

# CEPP

Discussion Paper Series

**Investing in Preschool Programs**

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## Executive Summary

### Investing in Preschool Programs

At the beginning of kindergarten, the math and reading achievement gaps between children in the bottom and top income quintiles amount to the equivalent of over 100 SAT points -- more than a full standard deviation. Early childhood education programs provide child care services and may facilitate the labor market careers of parents, but their greatest potential value is as a human capital investment in young children, particularly children from economically disadvantaged families. Can early childhood education programs can be designed to provide the kinds of enrichment that low-income children most need to do well in school and succeed in the labor market?

In this study, Greg Duncan and Katherine Magnuson summarize the available evidence on the extent to which expenditures on early childhood education programs constitute worthy social investments in the human capital of children. A brief summary of their analysis is presented here.

#### Analysis

##### *Meta-Analysis: Comparing Results across Studies*

A comparison of the cognitive and achievement treatment effects from 84 early childhood education programs shows the following:

- The simple average effect size across all 84 programs is .35 standard deviations, an amount equal to nearly half of the racial achievement gap for kindergarten-aged kids.
- The studies with the fewest subjects (and consequently least amount of precision) had the largest effect sizes - when the precision of each study is taken into account, the average effect size drops to .21 standard deviations.
- Programs beginning before 1980 produced significantly larger effect sizes (.33 standard deviations) than those that began later (.16 standard deviations). While declining effect sizes over time are disappointing, they are likely driven by the fact that, over time, the quality of the home environments provided by low-income families has improved and many more low-income children are enrolled in child care centers than before.
- Longer-duration programs do not appear to have larger effects.
- Evidence on starting age is mixed, but taken as whole, effect sizes were neither larger nor smaller for children who started programs at younger ages.

##### *Model Program Impacts: Perry Preschool and Abecedarian*

The Perry Preschool and Abecedarian programs are prominent studies from the 1960s and 1970s. While achievement gains for these programs, as measured by test scores, tend to fade over time, a key reason for the importance of these studies is that long-term follow-ups show strikingly positive impacts in adulthood. Nevertheless, it is difficult to extract policy lessons from these initiatives for early childhood education programs that might be offered by government today. Both programs were designed and evaluated by researchers and each served only several dozen children – conditions that scaled-up programs cannot match. In addition, the low levels of maternal education for both Perry and Abecedarian treatment groups may have led to larger program impacts than we would expect to achieve today given the relative rise in years of completed schooling by poor mothers.

### *Head Start Impacts*

Large-scale policy lessons might be gleaned more reliably from studies of Head Start, since that program now provides services to almost a million three- and four-year-olds. Both quasi-experimental and a random-assignment evaluations of Head Start found significant short-term gains in participants' achievement test scores but, as with Perry and Abecedarian, these gains appeared to fade over time. However, as with Perry and Abecedarian programs, quickly declining test score impacts for recent cohorts of Head Start children appear to be at odds with the long-term impacts on important young adult outcomes found in analyses of older Head Start cohorts. Some of the older-cohort studies use strong quasi-experimental methods and find quite striking long-run program impacts.

### *Pre-Kindergarten Programs*

Some rigorous evaluations of pre-kindergarten programs were completed too recently to have been included in the meta-analysis described earlier. Several of these studies find short-run effects on achievement test scores that are somewhat larger than those estimated in the national Head Start Impact Study. However, longer-run impacts are only evaluated up to the third grade. While there is evidence of persisting math impacts (.18 standard deviations), the lack of longer-run evaluations beyond the third grade suggests that drawing strong policy conclusions about their effectiveness is unwarranted. Other programs have likewise demonstrated early promising results that faded over the first few years of school.

### *The Puzzle: Academic Fade-Out of Long-Term Benefits*

Most early childhood education studies that have tracked children beyond the end of the program treatment find that effects on test scores fade over time. An analysis of cognitive and achievement outcomes in the meta-analytic database shows an estimated decrease in program impact effect sizes of about .03 standard deviations per year, which implies that positive effects persist for roughly 10 years. This finding raises a puzzle: How do we reconcile the fade-out of

preschool program impacts on test scores during elementary school with the evidence showing that such programs nonetheless have beneficial impacts on a broad set of later-life outcomes like high school graduation rates, teen parenthood, and criminality? One possible answer is that preschool programs may affect something other than basic achievement and cognitive test scores, and perhaps these other program impacts, unlike achievement and cognitive impacts, persist over time. Several theories of human development that allow for preschool programs to generate more broad impact on children's behavior and social competence have been presented. Despite arguments in their favor, testing these theories is difficult since most preschool studies do not measure many of these kinds of outcomes at program completion. Those studies that have included measures of problem behavior have produced mixed results. Reconciling disparate patterns of impacts in the short and longer term is a key challenge for anyone hoping to extract policy lessons about the effectiveness of early childhood education programs.

### *Within-Program Heterogeneity*

Although policymakers appropriately care most about the average impacts of early childhood education programs, a number of lessons can be learned from looking at how the effects vary across certain sub-groups. A finding of heterogeneous impacts might make it possible to identify groups that could particularly benefit from the preschool setting. However, a systematic accounting of heterogeneity in the effects of preschool programs is a complicated undertaking. Even when studies determine that a particular program has been a success overall, the positive outcomes differ across programs and populations. Efforts to accurately identify differential effects across subgroups are often hampered by small sample sizes. Nonetheless, given the potential benefits, greater attention should be given to understanding both who benefits the most from particular programs and why.

### *The Search for Active Program Ingredients*

Research on early childhood education has focused greater attention on evaluating particular programs than on identifying the particular ingredients in these programs that produce significant improvements in children's learning and behavior. Some scholars have focused on structural aspects of early childhood education environments, such as class size and teacher education, yet these features of programs are likely to affect children only indirectly, by influencing their experiences within classrooms. Potentially more important for children's actual experiences in early childhood education programs, is what developmental psychologists have referred to as "process quality" – the quality of classroom interactions, including the amount of instructional and emotional support children receive. As attention has shifted to improving classroom interactions, two aspects of program design emerge as policy levers that may, together, improve program effectiveness: curriculum and related professional

development. It appears that an effective strategy is to combine a proven curriculum that offers well-designed lesson plans and activities based on an understanding of children's trajectories of learning within specific content areas, with strong professional development to target improvement in specific instructional practices.

### **Policy Recommendations**

Evaluations of most early childhood education programs show that they improve children's school readiness. Some longer-run evidence shows that these impacts can extend into adulthood, although it is unclear whether this is likely to be the case with large-scale programs offered today. Most promising today are pre-kindergarten classrooms with proven curricula and well-trained staff.

More specific policy recommendations require a change in how research is conducted in this area. Rather than looking merely at average short-run outcomes of early childhood education programs based on a limited number of achievement tests, researchers should focus on the heterogeneity of outcomes across groups, conduct long-term follow-up, and examine a wide range of outcome variables that would illuminate the program ingredients and developmental processes that make some of these programs so successful.