

Social Policy Report

Giving Child and Youth Development Knowledge Away

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Do You Believe In Magic?: What We Can Expect From Early Childhood Intervention Programs

Jeanne Brooks-Gunn

Summary

Portions of this paper were presented at a research briefing, sponsored by the Subcommittee on Human Resources of the U.S. House of Representatives Committee on Ways and Means. Results are presented from evaluations of several early intervention programs, all of which provided high quality, center-based early childhood education and family-oriented services. Three perspectives are brought to the topic: (1) the developmental outcomes of children who have been identified as being vulnerable due to environmental circumstances; (2) the processes underlying the links between circumstances such as parental poverty and low education and child well-being; and (3) the efficacy of early childhood intervention programs for altering vulnerable children's success in school and beyond. The first perspective deals with the ways in which children develop that enable them to enter kindergarten with the competencies necessary to do well in school. The second considers the mechanisms that tie environmental conditions such as poverty and low parental education to child well-being. The third stresses the potential for early childhood education programs to alter school trajectories of vulnerable children. Concluding points are summarized for which there is consensus, by developmental researchers and policy experts, given the state of the evidence on the evaluation of early intervention programs. First, high quality center-based programs enhance vulnerable children's school-related achievement and behavior. Second, these effects are strongest for poor children and for children whose parents have little education. Third, these positive benefits continue into the late elementary school and high school years, although effects are smaller than they were at the beginning of elementary school. Fourth, programs that are continued into elementary school and that offer high 'doses' of early intervention have the most sustained long-term effects. It is unrealistic, given our knowledge of development, to expect short-term early interventions to last indefinitely, especially if children end up attending poor quality schools. It is magical thinking to expect that if we intervene in the early years, no further help will be needed by children in the elementary school years and beyond.

Social Policy Report

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From the Editor

In this issue of the *Social Policy Report*, we present a policy research brief that Dr. Jeanne Brooks-Gunn delivered to Congress on early intervention. I publish it in *SPR* for two reasons. First, it is an excellent summary of the field and makes the important point that there are no inexpensive, short, and simple responses to the problems of familial poverty and parental low education. Too often policy-makers seek magic bullets because that would be quick and cheap. But there are no easy solutions. Early intervention is often pursued with the belief that we can do something at this point so that no further help will be needed later on. Of course, we know that to be false, but this research brief eloquently makes this case for members of Congress. The second reason I publish the policy research brief is that it presents a message that may be difficult to hear: In order to enhance children's well-being, interventions need to be intensive, integrated, high quality, and continuing. In other words, they are not inexpensive.

A research brief is one form of communication with policymakers, like testimony. Several years ago, SRCD's now Committee on Policy and Communications published a Guide to Congressional Testimony, edited by Kathleen McCartney and Deborah Phillips. Preparing research briefs and testifying before Congress are important ways that we can serve our field. However, one must know how to prepare testimony that is understandable, objective, and convincing. The former guide published by the Committee offers much useful information and this publication of *SPR* provides an outstanding example of such work.

We are also fortunate to have commentary by leaders in the fields of psychiatry, economics, and psychology; Robert Emde, Janet Currie, and Edward Zigler. Because briefs and testimony have to be succinct and hence "brief," these three statements round out the coverage represented in this article, presenting important relevant information. The Zigler piece, for example, reviews the federal history surrounding Head Start.

The pendulum swings back and forth with respect to the importance on early versus later development. In recent years, the focus has been on the former, in part because of the compelling nature of research on brain development and experience. But early intervention is also attractive because it is mistakenly often viewed to be all we need to do. We know that interventions will differ depending on the developmental needs of the child. We need as a society to make a commitment to promoting the well-being of children and youth at all points in development.

Lonnie Sherrod, Ph.D., Editor

Fordham University

Do You Believe In Magic? What We Can Expect From Early Childhood Intervention Programs

**Jeanne Brooks-Gunn, Ph.D.
Teachers College, Columbia University**

It is a pleasure to participate in this research briefing on “Early Childhood Intervention Programs: Are the Costs Justified?,” sponsored by the Subcommittee on Human Resources of the U.S. House of Representatives Committee on Ways and Means and the Joint Center for Poverty Research. My goal is to provide a context in which to interpret the results from the evaluations of several early intervention programs, all of which provided high quality, center-based early childhood education (and family-oriented services). The title “Do You Believe in Magic?” is taken from a popular song from the 1960’s (performed by the Lovin’ Spoonful). The large effects seen at the end of early education are not due to magic; they are based on what is known about young children’s development, and the conditions and circumstances that promote or impede it. The ingredients of high quality early education are not magic, either, and may be repeated across centers, settings, populations, and regions of the country. To expect effects to be sustained throughout childhood and adolescence, at their initial high levels, in the absence of continued high quality schooling, however, is to believe in magic. Indeed, the fact that effects are sustained, albeit at more modest levels, through adolescence in some cases, highlights the potential power of such initiatives.

Background

As a developmental psychologist, I bring three perspectives to this topic. These three are: (1) the developmental outcomes of children who have been identified as being vulnerable due to environmental circumstances; (2) the processes underlying the links between circumstances such as poverty and low maternal education and child competencies; and (3) the efficacy of early childhood intervention programs for altering vulnerable children’s success in school and beyond. All three are long-standing concerns of my policy research on children and families.

The first has to do with the ways in which children develop that enable them to enter kindergarten with the competencies necessary to do well in school. A particular

focus is on children who, on a probabilistic basis, are less likely to arrive at the school door with the requisite skills; these include children who are vulnerable due to biological and environmental conditions (Brooks-Gunn, 1995; Werner, 1995). Environmentally vulnerable children would include those whose families are poor or near-poor, whose parents have not completed high school (and perhaps today, parents who have gotten a GED or high school degree but have not received further training or education), and whose parents are teenagers (which increases the likelihood of low education and poverty tremendously; Brooks-Gunn & Duncan, 1997; Duncan & Brooks-Gunn, 1997; Haveman & Wolfe, 1995). Environmental factors outside of the family also increase the likelihood of school problems; these include, but are not limited to, neighborhood poverty, exposure to toxins, resources available in the community, ease of access to services, and community-level cohesion and norms about children’s behavior (Brooks-Gunn et al., 1997; Goldman, 1995; Leventhal & Brooks-Gunn, 2000; Lewit & Baker, 1995; Kohen et al., 2002; Sampson, et al., 1997).

