998; Linda Giannarelli, Sarah Adelman, and Stefanie Schmidt, "Getting Help With Child Care Expenses," Urban

Institute, Occasional Paper no. 62, February 2003; and Arizona Department of Economic Security, "Child Care Market Rate Survey 2000," August 2000.

¹⁵ Horne, "Our Views on All-Day Kindergarten."

¹⁶ Napolitano, "Message of the Week."

¹⁷ State School Readiness Board, "Summary of Priority Recommendations," November 18, 2003: 5.

¹⁸ Edward Zigler, Cara Taussig, and Kathryn Black, "Early Childhood Intervention: A Promising Preventative for Juvenile Delinquency," *American Psychologist* 47, no. 8 (August 1992): 1000.

¹⁹ This discussion does not consider the health or nutrition components of early intervention programs. "Long term" is defined as four or more years after program participation. Most studies of this kind are impaired by high attrition rates and selection bias and are limited in statistical power and generalizability. For reviews, see Walter Gilliam and Ed Zigler, "A Critical Meta- Analysis of All Evaluations of State-Funded Preschool from 1977 to 1998: Implications for Policy, Service Delivery and Program Evaluation," *Early Childhood Research Quarterly* 15, no. 4 (Winter 2000): 441-473; Reynolds et al., "The State of Early Childhood Intervention: Effectiveness, Myths and Realities, New Directions," 6; Bryant and Maxwell, "The Effectiveness of Early Intervention for Disadvantaged Children," 23-46; and Nancy L. Karweit, "Effective Preschool Programs for Students at Risk," in *Effective Programs for Students at Risk*, R. E. Slavin, ed. (Needham, Mass.: Allyn and Bacon, 1989): 75-102.

²⁰ David Weikart cited in Kenneth T. Walsh, "The three R's and the big P," *U.S. News & World Report*, August 30, 1999, 26.

²¹ David Elkind, *Miseducation: Preschoolers at Risk* (New York: Knopf, 1997): 69.

²² *Ibid.*, 4.

²³ For a summary of current trends in universal programs, see Susan Block, "In the Beginning: Good Preschools Have Much to Offer, But Should They Be Universal? Some Research Suggests Otherwise," *American School Board Journal*, November 2003, available at www.asbj.com/2003/11/1103research.html (accessed January 18, 2005).

²⁴ The National Education Goals Panel (NEGP) has been dissolved pursuant to congressional mandate. NEGP publications are available online at govinfo.library.unt.edu/negp/.

²⁵ For discussion on readiness and kindergarten curriculum, see Richard Rothstein, "Lessons: In the Kindergartens, A Misguided Push," *New York Times*, March 21, 2001; Lorrie A. Shepard, "Children Not Ready to Learn? The Invalidity of School Readiness Testing," *Psychology in the Schools* 34, no. 2 (1997): 85-97; Patricia L. de Cos, "Readiness for Kindergarten: What Does It Mean?," California Research Bureau, California State Library, RB-97-014, December 1997; and Yolanda Bellisimo, Colin H. Sacks, and John R. MerDeborah May, *et al.*, "School Readiness: An Obstacle to Intervention and Inclusion," *Journal of Early Intervention* 18, no. 3 (1994): 290-301.

²⁶ Other measures include physical health indicators, which are not addressed in this analysis. See also Pascal Forgione, U.S. Commissioner of Education Statistics, "Early Childhood Education: Critical Data Needs for a Critical Period of Child Development," Testimony before the Committee on Labor and Human Resources Hearing, U.S. Senate, December 17, 1999.

²⁷ U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 2003*, Table 43, available at nces.ed.gov/programs/digest/d03/tables/dt043.asp (accessed January 18, 2005).

²⁸ Kathryn Chandler, "Home Literacy Activities and Signs of Children's Emerging Literacy, 1993 and 1999," National Center for Education Statistics, *Statistics in Brief*, NCES 2000-026, November 1999.

²⁹ Nicholas Zill and Jerry West, "Entering Kindergarten: A Portrait of American Children When They Begin School," U.S. Department of Education, National Center for Education Statistics, NCES 2001-035, January 2001: 6.

³⁰ U.S. Department of Education, National Center for Education Statistics, "America's Kindergartners," NCES 2000-070, February 2000: 16.

³¹ *Ibid.*, 17.

