

# The Consequences of Global Educational Expansion

Social Science Perspectives

*Emily Hannum and Claudia Buchmann*

AMERICAN ACADEMY  
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# Preface

What would be the consequences if every child in the world received a primary and secondary education of high quality? On March 1, 2002, we had the privilege of participating in a discussion of a draft paper by Emily Hannum and Claudia Buchmann that addressed this important question. The revised paper, benefiting from the insights of that lively discussion, is published here.

Present at the workshop, in addition to the three of us and Hannum and Buchmann, were: Leslie Berlowitz (American Academy of Arts and Sciences), Henry Braun (Educational Testing Service), Oeindrila Dube (Brookings Institution), Tamara Fox (William and Flora Hewlett Foundation), Elizabeth King (World Bank), Deborah Levison (University of Minnesota), Lant Pritchett (Harvard University), Francisco Ramirez (Stanford University), Gene Sperling (Council on Foreign Relations), Daniel Wagner (University of Pennsylvania), and David Weil (Brown University). We thank each of them for their guidance. The workshop was one in a series convened by the American Academy's project on Universal Basic and Secondary Education (UBASE).

The UBASE project, which we are leading, focuses on the rationale, the means, and the consequences of providing the equivalent of a primary and secondary education of quality to all the world's children. Our starting point is the observation that very large numbers of school-age children living in developing countries are not currently enrolled in school. The deficits are especially pronounced among girls, and they are concentrated in South Asia and Sub-Saharan Africa.

Access to primary school has increased sharply in recent decades in most of the developing world, to levels that, in some regions, approach those in developed countries. But secondary school attendance, which has also risen rapidly, is still relatively low compared to that in the developed countries. The quality of the education offered, at both the primary and secondary levels, leaves much to be desired, as judged by examination of a wide range of inputs, outputs, and practices of educational systems in most developing countries.

None of these observations is novel. Representatives of 155 countries who gathered in Jomtien, Thailand, in 1990, noted a qualitatively similar picture, and pledged that they would achieve universal primary education by the year

2000. The world has not achieved that goal. The United Nations, in its adoption of the Millennium Development Goals in 2000, decided on a fifteen-year extension for the achievement of universal education. These goals have been accepted by the United Nations system and its member states as the central imperative and coordinating theme of all efforts at international development.

The central premise underlying these efforts is that universal access to education will promote economic development, improve health, expand political participation, reduce social and gender inequities, and diminish adverse human impacts on the planet.

Hannum and Buchmann provide a clear-eyed review of the research on the presumed consequences of primary and secondary education. They find substantial evidence that increased primary and secondary education is associated with improved health, greater economic opportunity, and lower population growth. But controversy surrounds the proposition that investment in education results in measurable increments to growth in gross domestic product. The evidence is likewise ambiguous on whether education reduces social inequality and promotes democratization. The summary by Hannum and Buchmann of what is known, and what remains to be determined, is critical for guiding future policy and research in this area, since the rationale for pursuing universal basic and secondary education must be clear if such education is to attract political support.

This paper is the first in a series of Occasional Papers of the UBASE project to be published by the American Academy. Forthcoming papers will examine related topics including:

- basic facts about education, and the nature and quality of the data that underpin these facts;
- the intellectual and programmatic history of efforts to achieve universal education;
- the goals of primary and secondary education in different settings, and how progress toward those goals is assessed;
- means of implementing universal education, and the uses of technology in delivering more and better education;
- health and education;
- the politics of, and obstacles to, educational reform;
- the costs of achieving universal education, and the distribution of those costs among possible payers.

The complexity of achieving universal basic and secondary education extends beyond the bounds of any single discipline and necessitates disciplinary rigor as well as interdisciplinary, international, and cross-professional collaboration. By focusing on both primary and secondary education, paying attention to access, quality, and cultural diversity, and encouraging fresh perspectives, we hope that the UBASE project will accelerate and enrich educational development.

This project is supported by a generous three-year grant from the William and Flora Hewlett Foundation, and by grants from John Reed, the Golden

Family Foundation, Paul Zuckerman, an anonymous donor, and the American Academy of Arts and Sciences. The project also benefits from the advice of a distinguished advisory committee, whose names are listed below.

As with all Occasional Papers of the American Academy, responsibility for the views presented in this paper rests with its authors.

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# The Consequences of Global Educational Expansion: Social Science Perspectives

EMILY HANNUM AND CLAUDIA BUCHMANN

Among development agencies, conventional wisdom holds that educational expansion facilitates numerous favorable changes for nations and individuals. Improved economic welfare and health, reduced inequalities, and more democratic political systems are just some of the purported benefits often invoked in pleas for the expansion of education throughout the world. A recent World Bank document on the United Nations' Education for All initiative provides a characteristic example:

[G]lobal research . . . has established unequivocally that education increases individual incomes; that it is positively correlated with macroeconomic growth; that it is strongly correlated with reductions in poverty, illiteracy and income inequality; and that it has strong complementary effects on the achievement of . . . lower infant and child mortality, better nutrition, and the construction of democratic societies. The expansion of educational opportunity, which can simultaneously promote income equality and growth, is a “win win” strategy that in most societies is far easier to implement than the redistribution of other assets, such as land or capital. In short, education is one of the most powerful instruments known for reducing poverty and inequality and for laying the basis for sustained economic growth, sound governance, and effective institutions (2002a: v).

Similar rationales for investments in education are readily found in other documents produced by the World Bank, the United Nations Educational, Scientific, and Cultural Organization (UNESCO), the United Nations Children's Fund (UNICEF), and other international organizations supporting the goal of improving access to education worldwide (see World Bank, 1999, 2002b; UNESCO, 2002; UNICEF, 1995).

We have benefited from conversations with Joel Cohen, David Bloom, Martin Malin, Francisco Ramirez, and participants in UBASE discussion meetings. We also appreciate comments provided by Henry Braun, Mack Lipkin, Paul Zuckerman, Aaron Benavot, and Eli Ginzberg.