The second topic has to do with the processes that underlie the links between environmental conditions and child competencies. Family-level processes are often the focus. How does poverty, low education, or low socioeconomic status (SES) more generally, actually influence children? Developmental psychologists consider, for example, interactions between parent and child to be central to the development of many competencies (Bornstein, 1995; Collins et al., 2000; Maccoby & Martin, 1983). Are individual variations in dimensions such as harshness, sensitivity, or the provision of learning experiences accounting, in part, for links between poverty and young children’s well-being? Does maternal emotional distress or access to social support account, in part, for these links? Several research groups, including my own, have been addressing these questions for young children (Bradley, 1995; Bradley et al., 1989; Jackson et al., 2001; Klebanov et al. 1999; Mayer, 1997; McLoyd, 1998).

The third topic has to do with the efficacy of family- and child-oriented programs to alter the outcomes of vulnerable children. Programs have varied in the location of the service (home, center, parenting group), the target (the child, the mother, the dyad, the family, or a combination), the timing (beginning prenatally, in infancy, in preschool), the intensity (full day programs to weekly or monthly home visits), the extensivity (1 to 5 years of intervention), as well as the curriculum (skills-based education, parent-child

interaction training, literacy skills, parental coping skills, provision of social support; Brooks-Gunn, et al., 2000; Gomby, 1999; Shonkoff & Meisels, 2000). My personal experience in this arena began with the Educational Testing Service Head Start Longitudinal Study, conducted in the late 1960s and early 1970s, to evaluate the efficacy of Head Start in four communities and multiple centers. We found positive effects in the early years of school (Lee, Brooks-Gunn, & Schnur, 1988; Lee, Brooks-Gunn, Schnur, & Liaw, 1990), as did others (McKey et al., 1985). Of particular interest were the positive effects on inhibitory control, as well as on more often-studied verbal and early reading skills. I am one of the principal investigators of the Infant Health and Development Program (IHDP), at present the largest multi-site randomized trial testing the efficacy of early childhood intervention upon children's well-being, in which the same intervention was implemented across the country (8 sites). These children (all of whom were low birth weight and premature; Gross, Spiker, & Hayes, 1997; Infant Health and Development Program, 1990). The children in the intervention group received services from birth through age 3 and have been followed through age 8 (Brooks-Gunn et al., 1994; McCarton et al., 1997). Finally, I am one of the investigators in the Early Head Start National Research and Evaluation Project, a 17-site randomized evaluation which is in the field (Love et al., 2002).

Young Children's Development and SES

Issues addressed in this briefing include the following:

- (1) What are the competencies of preschoolers that are associated with success in elementary school?;
- (2) What is known about the impact of environmental conditions in the first 4 years of life upon children's well-being, both in elementary school and later in life?;
- (3) What are the family processes that underlie links between poverty and children's well-being?;
- (4) What is the state of the knowledge about the efficacy of early childhood intervention programs, and for whom and under what conditions are programs effective?;
- (5) What long-term effects are realistic to expect from early childhood programs?

Competencies in Early Childhood

Much has been written about school readiness and child well-being. Lists of competencies have been generated by many scholars. Areas of competency include: physical well-being and motor development, social and emotional

development, approaches toward learning, language usage, and cognition and general knowledge (Kagan, 1992; Love et al., 1994). Focusing on the developmental tasks of childhood would generate a different, yet overlapping, list of competencies to be acquired. These have been labeled: cognitive growth and learning, self-regulation, trusting and loving relationships with parents, cooperation with and empathy toward peers, and physical health (Moore et al., 2001; Fuligni & Brooks-Gunn, 2001).

How well do these competencies jibe with what is expected in school? Kindergarten teachers have also been asked to report on what competencies are important. Lewit and Baker (1994) compared the responses from three different studies of kindergarten teachers and families to estimate rates of school readiness. In one, teachers rated the most important characteristics of school readiness as physical health, communication skills, enthusiasm, taking turns, and the ability to sit and pay attention. In another, 7,000 kindergarten teachers estimated that only 65% of their students in the fall of 1990 were ready for school. If as many as one-third of kindergartners may not be considered by their teachers to be ready for school, the proportions may be much higher in poor communities.

Teachers' perceptions of children's abilities are associated with youngsters' successes. This is true, vis-à-vis reading and math achievement, even controlling for actual pre-reading and math scores (Alexander & Entwisle, 1988). We suspect that teachers are basing their perceptions of ability on a combination of those characteristics that they mention in more descriptive work. That is, kindergarten teachers are concerned with children's emotional regulation and impulse control in the classroom (taking turns, ability to sit and pay attention), just as much as they are with children's ability to count and to associate letters with sounds. If any of you doubt the importance of emotional competencies, please spend one-half of a day in a public school kindergarten class.

Poverty in Early Childhood

Our research on the impact of low income on children is summarized in several places (Brooks-Gunn & Duncan, 1997; Duncan & Brooks-Gunn, 1997; 2000). Several points are highlighted here. First, income is associated with children's cognitive development, achievement, and behavior during the preschool period. We find associations beginning at around 2 years of age and continuing through age 8 (using the Infant Health and Development Program with IQ data

What We Can Expect From Early Childhood Intervention Programs

Janet Currie, UCLA

In her testimony, Jeanne Brooks-Gunn raised several issues that are worth further exploration. First, could intervention improve future outcomes, even if it had no impact on cognitive test scores? Second, what is the evidence that large-scale public programs like Head Start (rather than small-scale, model programs) can achieve gains? And third, what is the evidence regarding longer-term effects of early intervention?

It is natural for developmental psychologists to consider the effects of intervention on outcomes such as inhibitory control and other aspects of self-regulation. But much of the literature evaluating early intervention focuses on cognitive test scores to the virtual exclusion of other measures. There has been much hand-wringing over the fact that initial gains in cognitive test scores following intervention tend to decline over time (“fade-out”). Yet given how easy it can be to induce gains in such test scores (e.g. by “teaching to the test”), volatility in these scores should not be surprising. An increasing body of literature, for example, by Nobel prize winning economist James Heckman, emphasizes the importance of non-cognitive skills to success. Suppose that it is not possible to make children more “intelligent”; does this mean that early intervention is doomed to failure? Not if early intervention can help children to avoid stigmatizing special education programs, to get along in the classroom, and ultimately to have higher educational attainments.

However, as Brooks-Gunn alludes, there is a great deal of evidence that gains from early intervention in both cognitive and other domains are maintained for long periods of time by many children. It may be as she suggests that a key factor affecting the maintenance of gains is the school environment following the early intervention. Currie and Thomas (2000) show that the children most likely to suffer “fade-out” in test score gains are also most likely to attend the worst quality schools. This result suggests that gains from early intervention can be maintained as long as subsequent schooling is not of the worst quality.

