

# SOURCES OF EDUCATIONAL GROWTH IN AMERICA

by

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The twentieth century has witnessed an educational revolution in the United States. A look at census statistics reveals the magnitude of this trend. Persons born during the first five years of the century achieved a median of 8.6 grades of schooling, while persons born at midcentury reached a median of 12.8 grades; in 1910 only 62.5% of young Americans aged 5-19 were enrolled in school, but by 1974 this figure reached 89.4%. The growth of educational attainment in the population has implications for many aspects of social life: the economic and social standing of individuals and occupations, political attitudes and behavior, consumer behavior, attitudes toward work and leisure, and marriage and fertility patterns. And yet the causes of this phenomenon are not well understood.

To be sure, one can cite a number of related modern social trends. Real family incomes have increased substantially throughout the century; the farm population has dwindled while the urban population and nonfarm segments of industry have grown; the labor market has demanded higher-skilled and better-educated workers, and has paid them better; compulsory school attendance laws have been passed; and school systems have been bureaucratized, extended, and enriched. But which, if any, of these changes have actually caused successive generations to spend more of their lives in school, and which are merely collateral developments?

## Research Perspectives on Educational Growth

Sources of change in levels of educational attainment may be broadly divided into two categories, social demographic and macroeconomic. At any time, there are social demographic factors affecting how far an individual goes in school. Persons from high-income families, from families in which parents are well educated, and from small families tend to go the farthest. Over successive generations, as family incomes and parents' educational levels rise and as family sizes decline, average levels of school attainment increase.

The macroeconomic sources of change in educational attainment are aggregate market incentives, such as the costs of schooling and the expected economic advantage to having more education. At any one time these factors are experienced in approximately the same way by all persons of a given age, but as economic conditions change over time, the incentives to stay in school alter.

Most research on educational growth has emphasized only one or the other of these perspectives, rather than both. In a recent study of the sources of educational growth in America, therefore, I have attempted to examine social demographic and macroeconomic perspectives simultaneously. The study combines the best available survey data

Robert Mare, "Social Background and School Continuation Decisions," Institute for Research on Poverty Discussion Paper no. 462-77.

Robert Mare, "Market and Institutional Sources of Educational Growth," Institute for Research on Poverty Discussion Paper no. 494-78.

Robert Mare, "Social Background Composition and Educational Growth," *Demography* 16 (February 1979). Also Institute for Research on Poverty Discussion Paper no. 471-77.

### *Related Publications:*

Robert Mare, *The Growth and Distribution of Schooling* (New York: Academic Press, forthcoming [1979]).

Robert Hauser and David Featherman, "Equality of Schooling: Trends and Prospects," Institute for Research on Poverty Reprint no. 193.

on family background and educational attainment for persons born during the twentieth century with aggregate social and economic statistics from published sources.

There are many benefits to this dual approach. First, it promises a more comprehensive understanding of educational growth. In particular, it can indicate whether changes in the perceived economic value of school credentials can indeed explain variations in educational attainment levels that are not related to changes in the family backgrounds of students. Second, it may lead to more accurate forecasting of school and college enrollments. Third, this approach affords a context within which to examine the effects of organizational and political factors (as opposed to strictly economic factors) on schooling—such factors as the quality of school systems, political support for education, and laws pertaining to attendance, military service, and child labor. Finally, it responds to the current demand for more focus on institutional and labor market effects in research on socioeconomic attainment.

## Data and Analytic Approach

The data for the study are the 1973 Occupational Changes in a Generation Survey (OCG) and published information on the national economy and schools. From survey data one can determine, first, the effects of social background factors on school attainment; second, the extent to which long-term changes in the social backgrounds of Americans have caused the rise in attainment; and, finally, how much change in attainment would have occurred had there been no change in the social backgrounds of students. In other words, one can examine the *net* impact of market and institutional influences on educational growth. Data limitations have restricted the analysis to the white male population.

At each stage of schooling, individuals must decide whether to go on to the next level (within the limits of compulsory education laws). To compare the set of people born in a given year (a "birth cohort") with those born in a different year, we can look at either their average levels of attainment or we can look at the proportion who go on

at each specific level—for example, entry to high school. These “grade progression rates” can then be linked to economic and social conditions prevailing at the time that stage in the schooling process is reached.