In recent years, scholars have begun to question the empirical foundations of statements like the one above that portray education as a panacea for a variety of social ills (e.g., Easterly, 2001; Benavot, 2002). However, to our knowledge, studies have not emerged that carefully consider cross-disciplinary evidence about the range of commonly claimed consequences of educational expansion. To address this gap, this paper discusses evidence behind six related assumptions about the consequences of educational expansion for economic and social development:

- Human capital stock is central to national economic development, as better-educated citizens are more productive.
- Within societies, the expansion of educational opportunities enables individuals to improve their economic circumstances.
- Educational expansion narrows social inequalities within nations by promoting a meritocratic basis for status attainment.
- Countries with better-educated citizens have healthier populations, as educated individuals make more informed health choices, live longer, and have healthier children.
- The populations of countries with more educated people grow more slowly, as educated citizens are able to implement a virtuous cycle of having fewer children.
- Countries with more educated populations are more democratic, as their citizens are able to make more informed political decisions.

As our discussion will illustrate, some of these statements are consistent with the findings of social science researchers working from a variety of disciplinary perspectives. However, some of the expected consequences remain plagued by controversy. For other hypothesized consequences of educational expansion, contradictory or inconclusive findings from disciplines other than economics suggest that evidence is more equivocal than these statements indicate.

We draw evidence from empirical studies in sociology, demography, economics, political science, and anthropology. Where possible, we also illustrate links between education and economic, health, demographic, and political changes with recent data for a wide range of countries. We conclude with a discussion of insights gleaned from prior research regarding the possible consequences of achieving universal primary and secondary education, and for future research on the consequences of educational expansion.

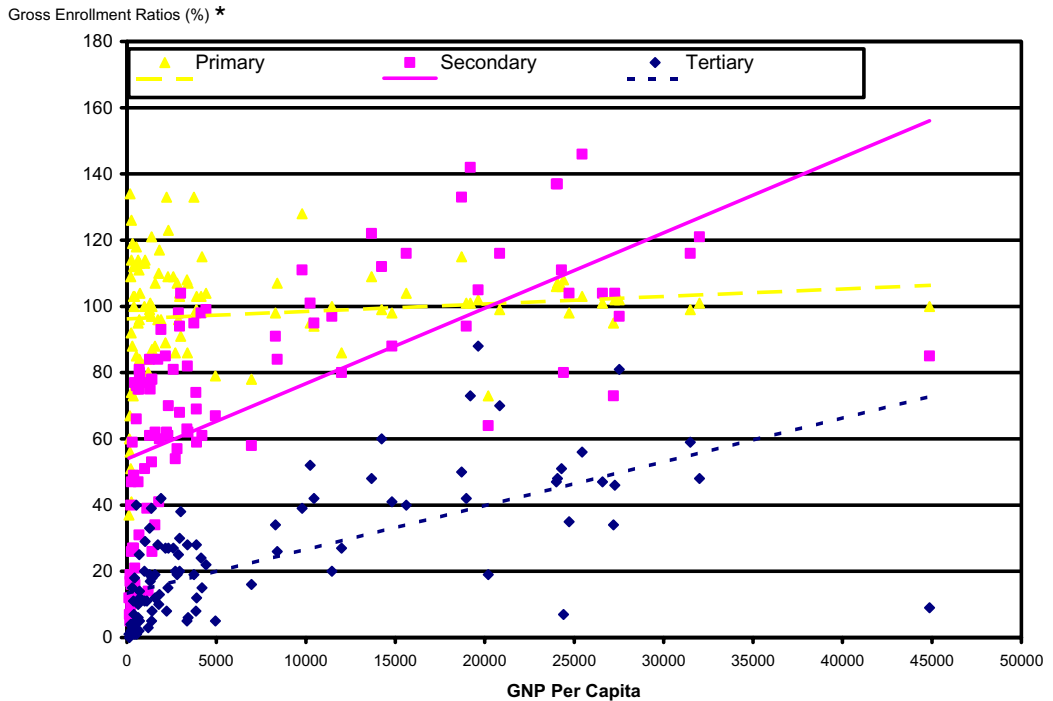
## EDUCATION AND NATIONAL ECONOMIC DEVELOPMENT

*Human capital stock is central to national economic development, as better-educated citizens are more productive.*

On the one hand, there is an obvious coincidence of educational expansion and national economic development: developed countries tend to have more

educated populations than less-developed countries. Figure 1 presents an illustration of the relationship, graphing primary, secondary, and tertiary gross enrollment ratios against gross national product (GNP) per capita for 102 countries with complete data in 1995. Data points for individual countries and trend lines for each level of education are included. Figure 1 demonstrates that countries with higher per capita GNPs have higher ratios of educational enroll-

Figure 1: Gross Enrollment Ratios by GNP Per Capita



\* Gross enrollment ratios represent the total enrollment in a specific level of education, regardless of age, expressed as a percentage of the official school-aged population corresponding to the same level of education in a given school year. Because the numerators include over-age and under-age students, while the denominators do not, gross enrollment ratios can be greater than 100.

Note: Countries are Algeria, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Benin, Botswana, Brunei, Bulgaria, Cambodia, Canada, Chad, Chile, China, Colombia, Comoros, Croatia, Cyprus, Czech Rep., Denmark, Egypt, El Salvador, Eritrea, Estonia, Ethiopia, Finland, France, Georgia, Germany, Greece, Guatemala, Guinea, Guyana, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Kazakhstan, Kuwait, Kyrgyz Rep., Laos, Latvia, Lebanon, Lesotho, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Norway, Oman, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, S. Korea, Saudi Arabia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Swaziland, Sweden, Tanzania, Thailand, Togo, Trinidad & Tobago, Tunisia, Turkey, Uganda, the United Kingdom, the United States, Vietnam, and Zimbabwe.

Source: Created from data in U.S. Agency for International Development. 2000. "Global Education Database (GED) 2000 Edition," <[http://www.usaid.gov/educ\\_training/ged.html](http://www.usaid.gov/educ_training/ged.html)>, accessed June 2002.

ment, especially at secondary and tertiary levels.<sup>1</sup> There is less variation between poorer and wealthier countries in terms of their primary enrollment ratios, as indicated by the flatter slope of the trend line. More rigorous evidence supporting the link between human capital stock and growth can be found in Barro's (1991) study, which shows a positive relationship between initial enrollment rates and economic growth in 98 countries. Most recently, in a synthesis of the empirical growth literature, Petrakis and Stamatakis (2002) similarly concluded that economies with a larger stock of human capital experience faster growth.