Demonstration programs such as the Infant Health and Development Program have shown that it is possible to improve children’s cognitive and non-cognitive outcomes through early intervention. It is encouraging that evaluations of Head Start have also shown long-lasting gains for many children. For example, Currie and Thomas (1995) compare children who attended Head Start to their own siblings and find show that those who attended Head Start have higher scores on a test of vocabulary, and are less likely to have repeated a grade. Garces, Thomas and Currie (2002) use retrospective data on Head Start attendance in a sample of young adults, and show that, relative to their siblings, adults who attended Head Start have more schooling, and are less likely to have been booked or charged with a crime.

Criticism of early intervention programs can be constructive, to the extent that it pushes researchers to more carefully evaluate claims of effectiveness. It is to be hoped that the next generation of studies will get further inside the “black box” of program design to tell us what features of these programs are key to successful early intervention.

from age 2 to 8, and the National Longitudinal Study of Youth-Child Supplement with verbal receptive vocabulary test data from age 3 onwards and achievement test data collected every other year from age 5 onwards). By age 3, the effects are most pronounced for children who are persistently poor and for those who are experiencing deep poverty (Brooks-Gunn et al., 1993; Duncan et al., 1994; Smith, et al., 1997; Klebanov et al., 1998). Effects are not limited to those below the poverty threshold, however.

Second, these effects on achievement test scores do not diminish during the elementary school years and if anything, increase somewhat. (Zhao & Brooks-Gunn, 2002) We suspect that these findings are indicative of the fact that, in general, elementary school education is not ameliorating academic disparities between children at various points in the social class distribution (Lee, et al., 1996). These findings have implications for the reduction in effect sizes on cognitive test scores for early childhood education programs as children progress through school.

Third, preschool income has an effect on rates of completed schooling, not just early cognitive and achievement test scores during childhood (Duncan, Brooks-Gunn, Yeung, & Smith, 1998). We have found, for example, that income in the early years of life, but not family income in middle childhood or early adolescent years, is associated with high school completion rates (using a sample from the Panel Study of Income Dynamics). Not surprisingly, for years of completed schooling beyond high school, family income in the early adolescent years also matters (since college attendance is not free).

Fourth, a common criticism of the literature linking poverty and child well-being is the possibility of selection bias. That is, families who have more income may differ in unmeasured ways from families who have less income; if these differences are not controlled, then any demonstrated income effects may be spurious (Mayer, 1997). We have addressed this measurement problem by estimating the effects of income upon children within the same families (since, for example, a family might have been poor when one child was 3, but not when another child in the same family was 3). We still find income effects on elementary school achievement and on high school completion when using these sibling techniques (Duncan et al., 1998).

Fifth, why should early income matter? We hypothesize that, since low income in the early years of life is associated with less adequate preschool competencies, children are set on a trajectory for lowered school achievement that is

difficult (although probably not impossible) to alter. The work of Entwisle and colleagues supports this premise. Coupled with the fact that the SES disparities are not diminished in elementary school, in part due to the quality of schooling that poor children receive, an uptick in poor children's trajectories is unlikely (Lee et al., 1996). The few analyses testing this assumption report that trajectory changes are possible, though, when parental income increases for poor families on welfare (Furstenberg, Brooks-Gunn, & Morgan, 1987; Smith, Brooks-Gunn, Kohen, & McCarton, 2001).

Family Processes as Links between Poverty and Outcomes

Family processes are considered a potential pathway through which income affects children. Family processes operate via the home environment and parent-child interactions. Warmth and harshness of mother-child interactions, the physical condition of the home, and opportunities for learning account for a substantial portion of the effects of family income on cognitive outcomes in young children (Klebanov et al., 1998; Linver et al., 2002; Yeung et al., 2002).

Some studies (but not all) have established that parent mental health also accounts for a portion of the effect of economic circumstances on young children's health and behavior. Additionally, poor parental mental health is associated with impaired parent-child interactions and fewer learning experiences in the home (Bornstein, 1995; Bradley, 1995).

Since about one-half of the effect of family income on tests of cognitive ability is mediated by (operates through) the home environment, early childhood interventions often profit by focusing on parenting (Brooks-Gunn et al., 2000). However, the research is mixed as to what types of programs are most likely to enhance parenting behavior (Gomby, Culross et al., 1999, 1994; Olds et al., 1999; Ramey & Ramey, 1998).

Efficacy of Early Childhood Intervention Programs

One of the goals of early childhood intervention programs is to diminish the SES disparities in the preschool years so that poor children enter school on a more equal footing to their more affluent peers. This section summarizes agreements and disagreements as to the interpretation of the current literature, among scholars.

Agreement among policy scholars. General agreement among policy scholars exists on some facts but not others related to early intervention. Table 1, adapted from Karoly et al. (1998), provides a summary for well-designed, well-executed, and high quality early intervention programs. Efficacy of these programs is clearly demonstrated. Consensus is usually reached with regard to a number of points, including the following three (Currie & Thomas, 2000; Fuligni & Brooks-Gunn, 2001):

First, early intervention programs have the potential to alter poor children's achievement in elementary school. Well-designed randomized evaluations have reported such effects since the 1970s.

Second, almost all of the programs reported positive results on childhood outcomes have involved center-based early childhood intervention (Barnett, 1995; Brooks-Gunn, 1995; Karoly et al., 1998). In contrast, most home visiting programs do not find much in the way of child achievement effects (although there are a few exceptions which seem to be related to the intensity of home visiting services as well as to the curriculum; see Gomby, et al., 1999). Programs that offer case management (rather than home visits focusing on parenting skills) to poor families with young children have reported disappointing results, on the whole (St. Pierre et al., 1995). We do not know if any combinations of these intervention strategies are particularly effective. However, at present, center-based programs are the ones with the most consistent effects on children.

Third, the effect sizes seen in the preschool years diminish over the school years. For example, in the Infant Health and Development Program (IHDP), the magnitude of intervention effects on cognitive test scores decreased over time (see Table 2). At age 3, heavier low birthweight children in the intervention group had cognitive test scores that were, on average, 14 points higher than the scores of children in the control group. At 8 years of age, the difference between the intervention and control group, although still significant, was smaller (intervention group children scored 4 point higher than control group children). Similarly, intervention effects on receptive vocabulary scores diminished between the age 3 and age 8 assessments. Heavier low birthweight children in the intervention group scored 9 points higher at the age 3 assessment and 6 points higher at the age 8 assessment than children in the control group. Once again, the magnitude of intervention effects remained statistically significant over time. Intervention effects on reading

comprehension, as measured by the Woodcock-Johnson, also diminished over time in the Abecedarian Project.

Fourth, effects are largest for children who would have been in mother-only care, relative care, or family child care if the IHDP early childhood intervention had not been offered (Hill, Waldfogel, & Brooks-Gunn, 2002). Effects were smaller for those children who would have been in center-based care if the IHDP early childhood intervention had not been offered, again suggesting the power of early programs.

