

PRESCHOOL PROGRAMS

Preschool Programs for the General Population

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Introduction and Subject

There are several small-scale randomized controlled trial (RCT) studies in the United States documenting the benefits of curriculum-led experimental preschool programs and “pre-kindergarten” education for long-term educational, occupational and social outcomes for disadvantaged children.¹ In addition a larger-scale quasi-experimental study² in Chicago found similar benefits up to age 28 of sustained, publicly-funded early education to subsequent education, socio-economic status, health and crime for a disadvantaged population. Such programs are cost-effective with disadvantaged groups, at risk for poor outcomes, in that the savings outweigh any costs.³

Besides benefits for disadvantaged groups, there is strong evidence that preschool education, whether or not a specialized program or routine provision, is beneficial for the general population. Studies of population-representative samples in the U.S. find benefits for school readiness of prekindergarten experiences,^{4,5} with greater if preschool started between 2 and 3 years of age.⁶ Similar evidence also occurs outside the U.S.^{7,8} and effects are long-term (e.g., preschool prior to compulsory education at age 5 in a population sample was associated with increased qualifications, employment and earnings up to age 33).⁹ In France, preschool (école maternelle) is a universal, free, education program with access from age 3. During the 1960s and 1970s large-scale expansion in France led to the enrollment of 3-year-olds increasing from 35% to 90% and of 4-year-olds from 60% to 100%. Based on state-collected data of representative samples there were sizable and persistent effects indicating that preschool helps children succeed in school and obtain higher wages in the labor market. Preschool also appeared to reduce socioeconomic inequalities as children from less advantaged backgrounds benefitted more than the more advantaged.¹⁰ Likewise in Switzerland the impact of preschool expansion was associated with improved intergenerational educational mobility with children from disadvantaged backgrounds benefiting most.¹¹ Further evidence comes from the expansion of preschool education for 3 to 6 year olds in Norway during the 1970s, where examining differential implementation of preschool by municipalities and

population education and employment data, it was found that preschool participation was associated with strong benefits for later educational and labor market outcomes across the population.¹²

Recent Research Results

A meta-analysis of 125 preschool studies concluded that preschool was associated with substantial effects for both cognitive and socio-emotional outcomes often through to adulthood. Preschool programs with a greater emphasis on educational experiences appeared to have larger effect sizes.¹³ Most of the research on early childhood education and care (ECEC) has occurred in developed countries. However some research has focused on the potential for ECEC to improve general population outcomes for developing countries. For example, preschool was found to boost primary school achievement in Bangladesh,¹⁴ with similar results reported in a review of studies from ten countries.¹⁵ With the expansion of preschool provision in Uruguay comparisons were possible of a) siblings with and without preschool and b) regions varying in preschool expansion. The study revealed clear benefits in terms of academic achievement from preschool up to secondary school.¹⁶ Similar analyses in Argentina found that one year of preschool was associated with primary school attainment increases by a moderate but important degree.¹⁷ A review of the available evidence¹⁸ concluded that increasing preschool enrolment was amongst the most effective ways of improving child outcomes and would have substantial benefits with a very favourable benefit-to-cost ratio.

Critically in the experimental intervention studies^{19,3,2} the quality of the preschool was high. General population studies from the U.S.²⁰ and England^{7,8} provide more variability in quality and indicate that the quality of universal preschool is critical for longer-term beneficial effects. In England, controlling for background influences, the comparison of high-quality preschool with no preschool on age 11 outcomes, where quality was measured by standardized observations, revealed effects that were moderate for literacy and substantial for numeracy and that were important for later educational progress.⁸ Low-quality preschool had no beneficial effect. Preschool effects deriving from, on average, 18 months of preschool were similar to those for six years of primary school. The beneficial effects of preschool education on educational achievement and social development have been found up to age 14 in this English study.^{21,22} Similar results were obtained in a parallel study conducted in Northern Ireland; children who had attended high quality preschool were 2.4 times more likely to attain the highest grade in national assessments at age 11 in English, and 3.4 times more likely in mathematics, than children without preschool.²³

The Organisation for Economic Cooperation and Development (OECD) examined educational attainment data for 65 countries, finding that literacy at age 15 was strongly associated with preschool participation in countries where a large proportion of the population use preschool, where preschool is for more months, and where there were measures to maintain the quality of preschool. They concluded that widening access to preschool can improve performance and equity by reducing socioeconomic disparities, if extending coverage does not compromise quality.²⁴

Some studies have looked in more detail about the specific skills that are related to experiencing more, high-quality preschool. Preschool experiences can improve children's longer-term executive functioning,²⁵ linked to enhanced cognitive and social-emotional outcomes. Similar long-term effects can be seen for specific areas of educational attainment such as mathematics,^{26,7,23} scientific thinking²⁷ and literacy.^{8,23}

Determining Causality

Randomized controlled trial designs are generally not feasible with preschool provision for the general population, and non-experimental designs are the norm. Hence it is possible that the associations found between preschool experience and development, reflect selection effects. These issues have been discussed extensively,²⁸ and while it remains possible that unmeasured variables are the basis of a selection effect (omitted variable bias) the interpretation that associations are the result of casual effects of preschool experiences is strengthened by the inclusion of statistical control for many possible basis-for-selection covariates, reflecting child, family and sometimes neighbourhood characteristics, as for example in the EPPE (effective provision of preschool education) study.^{7,8}

Another approach to this problem is the use of change models. If differences exist prior to preschool experience this would support the selection effect interpretation; conversely if developmental differences emerge after preschool this supports a casual interpretation. As preschool experience has been found to be not only associated with post-preschool development, but also with enhanced progress over the preschool period,²⁹ this further supports a casual interpretation. Another strategy is the regression-discontinuity design. Comparing “young” kindergarten children who had just completed preschool to “old” preschool children just beginning preschool, the results clearly indicated preschool effects upon school readiness test scores.³⁰

Other evidence supportive of a casual interpretation of preschool effects comes from a study of twins.³¹ Longitudinal data from a nationally-representative sample over 600 monozygotic and dizygotic twin pairs shows the contributions of genes, shared environment and non-shared environment to cognitive development for children varying in preschool experience. Attending preschool was associated with reductions in shared environmental influences on academic skills at kindergarten entry and was prospectively associated with reduced family-level influences on academic skills. Before preschool the contribution of shared environment influences on cognition was similar for preschool and non-preschool groups but after preschool, shared environment influences were 43-47% of variance for the preschool group, while for the non-preschool group they were 72-83% of the variance.

In summary the evidence overwhelmingly supports a causal interpretation of the long-term effects of preschool education.

Implications for Policy

Such evidence has fueled an increasing interest in the universal provision of preschool education as a means of advancing the school readiness and later attainment of children and their subsequent social, economic and occupational success.^{3,32} Indeed some argue that preschool experience is critical for children's future competence, coping skills, health, success in the labor market, and consequently the social and economic health of the nation.³³ In a technologically sophisticated world a population's educational attainment is likely to be increasingly important for a nation's economic development, as argued by the US Federal Reserve chair, “Research increasingly has shown the benefits of early childhood education and efforts to promote the lifelong acquisition of skills for both individuals and the economy as a whole. The payoffs of early childhood programs can be especially high.”³⁴ Thus preschool education is not only an intervention for disadvantaged groups and a means of advancing educational and social development for all.,but also it becomes part of the infrastructure for

economic development. Some countries (e.g., China) appear to have taken this perspective on board in their focused development of preschool provision.³⁵

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