Further supporting the beneficial consequences of educational expansion for growth is research on the impact of government investments in education. Poot's (2000) synthesis of research on the impact of government policies on long-run growth concludes that the most definitive results relate to the positive impact of education expenditures: eleven of the twelve empirical studies identified showed significant, positive effects of educational expenditures on growth.<sup>2</sup> Sylwester (2000) similarly finds a long-term positive effect of educational expenditures on economic growth.<sup>3</sup>

On the other hand, associations between measures of educational expansion and indicators of economic growth are open to interpretation. Scholars do not agree on the best way to isolate causal impacts on national development. Two factors contribute to the controversy: the difficulty of distinguishing the effects of growth on education from the effects of education on growth, and the possibility that other factors drive both educational expansion and economic growth. Indeed, some recent studies cast doubt on whether a positive relationship between educational expansion and economic growth really exists (e.g., Levine and Renelt, 1992: Table 5; Easterly, 2001: 71–85; see Krueger and Lindahl, 2000 for a critical review). Emblematic of this line of research is Pritchett's (1996) aptly titled piece, "Where Has All the Education Gone?" Pritchett uses two cross-national time-series data sets spanning the 1960s to the mid-1980s and finds that the rate of growth of educational capital is not significantly related to growth in GDP per worker.

One possible explanation for controversies surrounding the education-growth relationship is a mismatch between education and labor market demands in some countries. In settings where the formal sector is poorly

1. Correlations between per capita GNP and enrollment ratios derived from the same data provide further illustration: the correlation of per capita GNP with the primary gross enrollment ratio is weak and marginally significant (0.16,  $N=131$ ,  $p=0.07$ ), while the correlations with secondary and tertiary gross enrollment ratios are strong and significant (0.64,  $N=121$ ,  $p=0.00$  for secondary; 0.63,  $N=107$ ,  $p=0.00$  for tertiary). One reviewer suggested investigating these relationships among countries with per capita GNP below \$5,000. With this restriction in place, results showed a somewhat stronger association at the primary level (0.34,  $N=94$ ,  $p=0.00$ ), a similar association at the secondary level (0.59,  $N=85$ ,  $p=0.00$ ), and a weaker association at the tertiary level (0.40,  $N=74$ ,  $p=0.00$ ).

2. See Poot (2000), Table 4. The studies identified were Ansari and Singh (1997), Baffes and Shah (1998), Barro (1991, 1997), Evans and Karras (1994), Glomm and Ravikumar (1997), Hansson and Henrekson (1994), Landau (1983), Levine and Renelt (1992), Moomaw and Williams (1991), Sala-i-Martin (1994), and Singh and Weber (1997).

3. Sylwester (2000) found that educational expenditures were negatively related with contemporaneous growth, but that previous expenditures were positively related.

developed, education may be seen as filling slots in the labor market, rather than helping individuals create new opportunities in the market. To the extent that labor markets are static in this way, the incidence of unemployment may rise with education and increases in education may reduce total output (Krueger and Lindahl, 2000: 10). On average, however, increasing enrollments do not appear to bring negative consequences for employment rates. Column 1 in Table 1 shows the results of fixed-effects panel regressions of the economic activity rate of 25–29 year-olds for 144 countries with valid data, spanning the years between 1970 and 2000. Controlling for population size and per capita GNP, the significant, positive coefficients of secondary and tertiary enrollment ratios suggest that as enrollment ratios at both levels increased, economic activity rates increased as well. Yet, the possibility that unemployment rises with educational expansion may be particularly relevant in countries where those most likely to benefit from increased educational expansion, such as women and the rural poor, historically have been excluded from wage employment.

Other scholars attribute ambiguous results regarding the relationship between education and economic development to data problems such as measurement error and time-frame limitations. Krueger and Lindahl (2000) maintain that there is considerable measurement error in country-level education data, particularly at secondary and tertiary levels. After accounting for measurement error, they find that an increase in years of schooling has little short-term effect on GDP growth, but a positive and statistically significant effect on economic growth over periods of ten to twenty years (2000: 25).<sup>4</sup>

A third possible explanation for mixed results is that different levels of schooling may not have consistent consequences for growth across countries. Petrakis and Stamatakis (2002) demonstrate that the levels of education that matter for economic development may depend on the nations' level of development: in less developed countries, primary and secondary education may matter more; in more developed countries, tertiary education may matter more.

A final complication is that past studies may tell us less about the future, as globalization and technological change modify the imperative for education. Using an index of technological progress constructed of five components (personal computers, Internet hosts, fax machines, mobile phones, and televisions), Rodríguez and Wilson (2000) show that human capital investment is positively related to national technological progress. They argue that there may be particular synergies between technology and human capital, and

4. While much research on education and national development has focused on the issue of growth, an equally important aspect of national economic development is the distribution of income. Studies suggest beneficial consequences of educational expansion for income distributions. Theoretical work in economics predicts that income inequality declines with support for public education (Glomm and Ravikumar, 1992). In an empirical study of 50 countries, Sylwester (2002) showed that public education expenditures were associated with a subsequent decrease in the level of income inequality. Sylwester (2002) argues that costs must be low enough that individuals have enough resources to forego income and attend school. If individuals are too poor to attend school, then promoting public education can cause the distribution of income to become more skewed.

Table 1: Panel Regressions of Seven Outcomes on Gross Enrollment Ratios

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Economic Activity Rate, 25-29 <sup>1</sup>	Internet Users per 100 Population <sup>2</sup>	Life Expectancy at Birth <sup>3</sup>	Total Fertility Rate <sup>3</sup>	Infant Mortality Rate (per 1000) <sup>3</sup>	Political Rights Index <sup>4</sup>	Civil Liberties Index <sup>4</sup>
Tertiary Gross Enrollment Ratio <sup>3</sup>	0.14 (3.49)***	0.20 (5.66)**	0.07 (2.89)**	-0.01 (1.62)	-0.25 (2.53)*	0.03 (3.81)**	0.04 (4.55)**
Secondary Gross Enrollment Ratio <sup>3</sup>	0.08 (3.48)***	-0.05 (2.63)**	0.10 (7.76)**	-0.02 (7.34)**	-0.43 (7.55)**	0.00 (0.93)	-0.01 (1.46)
Primary Gross Enrollment Ratio <sup>3</sup>	-0.01 (0.37)	0.02 (1.01)	0.09 (6.26)**	-0.01 (2.41)*	-0.68 (10.24)**	0.01 (2.60)**	0.03 (5.15)**
GNP/Capita <sup>3</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Population	0.00 (0.21)	0.00 (0.25)	0.00 (2.89)**	0.00 (5.87)**	0.00 (3.13)**	0.00 (0.89)	0.00 (1.96)
Constant	69.73 (41.71)***	-7.00 (2.79)**	49.54 (40.17)**	5.96 (18.62)**	139.90 (23.63)**	3.31 (9.64)**	1.96 (4.62)**
Number of Observations	375	367	554	661	690	953	953
Number of Countries	144	103	142	145	144	151	151
R-squared (Within)	0.58	0.32	0.52	0.33	0.45	0.03	0.07

Note: Absolute value of t statistics are in parentheses; \*\*\* denotes significance at 10%, \*\* denotes significance at 5%, and \* denotes significance at 1%. Models are estimated using data on outcome y for country i at time t, and allow for different intercepts ( $u_i$ ) for countries, but constrain the slopes ( $\beta$ ) to be the same across countries. Models are estimated as  $y_{it} = (\alpha + u_i) + \beta X + e_{it}$ .