Fifth, effects of IHDP at age 8 are from 8 to over 10 points for the heavier low birth weight children who received 350 or more days at the child care centers (Hill, Brooks-Gunn, & Waldfogel, in press).

Disagreement among policy scholars. Scholars disagree, however, in their interpretation of the following four issues:

First, what do we make of the fact that the effects of early childhood education on school achievement are greatest at the beginning of elementary school, compared to later on? Some scholars have called the fact that treatment sizes diminish a "fade-out" effect. This term is misleading since the randomized studies that have followed children through elementary school report smaller, but still significant effects, through this period (Lazar et al, 1982; Ramey & Ramey, 1998; Karoly et al., 1998). "Fade-out" implies that children who received early childhood intervention look the same as (randomized control) children who did not receive the intervention. This is not true. In a later section, the issue of whether the effects found later in life are meaningful is discussed.

Second, what do we make of the fact that our evidence base is not representative of the entire population of poor children? Most early childhood programs have been, by design, single-site studies. Clearly, these samples are not representative of the nation's children. However, they were never designed to be representative. Instead, they were conducted to exhibit that such programs can be efficacious. Looking across studies suggests that such interventions may be efficacious for various subgroups or poor children. For example, the Parent Child Development Center (PCDC) programs were efficacious for African-American and for Hispanic children (Andrews et al., 1982). And, in the Infant Health and Development Program (concentrating on those children who weighed at least 2000 grams/4.4 pounds in the eight sites), the program was efficacious for African-American, Hispanic, and white children (Brooks-Gunn et al., 1993). Given the IHDP's design, families from across

Charting Intervention Effects Over Time

Robert Emde, University of Colorado

In this compelling statement, Brooks-Gunn reviews evidence indicating that center based early childhood intervention programs do provide benefits but that to expect such benefits to be an “inoculation” would be wrongheaded. To expect benefits to persist in a disadvantaged or stressed population, without attention to what is needed after early childhood, would be to engage in magical thinking. In this space, I would like to add further pieces of evidence from two randomized control trials (RCTs) that underscore the effectiveness of early intervention and that include home visitation. I will also argue, building on the Brooks-Gunn testimony, for the urgent importance of longitudinal follow up for early interventions.

Results of the RCT involving 17 sites selected from the new national programs of Early Head Start are now available. A research consortium carrying out this study has included investigators from 16 universities (including this author and Brooks-Gunn) as well as collaborators from Mathematica Policy Research and the Administration for Children and Families of DHHS. Some 3000 families were enrolled in this study and significant positive impacts from Early Head Start programs were found in cognitive, language and socio-emotional development observed at both two and three years of age. There were also positive impacts at these ages in parenting—based on observations of parent-child interactions and on parental self report. Impacts were stronger in programs independently evaluated as more fully implementing Head Start’s performance standards and in those that had home visiting as well as center components (what were called “mixed-approach” programs). Although impacts occurred across domains and demographic groups, effect sizes were modest (c. 10-20%), with impacts larger in some of the subgroup analyses (e.g. 50%). The need for longitudinal study is clear. The children of this study are now being evaluated at five years of age prior to kindergarten entry, and assessment after school entry would be valuable since impacting readiness to learn and socio-emotional regulation that contribute to school readiness are goals of this early intervention. (Love et al., 2002)

As implied in the Brooks-Gunn testimony, longitudinal study after early intervention is important for understanding what continues to work and what is needed in later development in order to maintain and enhance early gains. And there is another reason for longitudinal study that is emerging from research. This has to do with the clear suggestion of favorable long term impacts on conduct. As reviewed, both the Perry Preschool Program and the Abecedarian Project found reductions in school dropout and in teenage parenting rates and the former program, in a follow up into young adulthood, found a reduction in juvenile delinquency and crime. The results of another longitudinal study, involving a 15 year follow up after a carefully done randomized control trial are even more revealing. The early intervention consisted of a program of nurse home visitation that took place during pregnancy and the child’s first two postnatal years (Olds et al., 1999). In addition to the long term impacts on their mothers (lesser welfare dependency, child maltreatment, criminality and use of adverse substances) there were conduct effects on the children who were now adolescents. The children who had been born to unmarried mothers in low SES households had fewer incidents of running away, fewer arrests, fewer convictions, fewer sex partners and a lesser use of cigarettes and alcohol; in addition, parents reported these children had fewer behavioral problems.

The social policy import is striking. Longitudinal study is crucial, not only to document what is needed to sustain early intervention effects, but also to appreciate possible influences on later aspects of child development. Pervasive effects may occur beyond cognitive or learning enhancement. Even when cognitive enhancements may seem to disappear, positive effects may occur in the domains of antisocial behavior. It is instructive that when Head Start began it was primarily concerned with enhancing cognitive competence and, over time, enhancing social competence became appreciated as being equally important. Early Head Start has now added goals of enhancing relationship building and socio-emotional regulation, and some of us have seen this intervention as also contributing to positive early moral development and conduct regulation. Will follow up reveal what leads to positive influences on conduct?

Our prisons are competing with our schools for public dollars and teachers complain about spending too much time maintaining classroom order as opposed to teaching. As the testimony reviews, kindergarten teachers are as much concerned with children’s conduct (e.g. the ability to regulate emotions, pay attention and take turns) as they are with abilities to associate letters with sounds and count. As Brooks-Gunn shows us, there is no magic from early intervention and we need to know more about what helps beyond the initial intervention years. I would add this point of emphasis. Longitudinal study is key. What could be more important for social policy than understanding more about the conditions under which early intervention leads to improvements in conduct?

the SES spectrum were included; the program was most efficacious for those children whose mothers had a high school education or less and those children whose mothers had incomes of 200% or less of the poverty threshold (Liaw & Brooks-Gunn, 1993; Brooks-Gunn et al., 1992).

Such results should lessen concerns about the earlier studies focusing primarily on poor African-American children. The Infant Health and Development Program results suggest that efficacy is most likely for children who are poor or near poor and/or have mothers with a high school education or less. At the same time, within samples of poor mothers, efficacy has been demonstrated across ethnic groups, for married and single mothers, and for working and non-working mothers (Love et al., 2002).

Third, what about the fact that sample sizes are small or interventions are limited to one site? The initial studies were designed and implemented by individual teams of investigators, not as part of national evaluations. Funding constraints always limit sample size. The Abecedarian Project and the Perry Preschool Program include about 100 children each. However, the Parent Child Development Center studies were initiated in three sites, with short-term effect sizes similar to those seen in the two single-site studies just mentioned (Benasich et al., 1992). And, the Infant Health and Development Program was conducted in eight sites nationwide, similar results to those of the Abecedarian Project were found when the heavier babies were age 5 and 8 (Brooks-Gunn et al., 1994; McCarton et al., 1997).