## Schooling and Social Background

Much research has documented the effects on educational attainment of aspects of family background such as parental occupational status, income, and education; number of siblings; intactness of family; region of birth; and farm versus nonfarm origin. The present study shows how these effects change over various stages of the schooling process and the implications for the number of people who will go on in school at various levels.

For every birth cohort, there is a similar pattern of family background influences throughout the schooling process. These effects are strongest at the earliest levels of schooling and weakest at the higher levels of schooling. For example, the effect of family income on the chances that a young child will finish eighth grade is twice as large as its effect on the chances that a high school graduate will go on to college. Paradoxically, then, it is the stage when schooling is most universally available that family background nonetheless plays the largest role in selecting those relatively few individuals who drop out. In contrast, when it becomes more problematic whether individuals can continue in school—at the college entry level—the effect of family background, though significant, is weaker.

Given the effects of family background on the decision to continue in school at each point in time, changes in the characteristics of families have implied intercohort increases in grade progression rates. The income, educational attainment, and occupational status of parents have increased while average number of siblings and the percentage of families on farms have decreased. Thus, more students have continued at all levels of schooling. As we have noted, however, the effects of the family are stronger in the elementary and high school years than at the college level. The impact of changing family background characteristics on changes in grade progression rates, then, has been much stronger at the lower levels of schooling.

This has an important implication for the future of educational growth in America. Historically, most of the change in average levels of educational attainment has occurred through changes in the percentage of each birth cohort continuing in school or completing school at the elementary and high school levels. (There are, of course, much larger proportions of young persons attending college now than in the past. But this has occurred mainly as a result of increases in high school graduation rates, rather than increases in rates of continuation between high school and college.) Since high school graduation has become almost universal, however, *future* educational growth must occur through increasing rates of grade progression at the college level—the level where family background effects are weakest. Thus the changes in family characteristics necessary to produce significant increments in average educational attainment in the future must be larger than in the past.

It seems clear that the influence of family background does not fully explain the long-run growth in educational achievement that has characterized the United States in the twentieth century. In fact, only one-third to one-half of the changes in rates of grade progression over cohorts born during the first half of this century can be ascribed to the changes in family background characteristics described earlier. Without changes in factors that operate independent of the family, moreover, the long-run growth in educational attainment will slow down.

In looking both for explanations of current changes and for ways to make accurate future projections, we must, then, turn to the influence of market and institutional factors.

## Market and Institutional Factors

In the present study, three sets of these factors have been examined: economic returns to schooling, the costs of schooling, and the characteristics of educational institutions.

*Economic returns to schooling.* During this century, the most rapidly growing occupations and industries have had work forces with better than average educational credentials. This has apparently kept the demand for relatively well-educated workers high enough to maintain their earnings advantage. So long as this advantage exists, there is an economic incentive to remain in school. We are assuming, then, that persons in the labor force with varying amounts of schooling serve as “reference groups” for persons still in school. When the relative earnings of better educated workers are particularly high, grade progression rates should rise more rapidly; when the earnings advantage of education is lower, progression rates should not increase so quickly.

It is no easy task to assess this hypothesis. To determine *which* groups of workers are the ones whose experience is most salient to the perceptions of students requires complex exploratory data analysis (not detailed here). And, unfortunately, the limited available data permit analysis of only the first jobs of recent labor force entrants. But even with these restrictions, the answers that have emerged are unambiguous. If we hold constant the effect of changing family backgrounds, fluctuations in economic returns to schooling affect grade progression rates at every level of schooling, especially at the higher levels—as might be expected. But even prior to high school graduation, educational growth has historically been guided by labor market incentives. These incentives are by no means the whole answer, however. What about the costs of schooling?

*Costs of schooling.* These include both the direct costs associated with schooling—tuition, transportation, books, and supplies—and “opportunity” costs—that is, employment opportunities foregone while attending school.

At the college level, fluctuations in tuition and fees should be inversely related to fluctuations in grade progression rates. Below college there are no recorded data series of direct schooling costs, but it might be expected that a family’s ability to meet schooling costs will vary directly with

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employment opportunities for parents. Carrying this one step further, grade progression should vary inversely with the level of unemployment.