<sup>1</sup>Source: United Nations. 2002. "United Nations Common Database," <http://unstats.un.org>, series 4270: Economic activity rate by sex, 13 age groups, 1950-2010 (ILO) [204 countries, 1950-2010], accessed July 2002.

<sup>2</sup>Source: United Nations. 2002. "United Nations Common Database," <http://unstats.un.org>, series 29969: Internet users per 100 population (ITU estimates) [209 countries, 1980-2001], accessed June 2002.

<sup>3</sup>Source: U.S. Agency for International Development. 2000. "Global Education Database (GED) 2000 Edition," [http://www.usaid.gov/educ\\_training/ged.html](http://www.usaid.gov/educ_training/ged.html), accessed June 2002.

<sup>4</sup>Source: Freedom House, Inc. 2000. "Annual Survey of Freedom Country Scores 1972-73 to 1999-00," <http://www.freedomhouse.org/ratings/index.htm>, accessed June 2002.

that high levels of education may be a necessary condition for technological innovation and adaptation. Column 2 in Table 1 shows some suggestive results by regressing Internet users per 100 population on enrollment ratios, population, and per capita GNP. Only tertiary gross enrollment ratios are significantly positively linked to Internet use. In fact, controlling for tertiary enrollment ratios, secondary enrollment ratios are significantly negatively related to Internet use. This example, together with Rodríguez and Wilson's study, suggests that globalization and technological change may be forging new mechanisms that link advanced skills to national development—mechanisms that may modify old relationships.

#### EDUCATION AND INDIVIDUAL ECONOMIC WELFARE

*Within societies, the expansion of educational opportunities enables individuals to improve their economic circumstances.*

The supposition that nations with more educated individuals should prosper hinges on the notion that better educated individuals are socialized in ways that increase their productivity and improve their economic standing. Researchers in the fields of sociology and economics have thoroughly investigated these assumptions. Sociologists have examined patterns and trends in individuals' school-to-work transitions and occupational attainment. These studies reveal that whether education enables individuals to find better jobs and improve their economic status varies across industrialized and industrializing countries (see Blau and Duncan, 1967; Shavit and Kraus, 1990; Bills and Haller, 1984; Hannum and Xie, 1998; Treiman et al., 1996; Shavit and Mueller, 1998). Similarly, in the field of economics, studies show dramatic variations in the rates of return on investments in education across countries (Nielsen and Westergaard-Nielsen, 2001), as well as within countries across levels of schooling, social groups, and time periods (Moll, 1996; Psacharopoulos and Velez, 1992; Demetriades and Psacharopoulos, 1987). Variations notwithstanding, these studies attest to the importance of education as a determinant of individuals' occupational outcomes and subsequent economic status.

One concern about results such as these, however, is raised by the credentialism hypothesis. This hypothesis holds that education signals individuals who are privileged or talented, providing a convenient "job queue" for employers, rather than actually improving the productivity of individuals.<sup>5</sup> If education were primarily a process of credentialing (rather than generating) productivity, cross-sectional studies of occupational attainment or rates-of-return could tell us little about the consequences of further educational expansion. But empirical evidence casts doubt on such strict credentialist arguments. Using a variety of techniques to correct for potential biases due to ability, much international research offers strong support for the notion that education is an important determinant of earnings (Lam and Schoeni, 1993

5. However, as discussed below, considerable evidence supports a different form of the credentialism argument: that educational credentials often serve to reproduce older forms of social inequality.

for Brazil; Duflo, n.d. for Indonesia; Psacharopoulos and Velez, 1992 for Colombia). Krueger and Lindahl (2000) review studies that have exploited natural experiments to estimate returns to schooling and conclude that the impact of education persists with ability and other factors controlled. One particularly convincing approach took advantage of a natural experiment to trace the impact of school construction on earnings in Indonesia. This study estimated wage increases of 1.5 to 2.7 percent for each additional school built per 1,000 children (Duflo, n.d.: 34).

Further, in less-developed settings, educational expansion, particularly among women, also appears to have significant implications for the human capital of children of the newly-educated (Schultz, 2002). For example, Behrman and colleagues (1999: 682) argue that a component of the significant positive relationship between maternal literacy and child schooling in India reflects the productivity effect of home teaching. This effect, combined with the increase in returns to schooling for men, underlies the expansion of female literacy following the onset of the green revolution.<sup>6</sup> The mechanisms underlying such findings are illuminated in anthropological studies in developing countries. For example, LeVine's cross-cultural research shows that education helps women acquire aspirations, skills, and models of learning that eventually affect their child-bearing and child-rearing behaviors (LeVine et al., 1991; LeVine et al., 2001).

These studies attest to the benefits of increased schooling for economic outcomes of individuals, and to the likely echo effects on their children. Yet, forecasting the specific economic implications of rising educational attainments is extremely complex, absent access to unusual data sources such as, for example, those on school construction utilized by Duflo (n.d.). Part of the difficulty is that individuals' economic opportunities are linked not only to their own human capital, but also to larger structural constraints.