Fourth, what about the relative paucity of studies that have followed the children into adolescence and adulthood? While more follow-up studies are always welcome, I am willing to accept the current findings as relevant. If some of the current experiments are able to trace their children through adolescence, then our database will be stronger. If not all treatment programs or subgroups within a program exhibit sustained effects, then these findings will inform yet another generation of preschool programs as to their design and implementation. As an example, the long-term results from the Perry Preschool Program and the Abecedarian Project are not identical. Both find reductions in school dropout and in teenage parenting rates (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, in press; Karoly et al., 1998). However, the Abecedarian Project also reports continued effects on school achievement while the Perry Preschool Program does not. The Perry Preschool Program reports reductions in juvenile delinquency and crime while the Abecedarian Project does not. These variations could

be due to sample differences, to treatment differences (nature of curriculum, timing of program initiation, length of program), or to differences in the schools and neighborhoods in which these children lived. The fact remains, however, that both are finding sustained effects into young adulthood.

What Long Term Effects are Realistic to Expect?

How large do effects of early intervention need to be? Some policy scholars suggest that the sizes of the effects in middle childhood are not large enough. What is the standard? Is a decrease in special education placement or grade repetition of 50% large enough (Lazar & Darlington, 1982)? Is a sustained effect of the intervention of about 4 to 6 points on a standardized achievement test or a cognitive test large enough (Ramey & Ramey, 1998)?

Early intervention programs have short-term effects, ones that are larger than what we have seen in other arenas of human services research. We have had more success in early childhood than at later points in the life course. Somewhat surprisingly, we have much less experimental work systematically varying an aspect of the elementary or high school (Mosteller, 1995).

If policy makers believe that offering early childhood intervention for two years will permanently and totally reduce SES disparities in children's achievement, they may be engaging in magical thinking. To paraphrase Edward Zigler, there is no quick fix, either in education or anyplace else. After an early childhood intervention program ends, poor children are very likely to go to schools that are not conducive to learning. They are likely to live in neighborhoods with relatively few resources. Their neighborhoods are relatively more likely to have high levels of toxins, including lead, violence, asthma-inducing pathogens, and unsafe play areas. Their parents are more likely to experience discrimination in housing and jobs as well as have transportation difficulties. Given these often co-occurring conditions, the fact that effects continue (although they are smaller than those seen at the end of the program itself) through elementary school (which all would agree) and even through adolescence is, in my opinion, impressive. And the continuing effects into young adulthood even more so (even taking into account the thin data base).

Forty Years of Believing In Magic Is Enough

Edward Zigler, Yale University

Magic beliefs sprouted alongside Head Start and its precursors. Magic was in the air in 1965 when President Lyndon Johnson told the nation that the young children who attended a new summer school program called Head Start were going to grow up to be taxpaying and productive citizens instead of welfare dependents and prison inmates. Prominent behavioral scientists like J. McVicker Hunt and Benjamin Bloom were telling an eager public that small changes in a child's rearing environment early in life were a magic wand that would add dozens of IQ points. These were the times characterized by what Sandra Scarr called "naïve environmentalism" and which Zigler dubbed the "environmental mystique." Rampant optimism led many to believe that a brief period of intervention—like spending half-days in Head Start for 6 or 8 weeks—would inoculate a child against the past and future devastating effects of growing up in poverty.

In their defense, the founders of Head Start and most of the experimental early childhood programs being developed at the time were not aiming to create a nation of geniuses. Head Start's planners, for example, were charged with the more serviceable mission of helping young children who lived in poverty begin school on an equal footing with peers from wealthier homes. This relatively modest intent became obscured by the hoopla over claims of IQ enhancers and poverty busters. It was not until the 1998 Reauthorization of Head Start that Congress made school readiness the program's official goal. This move has yet to quell the flow of overpromises and high hopes that continue to plague efforts to alleviate the risks faced by children growing up in poverty.

Jeanne Brooks-Gunn asks us to ponder whether the goal of school readiness is good enough, i.e., whether it is meaningful enough to justify the cost of attaining it. Of course, a reasonable expectation emanating from considerable evidence is that if children are better prepared for school on their first day, they will be more successful in school and perhaps beyond. The evidence reviewed by Brooks-Gunn indicates that this is, indeed, the case, but some of the initial advantages weaken over time. The literature, thus, proves what we should have known all along: There is no magical, permanent cure for the problems associated with poverty.

This does not mean that early intervention is not worth doing. The data merely suggest that we become realistic and temper our hopes. Generally speaking, children whose families are poor do not match the academic achievement of children from more advantaged homes. The point of school readiness programs like Head Start and public Pre-Kindergartens is to narrow this gap. Expecting the achievement gap to be eliminated, however, is relying too much on the fairy godmother. Poor children simply have too much of an environmental handicap to be competitive with age-mates from homes characterized by good incomes and a multitude of advantages.

Reducing the achievement gap is possible, but here, too, there is no quick fix. The path to school readiness begins before birth with good prenatal care and maternal practices. Caregivers are central to the acquisition of all that the child requires to prepare for school: good physical and mental health and sound cognitive, social, and emotional development. The acclaimed report, *Neurons to Neighborhoods*, also emphasizes that parent-child interactions are the key to acquiring most competencies. Intervention must, therefore, begin early and enlist parents as the child's first and most influential teachers. At school-age, we cannot just dump the child at the schoolhouse door. We must assure that continuing developmental needs are met and that parents participate in the child's education so they can support educational goals at home.

We detailed such a system of extended intervention (prenatal–Age 8) in our book, *Head Start and Beyond*. Models already exist for each element of the three-stage system we envisage (and funding could be bolstered by folding the massive Title I of the ESEA into the effort). For the years prenatal–3, when many developmental milestones are accomplished and parents are the major source of socialization, the relatively new Early Head Start program is already showing positive results. Quality, comprehensive preschool services can be delivered through the time-tested Head Start model. Children in the early elementary school years can be served by programs like the Chicago Child-Parent Centers and the Head Start Transition Project. (Although study of the latter showed transition children to have school adjustment comparable to the control group, the controls also experienced strong transition services and, in a rare finding, both groups achieved national norms.)

Will high quality, comprehensive, two-generation services spanning the years prenatal–8 help narrow the achievement gap? The evidence so well reviewed in this *Social Policy Report* suggests yes. Will it be worth it? Absolutely, if our nation is truly committed to School Reform and its goal Number 1, school readiness. Are we sure there is no magic potion that will push poor children into the ranks of the middle class? Only if the potion contains health care, child care, good housing, sufficient income for every family, child rearing environments free of drugs and violence, support for all parents in their roles, and equal education for all students in all schools. Without these necessities, only magic will make that happen.