³² Ninety-six percent rank physical health as very important or essential, followed by 84 percent ranking communicating needs as very important or essential, followed by 76 percent ranking enthusiasm in approaching new activities as very important or essential. We do not examine the second factor, communication, because there is no corresponding measure for this factor in the NCES data. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics 1996*, Table 48, available at nces.ed.gov/programs/digest/d96/D96T048.asp (accessed January 18, 2005).

³³ Parents report that 92 percent of children are eager to learn. However, teachers report that 75 percent are eager to learn—highlighting the subjective nature of these measures. U.S. Department of Education, "America's Kindergartners," 39, 45.

³⁴ U.S. Department of Education, *Digest of Education Statistics 1996*, Table 48.

³⁵ Monica Mendoza, "Governor will push early-ed programs," *Arizona Republic*, January 11, 2004.

³⁶ Monica Mendoza, "Kindergarten for all children, all day? Discussion gaining wider national audience," *Arizona Republic*, December 12, 2004; Paul Davenport, "Controversial education issues await legislators," *Associated Press State & Local Wire*, December 6, 2004; and, Le Templar, "All-day kindergarten touted," *East Valley Tribune*, February 17, 2004.

³⁷ Janet Napolitano, testimony on Senate Bill 1362, February 16, 2004.

³⁸ Monica Mendoza, "Seeking a fix for education Arizona looks to North Carolina for academic model," *Arizona Republic*, September 17, 2003.

³⁹ Donald T. Campbell and Julian C. Stanley, *Experimental and Quasi-Experimental Designs for Research* (Boston: Houghton Mifflin Company, 1963).

⁴⁰ Alhambra School District No. 68, "Alhambra Elementary School District Comparison Study Showing the Benefits of Preschool/Full-Day Kindergarten Education," September 2003.

⁴¹ *Ibid.*

⁴² For background, see Anne T. Henderson and Nancy Berla, eds., "A New Generation of Evidence: The Family is Critical to Student Achievement," Center for Law and Education, Washington, D.C.; and U.S. Department of Education, "Strong Families, Strong Schools," U.S. Government Printing Office, 1995-392-051, September 1994.

⁴³ Chino Valley Unified School District No. 51, Office of the Superintendent, “Academic Benefits of Full Day Kindergarten,” no date. This two-page report from the Office of the Superintendent must be taken at face value because it does not include any supporting data.

⁴⁴ Benchmark is defined as “on track to read at grade level.”

⁴⁵ Tom Horne, “Kindergarten Report: Half Day and Full Day Programs,” Department of Education, State of Arizona, Fall 2004.

⁴⁶ For a comprehensive review of kindergarten research prior to the NCES findings, see James Elicker, “Full-Day Kindergarten: Exploring the Research,” From Inquiry to Practice, Phi Delta Kappa International, Bloomington, Indiana, 2000. Elicker concludes that “students participating in full-day kindergarten consistently progress further academically during the kindergarten year, as assessed by achievement tests, than students in either half day or alternate-day programs... There is not current, strong evidence that the academic achievement gains of full-day kindergarten persist beyond first grade for all students... More research is needed to examine the long-term impact of full-day kindergarten,” *Ibid.*, 8-9.

⁴⁷ Jerry West, Kristin Denton, and Lizabeth M. Reaney, “The Kindergarten Year: Findings from the Early Childhood Longitudinal Study, Kindergarten Class of 1998-99,” U.S. Department of Education, National Center for Education Statistics, 11, available at nces.ed.gov/pubs2001/2001023.pdf (accessed January 18, 2005).

⁴⁸ Kristin Denton, Jerry West, and Jill Walston, “Reading—Young Children’s Achievement and Classroom Experiences,” U.S. Department of Education, National Center for Education Statistics, NCES 2003-070, July 2003, 13, available at nces.ed.gov/pubs2003/2003070.pdf (accessed January 18, 2005).

⁴⁹ West, Denton, and Reaney, “The Kindergarten Year: Findings from the Early Childhood Longitudinal Study,” Table 2, 44, available at nces.ed.gov/pubs2001/2001023.pdf (accessed January 18, 2005).

⁵⁰ Amy Rathburn, Jerry West, and Elvira Germino-Hausken, “From Kindergarten Through Third Grade: Children’s Beginning School Experiences,” U.S. Department of Education, National Center for Education Statistics, NCES 2004-007, August 2004, 33, available at nces.ed.gov/pubs2004/2004007.pdf (accessed January 18, 2005).

