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Early Learning, Later Success: The Abecedarian Study

Early Childhood Educational Intervention for Poor Children

Executive Summary

Background

Poverty in early childhood has long-lasting negative consequences for cognitive development and academic outcomes, as shown by numerous studies. Comparisons among different groups of school children find that poor children fare worse academically than those raised in more advantageous circumstances. Poor children begin to lag behind in the earliest school years, suggesting that they enter school not adequately prepared for success.¹

In an effort to overcome the negative academic odds for poor children, early childhood education has been provided both in rigorous, University-based model programs and at the state and national levels. Such endeavors were generally based on the theory that providing early intellectual stimulation would enhance cognitive development, thereby allowing children to enter school better prepared to learn. This should in turn increase the probability of early school success, lead to later scholastic success, and eventually, result in vocational achievement and successful social adaptation in adulthood.

Unfortunately, few early childhood programs have been sufficiently well controlled to permit scientists to evaluate the extent to which long-term outcomes are attributable to the program itself. Low numbers of participants or high attrition among samples reduced confidence in findings from some University-based programs. Many state and local programs lacked the degree of scientific control necessary for firm conclusions.

From pooled long-term results of other early childhood programs, investigators concluded that such programs were associated with reductions in the degree to which treated children were placed in special education and retained in grade during the public school years.² Short-term gains in cognitive development were also found along with boosts in academic performance. However, both kinds of gains tended to erode 3 to 6 years after participants entered school.

The Abecedarian Project differed from most other early childhood programs in that: 1) it began in early infancy whereas other programs began at age 2 or older, and 2) treated children had five years of exposure to early education in a high quality child care setting whereas most other programs were of shorter duration.

The Abecedarian Project

The Abecedarian Project was a carefully controlled study in which 57 infants from low-income families were randomly assigned to receive early intervention in a high quality child care setting and 54 were in a non-treated control group. This degree of scientific control gives investigators greater confidence that differences between the treated and untreated individuals can be attributed to the intervention itself, rather than to differences among treated and untreated families.

The treated children received full-time educational intervention in a high-quality childcare setting from infancy through age 5. Each child had an individualized prescription of educational activities consisting of "games" that were incorporated into his or her day. These activities addressed social, emotional, and cognitive development but gave particular emphasis to language.

The treated and untreated children were initially comparable with respect to scores on infant mental and motor tests. However, from the age of 18 months and through the completion of the child care program, children in the intervention group had significantly higher scores on mental tests than children in the control group. Follow-up cognitive assessments completed at ages 12 and 15 years showed that the intervention group continued to have higher average scores on mental tests. The treatment/control group gap narrowed but the trajectories did not converge. Effect sizes remained moderate.

Treated children scored significantly higher on tests of reading and math from the primary grades through middle adolescence. Effect sizes for reading were large; those for math were large to moderate.

The investigators have now completed a young-adult follow-up assessment of study participants. At age 21, cognitive functioning, academic skills, educational attainment, employment, parenthood, and social adjustment were measured. One-hundred-four of the original 111 infants (53 from the intervention group and 51 controls) were assessed.

Major Findings of the Young Adult Follow-Up Study

Young adults who received early educational intervention had significantly higher mental test scores from toddlerhood through age 21 than did untreated controls. Averaged over the age span tested, the mental test score effect size for treatment was moderate and considered educationally meaningful.

Enhanced language skills in the children appears to have mediated the effects of early intervention on mental test performance (i.e., cognitive skills).

Reading achievement scores were consistently higher for individuals with early intervention. Treatment effect sizes remained large from primary school through age 21. Enhanced cognitive

skills appeared to mediate treatment effects on reading achievement.

Mathematics achievement showed a pattern similar to that for reading, with treated individuals earning higher scores. Effect sizes were medium in contrast to the large effects for reading. Again, enhanced cognitive functioning appeared to mediate treatment effects.

Those with treatment were significantly more likely still to be in school at age 21 – 40% of the intervention group compared with 20% of the control group.

A significant difference was also found for the percent of young adults who ever attended a four-year college. About 35% of the young adults in the intervention group had either graduated from or were at the time of the assessment attending a four-year college or university. In contrast, only about 14% in the control group had done so.

Young adults in the intervention group were, on average, one year older (19.1 years) when their first child was born compared with those in the control group (17.7 years), although the youngest individuals in both groups were comparable in age when their first child was born.

Employment rates were higher (65%) for the treatment group than for the control group (50%), although the trend was not statistically significant.