Conclusion

Early intervention programs may prove, in the decades to come, even more efficacious than those initiated in the 1960's to 1990's. As more and more mothers enter the work force, full-time early intervention programs will be critical to the success of both mothers and young children. This is especially true for families in the bottom two quartiles of the income distribution, a large proportion of whom are single mothers. Over the past 10 years, the proportion of single, never-married mothers with children under age 6 in the labor force has soared and now surpasses the rate of married mothers with children under age 6—increasing from less than 50% in 1990 to 67% in 1998 (U.S. Census Bureau, 1999).

As evaluations of programs serving families in the 2000s become available (Brooks-Gunn et al., 2000), what will we consider evidence of cost effectiveness? If a cost analysis suggests that an early childhood program breaks even (and even if it does not break even), but reduces the high school dropout rate by one-third, would we want to fund it? If an early childhood program promotes stable maternal work (and presumably somewhat higher family incomes, fewer days of missed work, and/or more stable employment), will we add this into our cost estimates of future early childhood intervention evaluations?

One other cost consideration merits attention. Early childhood intervention services are more expensive for younger than older preschoolers. The staff:child ratios are much smaller for infants than preschoolers. Consequently, costs need to be estimated separately for infants (birth to 18 months), toddlers (18 to 36 months), and preschoolers. And, from an early childhood policy perspective, we need to ask whether the efficacy of intervention is dependent on the age of the child at program entry. The Abecedarian Project offered full-time child-care beginning in the 1st year of life, the Infant Health and Development Program in the 2nd year of life, and the Perry Preschool Program in the 3rd or 4th year of life. Does the timing of entry make any difference, vis-à-vis effects in elementary school and beyond? And does it matter how long the intervention lasts? The Abecedarian Project lasted 5 years, the Perry Preschool Program one or 2 years, and the Infant Health and Development Program 2 years (for the child care component).

If early childhood interventions were equally effective whether they were started when the child was 6 or 18 or

24 months of age, then policy might favor serving toddlers rather than infants. Such a decision would have vast cost implications (leaving aside current policy of requiring mothers with infants to enter to work force, which is a different issue but one with implications for child care more generally). If the Universal Pre-Kindergarten movement (or the more targeted Pre-K approach, which would offer slots to poor children first) gains in popularity in our cities and states, then concerns about providing preschool services to all 4-year-olds would diminish (assuming that all of them were actually served under an Universal Pre-K system), with more attention being placed on the three-year-olds and the two-year-olds. Such a scenario would alter the costs of providing early childhood intervention.

In brief, from a comparative perspective, then, early childhood intervention has larger effects (at the end of the program) than interventions begun later in childhood and adolescence. In addition, the effects of early childhood programs continue through elementary school and, while they are smaller, they are still larger than the immediate effects of other, later interventions. If the sum of the largest effects in the educational literature is not large enough, what do we want?