⁵¹ *Ibid.*, 24.

⁵² U.S. Department of Education, *Digest of Education Statistics, 2003*.

⁵³ Andrew Coulson, *Market Education* (London: Transaction Publishers, 1999): 179.

⁵⁴ Between 1959-60 and 1989-90, inflation-adjusted spending more than tripled. See Andrew Coulson, *Market Education*, 32. From 1959-60 to 2001-02, average annual salaries for elementary and secondary teachers rose from \$36,000 to \$44,000 (in constant dollars). See U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 2002*, available at nces.ed.gov/programs/digest/d02/dt077.asp (accessed January 18, 2005). Pupil-to-teacher ratios in public schools have declined from one teacher for every 26 students in 1960 to one teacher for every 16 students in 2002. See U.S. Department of Education, *Digest of Education Statistics, 2003*.

⁵⁵ Sandra Feldman, Remarks to the AFT QuEST Conference, July 12, 2001, available at www.aft.org/press-center/speeches-columns/speeches/feldman071201.htm (accessed January 18, 2005). See also Ann Dryden Witte and Marisol Trowbridge, “The Structure of Early Care and Education in the United States: Historical Evolution and International Comparisons,” NBER *Working Paper* No. 10931, November 2004.

⁵⁶ U.S. Department of Education, "Comparative Indicators of Education in the United States and Other G-8 Countries: 2002."

⁵⁷ U.S. Department of Education, National Center for Education Statistics, "International Comparisons in Fourth-Grade Reading Literacy: Findings from the Progress in International Reading Literacy Study (PIRLS) of 2001," NCES 2003-073, April 2003, 5.

⁵⁸ More than 50 percent of three year-olds and 75 percent of four-year olds in Germany, Italy, and the United Kingdom attend center-based institutions. *Ibid.*

⁵⁹ U.S. Department of Education, National Center for Education Statistics, "Elementary and Secondary Education: An International Perspective," NCES 2000-033, March 2000, 56.

⁶⁰ U.S. students outperformed 23 out of 26 participating countries. Students in Italy, Germany, and France did not participate in this exam. See "TIMSS Highlights from the Primary Grades," available at timss.bc.edu/timss1995i/TIMSSPDF/P1HiLite.pdf (accessed January 18, 2005).

⁶¹ U.S. students performed better than those in the United Kingdom. Students in Italy, Germany, and France did not participate in this exam. *Ibid.*

⁶² David J. Hoff, "U.S. Students' Scores Drop by 8th Grade," *Education Week*, December 13, 2000.

⁶³ For a summary of math and science scores, see International Association for the Evaluation of Educational Achievement, "Mathematics and Science Achievement in the Final Year of Secondary School: IEA's Third International Mathematics and Science Study," February 1998, available at isc.bc.edu/timss1995i/MathScience C.html (accessed January 18, 2005).

⁶⁴ U.S. students scored 471, significantly below the international average of 500. *Ibid.*

⁶⁵ U.S. Department of Education, National Center for Education Statistics, "Elementary and Secondary Education: An International Perspective," NCES 2000-033, March 2000, 51.

⁶⁶ Reynolds *et al.*, 8.

⁶⁷ Lawrence J. Schweinhart, "The High/Scope Perry Preschool Study Through Age 40," High/Scope Educational Research Foundation. See www.highscope.org/welcome.asp for official publication date.

⁶⁸ Zigler, Taussig, and Black, 1,000.

⁶⁹ For a complete program description, see Lawrence Schweinhart and David Weikart, "The Effects of the Perry Preschool Program on Youths through Age 15: A Summary," in the *Consortium for Longitudinal Studies, As the Twig Is Bent—Lasting Effects of Preschool Programs* (Hillsdale, N.J.: Lawrence Erlbaum Associates, 1983): 71-81.

⁷⁰ Lawrence J. Schweinhart, "Lasting Benefits of Preschool Programs," *ERIC Digest* EDO PS-94-2 (January 1994).

⁷¹ Lawrence J. Schweinhart, *Significant Benefits: The High/Scope Perry Preschool Study through Age 27* (Ypsilante, Mich.: High/Scope Press, 1993): 55; and Schweinhart, "Lasting Benefits of Preschool Programs," 2.