One complicating structural factor is that the poor, whose children are most likely to be out of school, are increasingly concentrated among social groups whose opportunities to translate schooling into productive activities may be very different from those of groups already reached by the school system. For example, in Latin America and China, both poverty and non-enrollment are concentrated in poor rural settings where returns to education tend to be low (Lopez and Valdez, 2000; Piazza et al., 2001; Zhao, 1997). Children in impoverished and isolated areas often lack ready access to urban labor markets in which educational credentials directly affect employment. For this reason, the link between education and economic welfare for those remaining outside of the school system may be different, on average, than for those already in the school system.<sup>7</sup>

6. These findings may not apply in developed settings, where educational opportunities are relatively expanded. In a study using twins data from the United States, Behrman and Rosenzweig (2002) suggest that the observed positive relationship between the schooling of mothers and their children is substantially biased upward due to correlations between schooling and heritable "ability" and assortative mating. They conclude that in the US, an increase in women's schooling would not be beneficial in terms of the schooling of children.

7. These issues have global significance, as some estimates suggest that rural poverty accounts for nearly 63 percent of poverty worldwide (Khan, 2000).

A second important structural constraint is that the value of an individual's own educational credential depends in part on how it compares to the credentials of others in the local population or labor market. As the average level of schooling in the population increases, the value of an individual's given level of education in the labor market declines. This phenomenon is termed "credential inflation." Economic studies that have tried to trace credential inflation empirically have found that it is more than a theoretical problem (e.g., Moll, 1996; Demetriades and Psacharopoulos, 1987; Psacharopoulos and Velez, 1992).

Sociological research suggests that credential inflation depends also on the institutional structures of national education systems. Shavit and Mueller's (1998) study of linkages between educational qualifications and occupations in thirteen industrialized countries demonstrates this point. In some countries, education is valued for the specific vocational skills it confers; in others, for providing workers with general knowledge; in others still, for sorting students by scholastic ability or potential to learn. Synthesizing empirical results from studies of each country in their project, Shavit and Mueller (1998) argue that where education's main purpose is to sort students, there is a built-in incentive for young people to acquire more education in order to stay ahead of the queue. As ever-larger proportions of a population obtain a credential, its labor market value declines. In contrast, in countries where vocational qualifications are used by employers to organize jobs and allocate persons among them, the value of a credential derives not from its scarcity, but rather from the specific skills it represents. In such contexts, credential inflation is less of a problem. Shavit and Mueller's work suggests that estimates of the economic outcomes of educational expansion may be affected in unknown ways by the presence of unobserved structural differences within, as well as outside, school systems.

#### EDUCATION AND SOCIAL INEQUALITY

*Educational expansion narrows social inequalities within countries by promoting a meritocratic basis for status attainment.*

Structural constraints acknowledged, a convergence of evidence suggests that education plays an important role in improving the absolute economic standing of individuals. Whether educational expansion improves the *relative* standing of historically disadvantaged groups such as the poor, ethnic minorities, and women is a different question. Much of the sociological research attempting to answer this question has been guided by the idea that industrialization promotes greater social mobility (Treiman, 1970). This "industrialism hypothesis" holds that as societies develop, urbanization, mass communication, and industrialization should lead to greater social openness and a shift from particularistic to universalistic bases of achievement. These changes, in turn, should tighten the link between education and economic mobility. Data constraints have precluded systematic evaluation of the industrialism hypothesis,

but existing studies show only mixed support for the notion that development and educational expansion bring increased social mobility (e.g., Kelley and Perlman, 1971; Holsinger, 1975; Bills and Haller, 1984; Bills et al., 1985; Mukweso et al., 1984). In the following sections, we discuss evidence regarding the impact of educational expansion on socioeconomic, gender, and ethnic inequalities.

### *Socioeconomic Inequality*

Substantial research indicates that educational expansion does not reduce the relative advantages of elite children over children from less-privileged backgrounds. Educational expansion alone does not change the relative position of social groups in the “education queue,” and elites manage to maintain their status by getting more education than the masses (Walters, 2000: 254). Research from a wide range of societies finds little change in educational opportunities between social strata over the course of educational expansion (e.g., Mare, 1981; Halsey et al., 1980; Smith and Cheung, 1986; Shavit and Kraus, 1990; Shavit and Blossfeld, 1993). As Walters (2000: 254) notes, these findings highlight the need to consider separately the effects on educational opportunity of an increase in the overall size of the educational system (i.e., school expansion) and changes in the rules by which educational opportunities are allocated (i.e., school reform).

Even expansions in education accompanied by reforms designed to modify the allocation of educational opportunities within society do not always reduce educational inequality. Raftery and Hout (1993; see also Hout et al., 1993) argue that a process of “maximally maintained inequality” explains why many sweeping reforms intended to make education more egalitarian have not accomplished their purpose. When advantaged groups are not fully integrated at a given level of education, they strongly support efforts to expand educational participation by eliminating tuition fees and increasing capacity. Expansion at these levels of education does not lead to greater equality between social groups because advantaged groups, who tend to favor education, can garner the largest share of valuable educational credentials (Mare, 1981; Halsey et al., 1980). In such cases, expansion does not alter the effect of social background on educational transitions. Furthermore, elite groups are well-positioned to see that their children are channeled into higher quality educational experiences, even within given levels of schooling. This advantage, invisible in research that looks only at levels of schooling attained, also serves to maintain preexisting inequalities.

### *Gender Inequality*

Evidence from countries around the world indicates a global, long-term trend toward equalization of the allocation of schooling between girls and boys (King and Hill, 1993; Knodel and Jones, 1996; Shavit and Blossfeld, 1993; Schultz, 1993b). Nonetheless, there are some important caveats to this generalization. In South Asia and the Middle East, expanding education overall has

occurred in the context of persistent, sometimes extreme gender gaps (King and Hill, 1993). For example, in Nepal, during a period when entrance and completion rates rose for girls, rates for boys also rose. The gender gaps themselves did not substantially narrow (Stash and Hannum, 2001).

Sometimes, the persistence of gender gaps is linked to cultural norms surrounding women's roles in society, particularly women's access to paid employment. Norms of female participation in the labor-force can also condition the consequences of educational expansion among girls. Reduced gender disparities in education are not always mirrored by reduced gender gaps in employment and income. For example, a study of five Asian nations using World Fertility Survey data showed that in the 1970s higher levels of educational attainment had little impact on female labor-force participation in Korea, the most developed and highly-educated of the societies under study (Cameron et al., 2001). Similarly, research comparing women's education and employment in Taiwan and Korea found very different education-employment relationships for women in the two societies. In Taiwan, higher levels of education increased women's probability of employment; in Korea, highly-educated women were less likely to be employed. The difference was likely due to the fact that an adequate supply of educated males offered Korean employers few incentives to reduce barriers to married women's employment, while in Taiwan, an inadequate male labor force pressured employers to alter "patriarchal preferences" (Brinton et al., 1995: 1111). Finally, research on South Africa and Israel in the 1980s concluded that, despite relatively egalitarian patterns of educational attainment by gender, there were clear-cut gender differences in occupational attainment (Mickelson et al., 2001).