How do we assess the opportunity costs foregone at different points? These can be indexed by *changes* in unemployment rates (as opposed to the level of unemployment) for the labor force as a whole. When the labor market is on the upswing more employment opportunities are open for young persons, making schooling seem less attractive. Conversely, when the labor market deteriorates there are fewer jobs to entice young persons out of school.

The data show that changes in grade progression rates from high school to college are indeed negatively affected by rises in tuition. Employment levels show significant effects for elementary school completion, high school graduation, and college entry, though not for high school entry. As for the opportunity costs, favorable labor market conditions significantly depress the growth in grade progression rates at the college level and depress growth somewhat less at all other transitions except for high school graduation.

*Characteristics of educational institutions.* Schools are better, and accessible to more young people, than they were 70 years ago. Can we expect these factors to yield changes in educational growth, particularly at the elementary and high school levels? Historical data from the Office of Education's Biennial Survey of Education allow us to assess the effects of the following: school expenditures per pupil, teachers' salaries, average days attended per pupil, number of one-teacher public schools, and number of four-year colleges.

The effects that these characteristics might have are fairly straightforward. The higher the per pupil expenditures, on average, the more diversified are curricula likely to be, and the better the physical facilities. These make school attendance easier and more attractive, and are thereby expected to increase grade progression rates. Teachers' salaries should be correlated (at a lag) with the quality of instruction received by students: The higher the pay, in general, the better the quality of the people attracted to teaching. And the better the instruction, the greater the number of students who will be qualified to continue their schooling—thus the higher the rates of grade progression.

Average days attended per pupil should positively affect grade progression for two reasons. First, this measures the intensiveness of schooling; longer terms imply increased student ability to continue schooling. Second, the traditional schooling pattern of seasonally interrupted attendance in favor of farm or other child labor encourages early labor force participation and withdrawal from school; conversely, lengthy school terms imply a break from this tradition, and a decline in the salience of competing work opportunities.

The prevalence of one-teacher schools also indicates the strength of the traditional rural schooling patterns. As schools consolidated they adopted more diversified cur-

ricula and a more rigidly age-graded organization that may have enhanced grade progression rates. Finally, the number of colleges is a measure of the physical accessibility of higher education; it may have a net positive effect on progression between high school and college.

The findings again corroborate most of our assumptions. Teachers' salary levels and instructional expenditures show significant positive effects at all transition points. When students average more days in school annually they are indeed more likely to continue, particularly at high school graduation (but not at high school entrance). There is, in fact, some evidence that the effects of economic factors on high school graduation are transmitted via average daily attendance: When labor market returns to high school graduation are above average or when overall unemployment is increasing, high school students tend to miss fewer days of school; this improved attendance, in turn, raises graduation rates. The consolidation of schools has tended to improve rates of elementary school completion, as indicated by the net negative effect of the number of one-teacher schools. The number of institutions of higher education, however, appears to play no significant role in college entry rates.

The significance of school characteristics for school continuation may seem somewhat surprising, given the weight of previous social science findings that such effects are minimal once family characteristics have been taken into account. But bear in mind that this study focuses on the long-run historical experience of the United States. The conclusion that the changing quality of schools has, over the long run, contributed to higher levels of formal achievement is not incompatible with the findings of cross-sectional or short-term studies that school characteristics have had modest or insignificant effects.

## Conclusion

Several broad conclusions arise from this research. First, the pattern of family, organizational, and market effects accords with our intuition about the differential impact of various institutions over the early life cycle: The effects of family background and school characteristics decline and the effects of labor market returns and costs of schooling increase from the early to the later stages of the schooling process. Second, while persistent economic advantages to well-educated workers have affected educational growth, these effects do not dominate the data. Rather, while students (and their families) respond to their perceptions of the labor market, this is only one among many influential factors. Finally, the changing characteristics of school systems induce changes in attainment levels, in contrast to what much cross-sectional evidence would lead one to suspect. For the purposes of both gaining a historical understanding of educational growth in America and forecasting future attendance, therefore, structural characteristics of schools need to be taken into account, as well as the demographic profiles of students and the labor markets they face.

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