⁷² Zigler, Taussig, and Black, 1,002.

⁷³ *Ibid.*, 1,000.

- ⁷⁴ Charles Locurto, "Beyond IQ in Preschool Programs?" *Intelligence* 15 (1991): 299-305.
- ⁷⁵ *Ibid.*, 303-304.
- ⁷⁶ Zigler, "Formal Schooling for Four-Year-Olds? No," 30-31.
- ⁷⁷ Ron Haskins, "Beyond Metaphor: The Efficacy of Early Childhood Education," *American Psychologist* 44, no. 2 (February 1989): 279.
- ⁷⁸ Schweinhart, *Significant Benefits*, 59, 86, 106.
- ⁷⁹ Deanna S. Gomby *et al.*, "Long-Term Outcomes of Early Childhood Programs: Analysis and Recommendations," in *The Future of Children* 5, no. 3 (Winter 1995): 14.
- ⁸⁰ For background on the Abecedarian Project, see Frances A. Campbell and Craig T. Ramey, "Cognitive and School Outcomes for High-Risk African-American Students at Middle Adolescence: Positive Effects of Early Intervention," *American Educational Research Journal* 32, no. 4 (Winter 1995): 743-72; and Craig T. Ramey, Frances A. Campbell, and Clancy Blair, "Enhancing the Life Course for High-Risk Children: Results from the Abecedarian Project," in Jonathan Crane, ed., *Social Programs That Work* (New York: Russell Sage Foundation: 1998): 179-180.
- ⁸¹ Campbell and Ramey, 750-752.
- ⁸² Campbell *et al.*, "The Development of Cognitive and Academic Abilities: Growth Curves from an Early Childhood Educational Experiment," *Developmental Psychology* (March 2001): 231-242.
- ⁸³ Campbell and Ramey, 766.
- ⁸⁴ Bryant and Maxwell, 34.
- ⁸⁵ Spitz left Johnstone in 1989. Since then he has published several papers on the Abecedarian Project, including Herman H. Spitz, "Some Questions about the Results of the Abecedarian Early Intervention Project Cited by the APA Task Force on Intelligence," *American Psychologist* 52, no. 1 (January 1997): 72; Herman H. Spitz, "When Prophecy Fails: On Ramey's Response to Spitz's Critique of the Abecedarian Project," *Intelligence* 17 (1993): 17-23; Herman H. Spitz, "Spitz's Reply to Ramey's Response to Spitz's First Reply to Ramey's First Response to Spitz's Critique of the Abecedarian Project," *Intelligence* 17 (1993): 31-35; Herman H. Spitz, "Early Educational Intervention Research and Cronbach's Two Disciplines of Scientific Psychology," *Intelligence* 17 (1993): 251- 255; Herman H. Spitz, "Does the Carolina Abecedarian Early Intervention Project Prevent Sociocultural Mental Retardation?" *Intelligence* 16 (1992): 225-237; and Herman H. Spitz, "Commentary on Locurto's 'Beyond IQ in Preschool Programs?'" *Intelligence* 15(1991): 327-333.
- ⁸⁶ Spitz, "Does the Carolina Abecedarian Early Intervention Project Prevent Sociocultural Mental Retardation?": 228-229.
- ⁸⁷ Spitz, "Some Questions about the Results of the Abecedarian Early Intervention Project Cited by the APA Task Force on Intelligence," 72.
- ⁸⁸ *Ibid.*
- ⁸⁹ Spitz, "Spitz's Reply to Ramey's Response to Spitz's First Reply to Ramey's First Response to Spitz's Critique of the Abecedarian Project," 35.

⁹⁰ For example, Spitz explains that mothers of the experimental group were present at the testing and assisted in the administration of some tests. That means that the mothers may have provided their children with practice on some of the test items. Spitz, "Does the Carolina Abecedarian Early Intervention Project Prevent Sociocultural Mental Retardation?": 231-232.

⁹¹ Campbell *et al.*, "The Development of Cognitive and Academic Abilities: Growth Curves from an Early Childhood Educational Experiment," 231-242.