Policy Implications

The importance of high quality, educational childcare from early infancy is now clear. The Abecedarian study provides scientific evidence that early childhood education significantly improves the scholastic success and educational attainments of poor children even into early adulthood.

The Abecedarian study began treatment in early infancy, emphasizing the importance of providing a learning environment for children from the very beginning of life. Every child deserves a good start in an environment that is safe, healthy, emotionally supportive, and cognitively stimulating.

Welfare reform means that, more than ever, poverty children will need early childcare. The educational stimulus value of these early caregiving years must not be wasted.

Childcare officials should be aware of the importance of quality care beginning in infancy. Quality care requires sufficient well-trained staff to ensure that every child receives the kind of appropriate, individualized attention provided by the Abecedarian model.

Future research should concentrate on identifying the specific learning techniques most effective for all groups and types of young children. More and more of America's children will need out of home care. This is especially true for poor children. We must not lose this opportunity to provide them the early learning experiences that will increase their chances for later success.

Acknowledgements

The age-21 follow-up of the Abecedarian study was funded jointly by The Maternal and Child Health Bureau of the Department of Health and Human Services (grant: MCJ-370632)

The National Institute on Early Childhood Development and Education of the Office of Educational Research and Improvement, Department of Education (OERI, grant: R306F960202)

The David and Lucile Packard Foundation (grants: 95-1796, 96-1752, 98-1047)

Earlier phases of the research were primarily funded by a series of grants from:

The Mental Retardation and Developmental Disabilities Branch of the National Institutes of Child Health and Human Development

The State of North Carolina

The findings of the Abecedarian Project do not necessarily reflect the views of the granting agencies.

1. Alexander, K. L., & Entwisle, D. R. (1988). Achievement in the first 2 years of school: Patterns and processes. *Monographs of the Society for Research in Child Development*, 53 (Serial No. 218).
2. Lazar, I., Darlington, R., Murray, H., Royce, J., & Snipper, A. (1982). Lasting effects of early education: A report from the consortium for longitudinal studies. *Monographs of the Society for Research in Child Development*, 47 (Serial No. 195).

Representative Articles:

Ramey, C. T., & Campbell, F. A. (1984). Preventive education for high-risk children: Cognitive consequences of the Carolina Abecedarian Project. *American Journal of Mental Deficiency*, 88, 515-523. This article describes the child care program in detail and presents findings from cognitive testing of study participants from early infancy through age 54 months.

Ramey, C. T. & Campbell, F. A. (1991). Poverty, early childhood education, and academic competence: The Abecedarian experiment. In A. Huston (Ed.), *Children reared in poverty* (pp. 190-221). New York: Cambridge University Press. This chapter describes a school-age component of the project and presents findings from cognitive testing of study participants in the

primary grades of school.

Campbell, F. A. & Ramey, C. T. (1994). Effects of early intervention on intellectual and academic achievement: A follow-up study of children from low-income families. *Child Development*, 65, 684-698. In this article, results of cognitive and achievement testing of study participants at age 12 are presented.

Campbell, F. A., & Ramey, C. T. (1995). Cognitive and school outcomes for high-risk African-American students at middle adolescence: Positive effects of early intervention. *American Educational Research Journal*, 32, 743-772. This article presents results of cognitive and achievement testing at age 15 as well as data concerning grade retention and assignments to special education.

Burchinal, M. R., Campbell, F. A., Bryant, D. M., Wasik, B. H., & Ramey, C. T. (1997). Early intervention and mediating processes in cognitive performance of children of low-income African American families. *Child Development*, 68, 935-954. In this article, the Abecedarian data are combined with a similar program called project CARE and the mechanisms by which early intervention affected cognitive performance are examined.

Ramey, C. T., Campbell, F. A., Burchinal, M., Skinner, M. L., Gardner, D. M., & Ramey, S. L. (in press). Persistent effects of early intervention on high-risk children and their mothers. *Applied Developmental Science*. In addition to presenting results of child testing, this article presents findings demonstrating the benefits of the availability of high-quality, consistent child care for the mothers of children in the Abecedarian study.

If you want to contact them:

This press release, graphics, biographies of the researchers, an executive summary of the Abecedarian Age 21 Follow-Up Study, and other information may be found at <www.fpg.unc.edu/~abc> This web site will open at 9 a.m. EDT on 10/18/99.

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University of North Carolina at Chapel Hill: 919-966-6386. Her email address is <liz_pungello@unc.edu>.