### *Ethnic Inequality*

Because of the close link between education and occupational outcomes, increased absolute levels of education are likely to benefit disadvantaged ethnic groups. However, it is not safe to assume that expansion in access to education will allow disadvantaged minorities to "catch up" with initially advantaged ethnic groups, at least in the short run. For example, in Nepal, educational expansion across ethnic groups in recent decades has not led to substantial narrowing in educational disparities across these groups (Stash and Hannum, 2001). Instead, patterns of access to formal education have closely mirrored traditional caste-ethnic hierarchies. Likewise, Shavit and Kraus (1990) show that in Israel, from the 1940s to the 1970s, the effects of ethnicity declined for the transition from primary to secondary schooling but remained constant for subsequent educational transitions. In China, considerable ethnic disparities persisted through the early 1990s, with progress toward equity at the stage of primary entrance offset by increasing disparities at the junior high-school stage (Hannum, 2002).

The effects of educational expansion on ethnic inequalities in occupational status are also mixed. In Brazil, Telles (1994) showed that industrialization and educational expansion were associated with decreased racial inequality across the full occupational distribution, but greater racial inequality in pro-

professional and white-collar sectors. In northwest China, Hannum and Xie (1998) also found ambiguous implications of educational expansion for ethnic differences in occupational outcomes. Over an eight-year period, rising ethnic disparities in occupational status could be explained by rising ethnic differences in education. These educational disparities emerged at a time of dramatic improvements in access to schooling for both minorities and ethnic Chinese. Similarly, in South Africa, despite educational expansion, educational disparities played an important role in maintaining race-based differences in occupational status in the 1980s (Mickelson et al., 2001) and 1990s (Treiman et al., 1996; Powell and Buchmann, 2002).

In short, while educational expansion offers new economic opportunities to both advantaged and disadvantaged groups, its implications for reducing inequality associated with socioeconomic status, gender, and ethnicity are decidedly mixed. While human capital disparities can be an important cause of occupational and income disparities across social groups, there are often important structural causes as well. As education becomes more central to occupations and incomes, those who are otherwise able but lack appropriate credentials are excluded, while those who gain credentials later may have a harder time converting credentials into high-status or high-wage employment. However, to maintain a balanced perspective on these findings, it is important to bear in mind that continued relative deprivation loses some of its significance if absolute deprivation is eased significantly by educational expansion.

## EDUCATION AND HEALTH

*Countries with better-educated citizens have healthier populations, as educated individuals make more informed health choices, live longer, and have healthier children.*

Across many fields of research, there is evidence of important linkages between education and health. Recent cross-national research has shown that the education of children, especially girls, is associated with significantly longer life expectancies and lower death rates (Hadden and London, 1996; Buchmann, 1996; Schultz, 2002). According to the within-country, over-time estimates provided in Table 1, a 10 percent rise in primary enrollment ratios is associated with an average 0.9-year increase in life expectancy; a 10 percent increase in secondary enrollment ratios relates to an average one-year increase in life expectancy; and for tertiary enrollment ratios, the figure is 0.7 years (column 3). Similarly, increases in enrollment ratios at all levels are associated with significant reductions in infant mortality per 1,000 live births (column 5).

Abundant empirical research indicates that more educated individuals live longer and healthier lives. The mechanisms determining this relationship are complex. An emerging sociological literature linking education and health in the United States emphasizes the key mediating roles played by psycho-social factors such as level of personal control, sense of agency, self-concept, and stress (Williams, 1990; Williams and Collins, 1995; House et al., 1994;

Mirowsky and Ross, 1998; Ross and Mirowsky, 1999). Unfortunately, little such research exists in developing country settings. Instead, most research in developing countries examines mechanisms linking women's education to infant and child health. This research suggests that women with more education are more empowered to process information about health and negotiate better health care.

For example, studies have shown that, compared to uneducated mothers, educated mothers are more informed about preventive health-care practices such as immunizations; have greater decision-making power in health; are less fatalistic about disease; and are more likely to adopt innovative behaviors related to children's health (Jejeebhoy, 1996; Cleland and van Ginnekin, 1988). Figures 2 and 3 report children's mortality and immunization rates by mothers' education level in countries with recent Demographic and Health Surveys (hereafter DHS) data.<sup>8</sup> For nearly all countries represented, children of better-educated mothers have lower mortality rates and higher immunization rates. While these graphs only present bivariate relationships, the relationship between maternal education and child health appears across empirical studies that employ controls for other dimensions of socioeconomic status (see reviews in Jejeebhoy, 1996, and Schultz, 2002).

#### EDUCATION AND DEMOGRAPHIC CHANGE

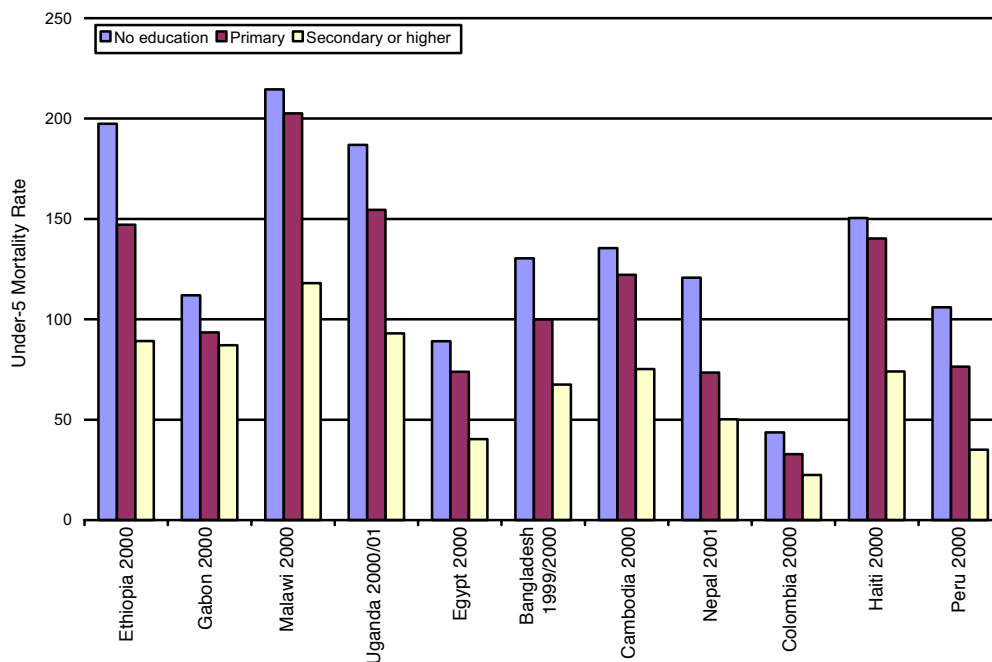
*The populations of countries with more educated people grow more slowly, as educated citizens are able to implement a virtuous cycle of having fewer children.*