⁹² See U.S. Department of Health, Education, and Welfare, Office of Child Development, "Recommendations for a Head Start Program by a Panel of Experts," February 19, 1965: 17. This report is now available from the Department of Health and Human Services, Administration for Children, Youth and Families; and Lyndon B. Johnson, *Public Papers of the Presidents of the United States: Lyndon B. Johnson, Book 1, January 1 to May 31, 1965* (Washington: Government Printing Office, 1966): 556.

⁹³ U.S. General Accounting Office, "Head Start: Research Provides Little Information on Impact of Current Program," GAO/HEHS-97-59, April 1997.

⁹⁴ Selection criteria included whether Head Start participation had occurred in 1976 or later; whether studies compared outcomes for participants with those for children not attending any preschool or another preschool; whether studies compared Head Start outcomes with test norms; and, whether studies used tests of statistical significance. *Ibid.*, 10, 24-26.

⁹⁵ *Ibid.*, 8.

⁹⁶ Reproduced in *ibid.*, 48.

⁹⁷ The synthesis study is McKey *et al.*, conducted under contract for the Department of Health and Human Services. Ruth McKey *et al.*, "The Impact of Head Start on Children, Families, and Communities," U.S. Department of Health and Human Services, HHS 85-31193, June 1985.

⁹⁸ *Ibid.*, 1.

⁹⁹ *Ibid.*, 8, III-11.

¹⁰⁰ *Ibid.*, 12-13

¹⁰¹ Nicholas Zill *et al.*, "Head Start FACES 2000: A Whole-Child Perspective on Program Performance," U.S. Department of Health and Human Services, HHS-105-96-1912, May 2003.

¹⁰² Laura Henderson, Kathleen Basile, and Gary Henry, "Prekindergarten Longitudinal Study 1997-1998 School Year Annual Report," Georgia State University Applied Research Center School of Policy Studies, April 1999: 39.

¹⁰³ Linda Schrenko, cited in James Salzer, "School Readiness the Same for Tots; Results Unchanged Despite Pre-K," *Florida Times-Union*, November 1, 1999.

¹⁰⁴ Gary T. Henry *et al.*, "Georgia Pre-K Longitudinal Study: Final Report 1996-2001," Andrew Young School of Policy Studies, Georgia State University, May 2003: 42, available at [aysps.gsu.edu/publications/GPKLSFinal ReportMay2003.pdf](http://aysps.gsu.edu/publications/GPKLSFinal%20ReportMay2003.pdf) (accessed January 18, 2005).

¹⁰⁵ *Ibid.*, 42; and Linda C. Schrenko, State School Superintendent, "Superintendent Schrenko Releases State NAEP Mathematics and Stanford 9 Scores," press release, August 2, 2001, available at www.doe.k12.ga.us/documents/curriculum/testing/scores_tanford_01.pdf (accessed January 18, 2005).

¹⁰⁶ "Pre-K Report: Local Flexibility Works," Andrew Young School of Policy Studies news release, May 19, 2003, available at aysps.gsu.edu/news/releaseprekreport.htm (accessed January 18, 2005).

¹⁰⁷ Ibid.

¹⁰⁸ Gary Henry, cited in *ibid.*

¹⁰⁹ Duane D. Stanford, "Pre-k's true story," *Atlanta Journal-Constitution*, February 23, 2000.

¹¹⁰ Michael Kelley, Joseph Tobin, and Karen Ortiz, "The Condition of Early Childhood Education and Care in Arizona: 2004," Arizona State University Education Policy Studies Laboratory, May 28, 2004: executive summary and 2.20.

¹¹¹ *Ibid.*, 2.15-2.16

¹¹² *Ibid.*, 2.15, 2.18.

¹¹³ For instance, see Coulson, *Market Education*; and Milton Friedman, "Public Schools: Make Them Private," Cato Institute *Briefing Paper* no. 23, June 23, 1995, available at www.cato.org/pubs/briefs/bp-023.html (accessed January 18, 2005).

¹¹⁴ The diversity of programs and multiplicity of funding streams makes it difficult to quantify total expenditures. We believe the best available estimates are documented in Kelley, Tobin, and Ortiz, "The Condition of Early Childhood Education and Care in Arizona: 2004": 2.12. Kelly, Tobin, and Ortiz report \$12 million for Early Head Start; \$87 million for Head Start (excluding tribal and migrant worker programs); \$19.5 million for the Early Childhood Block Grant; \$9.95 million from block grant funds for preschool; \$148.7 million in childcare subsidies; \$134.2 million on kindergarten (excluding multiple funding streams utilized by school districts); and \$171,335 for kith-and-kin programs—for a total of \$411.5 million.