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References

- Adler, N. E., Boyce, W. T., Chesney, M. A., Folkman, S., & Syme, S. L. (1993). Socioeconomic inequalities in health: No easy solution. *Journal of American Medical Association*, 269, 3140-3145.
- Alexander, K.L., & Entwisle, D.R. (1988). Achievement in the first 2 years of school: Patterns and Process. *Monographs of the Society of Research in Child Development*, 53(2). Chicago: University of Chicago Press.
- Andrews, S.R., Blumenthal, J.B., Johnson, D.L., Kahn, A.J., Ferguson, C.J., et al. (1982). The skills of mothering: A study of Parent Child Development Centers (New Orleans, Birgingham, Houston). *Monographs of the Society for Research in Child Development*, 47 (6, Serial No. 198).
- Barnett, W. S. (1995). Long-term effects of early childhood programs on cognitive and school outcomes. *The Future of Children*, 5, 25-50.
- Benasich, A.A., Brook-Gunn, J., & Clewell, T.C. (1992). How do mother benefit from early intervention programs? *Journal of Applied Developmental Psychology*, 13, 311-362.
- Bornstein, M. H. (Ed.). (1995). *Handbook of parenting*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Bradley, R.H. (1995). Home environment and parenting. In M. Bornstein (Ed.), *Handbook of parenting: Vol 2. Biology and ecology of parenting* (pp.235-261). Hillsdale, NJ: Erlbaum.
- Bradley, R.H., Caldwell, B.M., Rock, S.L., Barnard, K.E., Gray, C., et al. (1989). Home environment and cognitive development in the first 3 years of life: A collaborative study involving six sites and three ethnic groups in North America. *Developmental Psychology*, 25(2), 217-235.
- Brooks-Gunn, J.(1995). Strategies for altering the outcomes for poor children and their families. In P. L. Chase-Lansdale & J. Brooks-Gunn (Eds.), *Escape from poverty: What makes a difference for children?* (pp. 87-117). New York, NY: Cambridge University Press.
- Brooks-Gunn, J., Berlin, L. J., & Fuligni, A. S. (2000). Early childhood intervention programs: What about the family? In J. P. Shonkoff & S. J. Meisels (Eds.), *Handbook of early childhood intervention* (2nd ed., pp. 549-588). New York, NY: Cambridge University Press.
- Brooks-Gunn, J., Berlin, L. J., Leventhal, T., & Fuligni, A. (2000). Depending on the kindness of strangers: Current national data initiatives and developmental research. *Child Development*, 71(1), 257-267.
- Brooks-Gunn, J., Gross, R. T., Kraemer, H. C., Spiker, D., & Shapiro, S. (1992). Enhancing the cognitive outcomes of low-birth-weight, premature infants: For whom is the intervention most effective? *Pediatrics*, 89(8), 1209-1215
- Brooks-Gunn, J., Duncan, G. J., & Aber, J. L. (Eds.). (1997). *Neighborhood poverty: Vols. 1 & 2*. New York, NY: Russell Sage Foundation Press.
- Brooks-Gunn, J., Klebanov, P.K., Liaw, F., & Spiker, D. (1993). Enhancing the development of low birth weight, premature infants: Changes in cognition and behavior over the first three years. *Child Development*, 64(3), 736-753.
- Brooks-Gunn, J., McCarton, C., Casey, P., McCormick, M., Bauer, C., et al. (1994). Early intervention in low birth weight, premature infants: Results through age 5 years from the Infant Health and Development Program. *Journal of the American Medical Association*, 272, 1257-1262.
- Campbell, F. A., Ramey, C. T., Pungello, E., Sparling, J., & Miller-Johnson, S. (in press). Early childhood education: Young adult outcomes as a function of differing treatment. *Applied Developmental Science*.
- Collins, W. A., Maccoby, E. E., Steinberg, L., Hetherington, E. M., & Bornstein, M. H. (2000). Contemporary research on parenting: The case of nature and nurture. *American Psychologist*, 55(2), 218-232.
- Currie J. & Thomas, D. (1995). Does Head Start make a difference? *American Economic Review*, 85(3), 341-364.
- Currie J. & Thomas, D. (2000). School quality and the longer-term effects of Head Start. *Journal of Human Resources*, 35(4), 755-774.
- Duncan, G. J., & Brooks-Gunn, J. (1997). Income effects across the life span: Integration and interpretation. In G. J. Duncan & J. Brooks-Gunn (Eds.), *Consequences of growing up poor* (pp. 596-610). New York, NY: Russell Sage Foundation Press.
- Duncan, G.J., & Brooks-Gunn, J. (2000). Family poverty, welfare reform and child development. *Child Development*, 71(1), 188-196.
- Duncan, G. J., Brooks-Gunn, J., & Klebanov, P. K. (1994). Economic deprivation and early childhood development. *Child Development*, 65, 296-318.
- Duncan, G. J., Brooks-Gunn, J., Yeung, W. J., & Smith, J. R. (1998). How much does childhood poverty affect the life chances of children? *American Sociological Review*, 63, 406-423.
- Fuligni, A.S., & Brooks-Gunn, J. (2000). The healthy development of young children: SES disparities, prevention strategies, and policy opportunities. In B.D. Smedley & L. Syme (Eds.), *Promoting health: Intervention strategies from social and behavioral research*. (pp.170-216). Washington, DC: National Academy of Sciences.
- Furstenburg, F. F., Jr., Brooks-Gunn, J., & Morgan, S. P. (1987). *Adolescent mothers in later life*. New York: Cambridge University Press.
- Garces, Thomas D., & Currie, J. (2002). Longer term effects of Head Start. *American Economic Review*.
- Gomby, D. S. (1999). Understanding evaluations of home visitation programs. *The Future of Children*, 9(1), 27-43.
- Gomby, D. S., Culross, P. L., Behrman, R. E. (1999). Home visiting: Recent program evaluations – analysis and recommendations. *The Future of Children*, 9(1), 4-26.
- Gross, R. T., Spiker, D., & Haynes, C. W. (Eds.). (1997). *Helping low birth weight, premature babies: The Infant Health and Development Program*. Stanford, CA: Stanford University Press.
- Haveman, R., & Wolfe, B. (1994). *Succeeding generations: On the effects of investments in children*. New York, NY: Russell Sage Foundation Press.
- Heckman, J. & Rubinstein, Y. (2001). The Importance of non-cognitive skills: Lessons from the GED Testing Program. *American Economic Review*, 91(2), 145-149.
- Hill, J., Brooks-Gunn, J., & Waldfogel, J. (in press). Sustained effects of high participation in an early intervention for low-birth-weight premature infants. *Developmental Psychology*.
- Hill, J.L., Waldfogel, J., & Brooks-Gunn, J. (2002). Differential effects of high-quality child care. *Journal of Policy Analysis & Management*, 21, (4).
- The Infant Health and Development Program Staff. (1990). Enhancing the outcomes of low birth-weight, premature infants: A multisite randomized trial. *Journal of the American Medical Association*, 263(22), 3035-3042.
- Jackson, A., Brooks-Gunn, J., Huang, C., & Glassman, M. (2001). Single mothers in low-wage jobs: Financial strain, parenting, and preschoolers' outcomes. *Child Development*, 71 (5), 1409-1423.