The association between education and fertility is well established. Based on recent data for countries with DHS surveys, Figure 4 shows the average number of children born to women ages 40–49 by educational attainment. These graphs show a dominant pattern in which women with education, and especially secondary and higher education, tend to have substantially fewer children by the end of their childbearing years. The negative relationship between education, particularly secondary education, and fertility is also evident in national aggregate data. Estimates in Table 1 indicate that a 10 percent expansion in primary gross enrollment ratios leads to an average reduction in the total fertility rate of 0.1 children; the corresponding increase in secondary enrollment ratios is associated with a reduction of 0.2 children (column 4).

Why do these patterns emerge? First, the benefits of maternal education for child health come into play (London, 1992; Subbarao and Raney, 1995). Improved rates of infant and child survival enable parents to plan their family size and, therefore, contribute to declines in fertility. A higher infant survival rate may also extend the period of lactation and postpartum infecundability, thus reducing the time women are at risk of conceiving additional children. Using data from twenty-three African countries, Kirk and Pillet (1998) show that countries with higher rates of female schooling and lower child mortality experienced substantial reductions in fertility and desired family size.

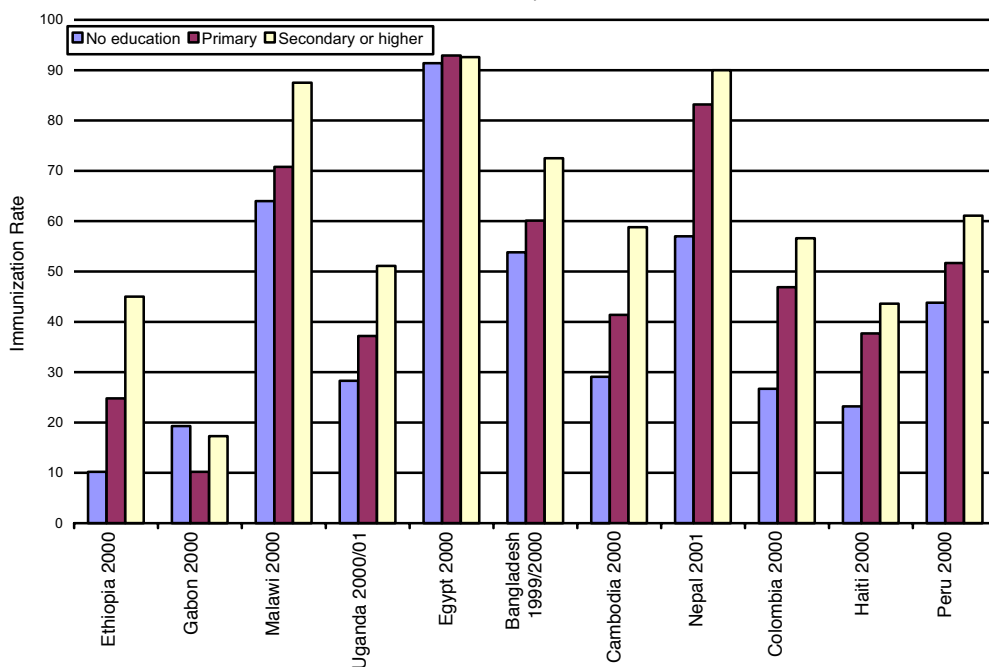
8. We present data for countries that collected data in 2000 or later. Armenia and Turkmenistan both had surveys in 2000, but are excluded from our figures due to apparent data problems.

Figure 2: Under-5 Mortality Rates in 10 Years Preceding Survey by Mothers' Educational Attainment, DHS Countries with 2000 or Later Survey Dates



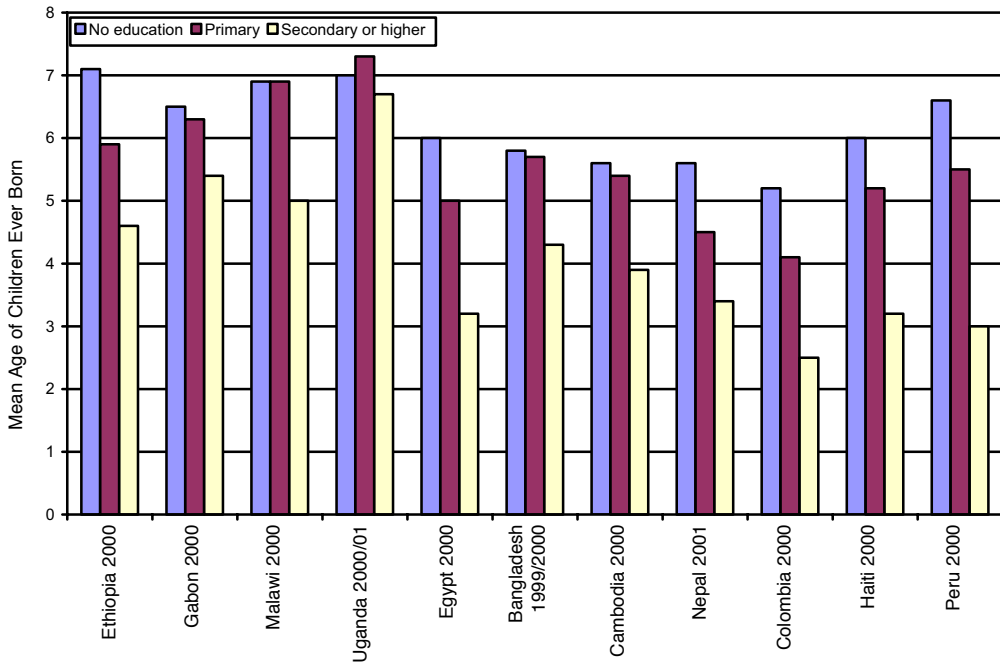
Source: Created from data in MEASURE DHS+. ND. "Demographic and Health Surveys Stat Compiler" <<http://www.measuredhs.com/data/indicators/>>, accessed June 2002.