¹¹⁵ *Ibid.*, 2.12.

¹¹⁶ To derive this estimate, we divided the estimated \$134 million spent by the state on kindergarten by the number of kindergartners in public and charter school kindergartens 68,748. See *Ibid.*, 2.10, 2.12.

¹¹⁷ An estimated 42 percent of families with children through age five have incomes equal to or below 185 percent of the federal poverty line. For this calculation, we assumed 42 percent of kindergartners would qualify for the grant (28,874 children). See Charles Bruner *et al.*, "Early Learning Left Out: An Examination of Public Investments in Education and Development by Child Age," *Voices for America's Children and the Child and Family Policy Center*, February 2004: 24, available at <http://www.voicesforamericaschildren.org/Content/ContentGroups/Publications/Voices/ECE1/ELLO/ELLO.pdf> (accessed January 18, 2005).

¹¹⁸ The \$265 million includes \$87 million for Head Start, \$19.5 million from the Early Childhood Block Grant, \$9.95 million from block grants used for pre-school and \$148.7 in child care subsidies. We exclude Early Head Start money, which is normally directed at much younger children. There are an estimated 76,560 four-year-olds in Arizona. See Kelley, Tobin and Ortiz, "The Condition of Early Childhood Education and Care in Arizona: 2004," 2.7, 2.12.

¹¹⁹ An estimated 42 percent of families with children through age five have incomes equal to or below 185 percent of the federal poverty line. For this calculation, we assume 42 percent of four-year-olds would qualify for the grant (32,155 children). See Bruner *et al.*, "Early Learning Left Out," 24.

¹²⁰ Vicki Murray and Ross Groen, "Survey of Arizona Private Schools: Tuition, Testing, and Curricula," *Goldwater Institute Policy Report* no. 199 (January 5, 2005), available at www.goldwaterinstitute.org/article.php/506.html (accessed January 18, 2005).

¹²¹ U.S. Department of Education, *Digest of Education Statistics, 2002*, U.S. Department of Education, Table 61.

¹²² Arizona School Readiness Task Force, "Growing Arizona," Children's Action Alliance, July 2002.

¹²³ National Institute for Early Education Research, "Cost of Providing Quality Preschool Education to America's three- and four-year-olds," Fast Facts, available at nieer.org/resources/facts/index.php?FastFactID=5 (accessed January 18, 2005).

¹²⁴ Le Templar, "All-day kindergarten touted."

¹²⁵ S. V. Date, "Lawmakers urge vouchers for pre-k: They say vouchers are key to universal early education," *Palm Beach Post*, March 22, 2004.

¹²⁶ Brent Kallestad, "Governor Bush signs pre-k bill," *Associated Press*, January 3, 2005.

¹²⁷ Alex Penelas, cited in S. V. Date, "Lawmakers urge vouchers for pre-K."

¹²⁸ Linda Carlton, cited in Mary Ellen Klas, "Pre-K Vouchers Program Provokes Dispute," *Miami Herald*, April 5, 2004, available at <http://www.floridians.org/newsf/04/040504.html> (accessed January 18, 2005).

¹²⁹ "More Money to Rescue Playgroups," *BBC News*, March 29, 2000.

¹³⁰ *Ibid.* See also "Playgroup Places Continue to Fall," *BBC News*, October 1, 1999; and "Call for Shake-up in Preschool Admissions," *BBC News*, October 15, 1999.

¹³¹ Janet Napolitano, Remarks to Supporters of the National Task Force on Public Education.

¹³² To learn more about the U.S. experience with school choice, we recommend the research summary available at <http://www.friedmanfoundation.org/schoolchoiceworks/schoolchoiceresearch.html> (accessed January 18, 2005). See also www.friedmanfoundation.org/schoolchoice/index.html (accessed January 18, 2005).

¹³³ Rathburn, West, and Germino-Hausken, "From Kindergarten Through Third Grade," 33.

¹³⁴ Henderson, Basile, and Henry, "Prekindergarten Longitudinal Study 1997-1998 School Year Annual Report," 39.

¹³⁵ McKey *et al.*, 8, III-11. ■