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Can Intensive Early Childhood Intervention Programs Eliminate Income-Based Cognitive and Achievement Gaps?

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Executive Summary

Can Intensive Early Childhood Intervention Programs Eliminate Income-Based Cognitive and Achievement Gaps?

It is no secret that children from different socioeconomic strata start school with very different skills. Recent research has shown that low-income children score about 1.3 standard deviations lower than high-income children in their kindergarten-entry math skills and nearly two-thirds of a standard deviation worse in terms of teacher-reported antisocial behavior. None of these gaps shrinks over the course of elementary school. An important policy question is how to close this income-based gap in school readiness in young children.

Early childhood education programs are seen as one way of improving the schooling readiness of poor children and enabling them to take full advantage of the benefits of K-12 educational investments. The Abecedarian and Perry Preschool programs have often been cited as evidence of the long-run impacts and high benefits relative to costs of high quality programs. However, extracting broad policy lessons from these two programs is difficult, given their very different starting ages and intensities. Moreover, both programs were offered only to small numbers of low-income minority children. Because of this, they cannot shed light on intervention effects among children of more advantaged families or show how these effects might differ from those observed in children from less advantaged families.

Some government-funded programs are universal while others target children from low-income families. Universal programs would close income-based gaps only if their impacts were much larger for poor children than more affluent children. The goal of this paper is to estimate the degree to which an intensive Abecedarian-type intervention, begun at birth or age one but lasting only until age three, would close income-based gaps in cognitive ability and school readiness.

Analysis

Data are drawn from the Infant Health and Development Program (IHDP). The IHDP was a randomized clinical trial which offered a package of services including free, full-day, Abecedarian-type child care to a randomly chosen subset of 985 one and two-year old children in eight sites scattered around the country. Since eligibility was not restricted by family income, race or ethnicity, a very diverse set of children and families enrolled in the program. Children were assessed at ages 1, 2, 3, 5 and 8. At each age children were administered an IQ test, and at age 8 math and reading achievement levels were measured as well. The IHDP sample can be weighted to reflect the demographic characteristics of U.S. children. Using data from this randomized, controlled experiment the authors ask these questions:

- To what degree (if at all) does the program close the cognitive-ability and school-readiness gap between children from higher-income and lower-income families?
- Does the extent to which the cognitive gap is closed vary depending on whether the program is offered universally versus to children from low-income families only?
- Do benefits from the program persist after the program is completed and, if so, for how long and to what degree?

Results

Table 1 presents results from the study. The values in the first row show program impacts on children's test scores, expressed as a fraction of a standard deviation of the test metric. The first row represents

the entire treatment effect experienced by children from high-income families. The second row represents the additional fraction of one standard deviation that test scores of children from low-income families changed as a result of being treated by the program. Children from low-income families experienced a rise in test scores equivalent to the sum of the values in rows one and two. Row three represents the percent of the income-based cognitive gap that is closed in the case of a universally offered program. Row four represents the percent of the gap that is closed if the program is targeted to low-income families only.

Table 1.

Estimated Impacts of IHDP on High/Low IQ and Income-Based Achievement Gaps

	Age 1 IQ	Age 2 IQ	Age 3 IQ	Age 5 IQ	Age 8 IQ	Age 8 Reading	Age 8 Math
Baseline Program Effect on All Children:	0.11	0.46*	0.34	-0.22	-0.08	-0.44	-0.2
Additional Program Effect on Children From Low-Income Families:	0.04	0.82**	1.28***	0.77**	0.52	0.74**	0.64**
Percent of Income-Based Cognitive Gap Closed by Univeral Treatment:	-	75%**	89%***	101%*	67%	90%*	84%**
Percent of Income-Based Cognitive Gap Closed by Treatment Targeted to Low-Income Children:	-	117%***	113%***	72%***	57%**	37%	57%**

Note: Estimates have varying degrees of precision. Estimates with three asterisks are more precise than those with one or two asterisks. Those estimates that have no asterisks are the least precise and are not considered statistically significant in this setting.

These results suggest that at age three – at the end of the program – income-based gaps would be essentially eliminated with either a universal or income-based targeted program. Despite considerable fadeout of program effects, income-based gaps in age five IQ would be substantially reduced (in the case of a targeted program) or completely eliminated (for a universal program). At age eight the results are less precise, but they still suggest that one-third to three-quarters of the gaps in IQ and achievement would be eliminated.

Policy Implications

While it is encouraging to see that school readiness gaps between high and low-income children might be eliminated with an intensive early education program, several cautions are in order. First, the low (three to one) staff-to-student ratio and other services offered made this program quite expensive. Prudent policy planning should be based on a comparison of benefits and costs of this and competing programs. Second, given societal concern with gaps defined by race or ethnicity it is tempting to assume that these interventions could be helpful in closing those gaps as well. However, one should not presume that success in closing the income-based gap generalizes directly to gaps defined by other factors. Third, drawing firm conclusions is difficult because none of the gap-closing estimates is determined with much precision. Fourth, the evolving patterns of impacts found for low and high-income children depend upon the quality of care for control-group children during and after the program. If current patterns of care quality for low and high-income children differ from those in the late 1980s, then the patterns of impacts and gap closings found here may not generalize to the current day. Fifth, while these results suggest that the intervention could be helpful for low-income children, we need to better understand the effects on children from high-income families. In this study, the effects on the IQs of higher-income children are positive during and directly after the program ends. However, as the child ages (at 5 and 8 years of age), estimates of effects on IQ and achievement for these children are negative (though statistically insignificant). Prior to including this type of intervention

in policy aimed at closing income-based school readiness gaps, it is important to know whether a program like this might actually hurt higher-income children.

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