- Kagan, S. L. (1992). Readiness past, present, and future: Shaping the agenda. *Young Children*, 48(1), 48-53.
- Karoly, L.A., Greenwood, P.W., Everingham, S.S., Hoube, J., Kilburn, M.R., Rydell, C.P., Sander, M., & Chiesa, J. (1998). *Investing in our children: What we know and don't know about the cost and benefit of early childhood interventions*. Santa Monica, CA: RAND.
- Klebanov, P. K., Brooks-Gunn, J., McCarton, C., & McCormick, M. C. (1998). The contribution of neighborhood and family income to developmental test scores over the first three years of life. *Child Development*, 69, 1420-1436.
- Klebanov, P.K., Brooks-Gunn, J., & McCormick, M.C. (2001). Maternal coping strategies and emotional distress: Results of an early intervention program for low birth weight young children. *Developmental Psychology*, 37 (5), 654-667.
- Kohen, D., Brooks-Gunn, J., Leventhal, T., & Hertzman, C. (2002) Neighborhood income and physical and social disorder in Canada: Associations with young children's competencies. *Child Development*, 73 (6), 1845-1860.
- Lazar, I., & Darlington, R. B. (1982). Lasting effects of early education: A report from the consortium for longitudinal studies. *Monographs of the Society for Research in Child Development*, 47(2-3, Serial No. 195).
- Lee, V. E., Brooks-Gunn, J., & Schnur, E. (1988). Does Head Start "close the gap?": A comparison of children attending Head Start, no preschool, and other preschool programs. *Developmental Psychology*, 24(2), 210-222.
- Lee, V. E., Brooks-Gunn, J., Schnur, E., & Liaw, F. (1990). Are Head Start effects sustained? A longitudinal follow-up comparison of disadvantaged children attending Head Start, no preschool, and other preschool programs. *Child Development*, 61, 495-507.
- Lee, V. E., Croninger, R. G., Linn, E., & Chen, X. (1996). The culture of sexual harassment in secondary schools. *American Educational Research Journal*, 33(2), 383-417.
- Leventhal, T., & Brooks-Gunn, J. (2000). The neighborhoods they live in: The effects of neighborhood residence upon child and adolescent outcomes. *Psychological Bulletin*, 126, 309-327.
- Lewit, E. M., & Baker, L. S. (1994). Child indicators: Race and ethnicity—changes for children. *Future of Children*, 4(3), 134-144.
- Lewit, E. M., & Baker, L. S. (1994). Children's health and the environment. *Future of Children*, 5(2), 8-10.
- Liaw, F. R., & Brooks-Gunn, J. (1993). Patterns of low birth weight children's cognitive development and their determinants. *Developmental Psychology*, 29(6), 1024-1035.
- Linver, M., Brooks-Gunn, J., & Kohen, D. (2002). Family processes as pathways from income to young children's development. *Developmental Psychology*, 38 (5), 719-734.
- Love, J. M., Aber, L., & Brooks-Gunn, J. (1994). *Strategies for assessing community progress toward achieving the first national educational goal*. Princeton, NJ: Mathematica Policy Research, Inc.
- Love, J.M., Kisker, E.E., Ross, C.M., Schochet, P.Z., Brooks-Gunn, J., Paulsell, D., Boller, K., Constantine, J., Vogel, C., Fuligni, A.S., Brady-Smith, C. (2002). Making a difference in the lives of infants and toddlers and their families: The impacts of Early Head Start. Washington, D.C.: U.S. Department of Health and Human Services. Retrieved from <http://www.mathematica-mpr.com/3rdLevel/EHSTOC.HTM>
- Maccoby, E. E., & Martin, J. M. (1983). Socialization in the context of the family: Parent-child interaction. In P. H. Mussen (Ed.), *Handbook of Child Psychology* (Vol. 4, pp.1-102). New York: John Wiley & Sons.
- Mayer, S. (1997). *What money can't buy: The effect of parental income on children's outcomes*. Cambridge, MA: Harvard University Press.
- McCarton, C. M., Brooks-Gunn, J., Wallace, I. F., Bauer, C. R., Casey, Pat et al. (1997). Results at age 8 years of early intervention for low-birth-weight premature infants: The Infant Health and Development Program. *Journal of the American Medical Association*, 277(2), 126-132.
- McKey, R. H., Condelli, L., Granson, H., Barrett, B., McConkey, C., & Plantz, M. (1985). The impact of Head Start on children, families and communities. *Final report of the Head Start Evaluation, Synthesis and Utilization Project*. Washington, DC: CSR, Inc.
- McLoyd, V. (1998). Socioeconomic disadvantage and child development. *American Psychologist*, 53(2), 185-204.
- Moore, K., Evans, J., Brooks-Gunn, J., & Roth, J.L.(2001). What are good child outcomes? In A. Thornton (Ed.), *The well being of children and families: Research and data needs*. (pp. 59-84) Ann Arbor, MI: University of Michigan Press.
- Mosteller, F. (1995). The Tennessee study of class size in the early school grades. *Future of Children*, 5(2), 113-127.
- Olds, D., Henderson, C., & Kitzman, H. (1994). Does prenatal and infancy nurse home visitation have enduring effects on qualities of parental caregiving and child health at 25-50 months of life? *Pediatrics*, 93, 89-98.
- Olds, D. L., Henderson, C. R., Kitzman, H. J., Eckenrode, J. J., Cole, R. E., & Tatelbaum, R. C. (1999). Prenatal and infancy home visitation by nurses: Recent findings. *The Future of Children*, 9, 44-65.
- Ramey, C. T., & Ramey, S. L. (1998). Prevention of intellectual disabilities: Early interventions to improve cognitive development. *Preventive Medicine*, 27, 224-232.
- Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, 277, 918-924.
- Shonkoff, J. P., & Meisels, S. J. (Eds.). (2000). *Handbook of early childhood intervention* (2nd ed.). New York, NY: Cambridge University Press.
- Smith, J. R., Brooks-Gunn, J., & Klebanov, P. K. (1997). Consequences of living in poverty for young children's cognitive and verbal ability and early school achievement. In G. J. Duncan & J. Brooks-Gunn (Eds.), *Consequences of growing up poor* (pp. 132-189). New York, NY: Russell Sage Foundation Press.
- Smith, J.R., Brooks-Gunn, J., Kohen, D., & McCarton, C. (2001) Transitions on and off AFDC: Implications for parenting and children's cognitive development. *Child Development*, 72 (5), 1512-1533.
- St. Pierre, R.G., Layzer, J.I., & Barnes, H.V. (1995). Two-generation programs: Design, cost and short-term effectiveness. *The Future of Children*, 5(3), 76-93.
- U.S. Census Bureau. (1999). *Statistical abstract of the United States: 1999*. (p. 417, No. 660). Washington, DC: U.S. Government Printing Office.
- Werner, E. E. (1995). Resilience in development. *Current Directions in Psychological Science*, 4(3), 81-85.
- Yeung, J., Linver, M., & Brooks-Gunn, J. (2002). How money matters for young children's development: Parental investment and family processes. *Child Development*, 73 (6), 1861-1879.
- Yoshikawa, H. (1995). Long-term effects of early childhood programs on social outcomes and delinquency. *The Future of Children*, 5(5), 51-75.
- Zhao, H., & Brooks-Gunn, J. (2002). *The effects of income on elementary school children's achievement scores*. New York:

Table 1

Short and long-term effects of selected early intervention programs on participating children

	IQ test	Achievement test	Behavior	Special education	Grade repetition	High school graduation	Crime/delinquency	Employment	Income	Welfare Participation	Teen pregnancy
Perry Preschool (27)	7	14		27	27	27	27	19	27	27	19
Houston PCDC (11)	2	8 - 11	4 - 7	8 - 11	8 - 11						
Abecedarian Project (21)	12	21		15	15						
IHDP – Full sample (8)	8	8	3	8	8						
IHDP – Heavier low birthweight sample (8)	8	8	5	8	8						

Source: Karoly et al., 1998; Campbell et al., in press

Note: Number in box refers to age of child when measure was last taken. When results were mixed, the age refers to the last age when the effect was significant. Cells with no numbers indicate that the outcome was not measured for that project.

PCDC: Parent Child Development Center; IHDP: Infant Health and Development Program

Table 2

Cognitive and behavioral problem test scores for low-birthweight, premature children in the IHDP intervention at ages 3, 5, and 8

	Intervention group	Follow-up only group	Difference
IQ scores			
Heavier LBW			
Age 3	97.9	83.6	14.3***
Age 5	95.4	91.7	3.7*
Age 8	96.5	92.1	4.4**
Lighter LBW			
Age 3	91.5	84.4	7.1***
Age 5	89.8	91.3	-1.5
Age 8	88.3	89.5	-1.2
PPVT-R scores			
Heavier LBW			
Age 3	92.7	83.3	9.4***
Age 5	84.5	78.5	6.0**
Age 8	92.4	85.7	6.7**
Lighter LBW			
Age 3	89.2	84.4	4.8***
Age 5	80.9	80.3	0.6
Age 8	81.6	84.4	-2.8
Behavior problem scores			
Heavier LBW			
Age 3	42.0	48.6	-6.6**
Age 5	29.2	33.3	-4.1
Age 8	30.0	31.3	-1.4
Lighter LBW			
Age 3	44.3	46.7	-2.4
Age 5	33.1	32.8	0.4
Age 8	33.0	31.9	1.1

*** $p \leq 0.01$. ** $p \leq 0.01$. * $p \leq 0.05$.

Sources: Brooks-Gunn et al., 1994; McCarton et al., 1997

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