Figure 3: Immunization Rates by Mothers' Educational Attainment, DHS Countries with 2000 or Later Survey Dates



Source: Created from data in MEASURE DHS+. ND. "Demographic and Health Surveys Stat Compiler," <<http://www.measuredhs.com/data/indicators/>>, accessed June 2002.

Figure 4: Mean Age of Children Ever Born to Women Ages 40–49 by Educational Attainment, DHS Countries with 2000 or Later Survey Dates



Source: Created from data in MEASURE DHS+. ND. “Demographic and Health Surveys Stat Compiler” <<http://www.measuredhs.com/data/indicators/>>, accessed June 2002.

Second, education encourages a later age at marriage (Jejeebhoy, 1996). This effect emerges not only through direct competition between enrollment in school and marriage. For example, Weinberger’s (1987) analysis of World Fertility Survey data indicated that the mean age at marriage was four years later for women with at least seven years of education than for uneducated women. In a study of five Asian societies, Hirschman (1985) showed that women’s schooling had a strong effect on the timing of family formation, with the largest effect at the secondary level. Delaying marriage carries significant potential for reducing population growth, even in the absence of motivation for reducing family size. Later marriage typically increases the mean length of a generation, or the time a cohort takes to replace itself, and thus slows population growth even at constant fertility levels.

Third, in cases where women have more opportunities to engage in higher-status, better-paying jobs (often as a direct result of higher levels of education), the opportunity costs associated with childbearing and childrearing rise, and the time available for parenting decreases. Because access to non-familial employment expands with higher levels of education, better-educated women are more likely to delay or eschew childbearing.<sup>9</sup> Evidence from twenty countries participating in the World Fertility Survey showed that female participation in the labor force had a strong, independent effect on fertility (Rodriguez and Cleland, 1981).

9. Of course, as noted above, the degree to which the extension of educational opportunities to girls translates to gender equity in the labor market varies across societies.

Moreover, with education and labor-force participation, women's status and decision-making authority may increase. This change relates to fertility in two ways. Women's increased decision-making authority is associated with greater utilization of health resources and improved child health (Dyson and Moore, 1983; see Jejeebhoy, 1996 for a review). Improved child health, in turn, provides the basis for limiting fertility. Also with increased decision-making authority, women are better able to implement fertility preferences. For example, in nine Latin American countries, while fertility preferences varied little across education levels, achieved fertility levels varied substantially (Castro Martin and Juarez, 1995). In Vietnam, better-educated women (and women with better-educated husbands) were more likely to use contraceptives (Dang, 1995). Similarly, in sub-Saharan Africa, Lloyd and colleagues (2002) find that the onset of mass education, defined as the point at which 75 percent of 15–19 year-olds completed at least four grades of school, was linked to increased contraceptive practice.<sup>10</sup>

A fourth route of education's influence on fertility lies in the effects of children's education on household structures and subsequent parental decisions about fertility. Caldwell (1980) identifies several mechanisms by which children's schooling affects the household economy. Education creates a dependency of children upon parents. Rather than all family members contributing to the family economy, parents become responsible for supporting children for longer periods of time. Education increases the direct costs of raising children through school costs and increased pressures on parents to invest in their children. Finally, education reduces a child's availability for working inside and outside the home.

For all of these reasons, educational expansion may reduce fertility by reducing the economic benefits and increasing the perceived costs associated with childbearing. For example, Axinn's (1993) analysis of microdemographic data from a rural community in Nepal indicated that children's schooling exerted a strong influence on parents' subsequent fertility preferences and behavior. Ogawa and Retherford (1993) cited concerns voiced by women in a national family planning survey in Japan about the economic and psychological costs involved in educating children as an indication of the likely importance of such considerations in fertility decisions.

Finally, because education systems serve the wider need of the economy instead of the values of family production, educational expansion speeds cultural change and creates new values (Caldwell, 1980). New values might include occupational aspirations beyond the household and increasingly individually-oriented rather than family-oriented goals. Even the values of individuals who do not themselves attend school may be modified. In Nepal, Axinn and Barber (2001) show that childhood proximity to schools dramatically increased women's contraceptive use in adulthood: women who lived

10. Note that innovative behavior is not always demographically favorable. Education can lead to unfavorable demographic outcomes such as the erosion of traditional norms regarding postpartum sexual abstinence or breast-feeding, thus contributing to increased fertility (e.g., Oni, 1985). Further, some scholars have warned that education may also confer more liberal attitudes toward high-risk behaviors and thus indirectly increase the incidence of HIV/AIDS (Krull, 1994).

near a school during their childhood had a 39 percent higher annual odds of adopting a permanent contraceptive method, given that they had not already done so. This finding was largely independent of whether the woman subsequently attended school, her husband attended school, she lived near a school in adulthood, or she sent her children to school.

Together, the many pieces of evidence linking education to differences in fertility lead to the expectation that educational expansion contributes to long-term favorable demographic changes and, ultimately, slowed population growth. Using data from Tunisia, Sudan, and Austria, Lutz and colleagues (1998) illustrate the significance of links between education and demographic change by including fertility and mortality differences by education in their population projections. The authors conclude that under the conditions of large age differentials in educational attainment and the significant education-related fertility and mortality differentials that characterize many developing countries, the inclusion of education in population projections significantly impacts population size. Their projections indicate that short-term investments in education will produce long-term effects on population size.

#### EDUCATION AND POLITICAL CHANGE

*Countries with more educated populations are more democratic, as their citizens are able to make more informed political decisions.*

In the debate over the “requisites” of political democratization, education is just one of many factors deemed important. Research has also examined the role of economic factors (economic development, income inequality, dependence on foreign aid, position in the world economy) and noneconomic factors (ethnic heterogeneity, experience with colonialism, religious orientation) as they relate to the rise and stability of democratic institutions. While many scholars have emphasized the positive role of educational expansion in facilitating political development, there are fewer empirical analyses of the impact of educational expansion than there are analyses of these other potential factors (Benavot, 1996: 377).

Of the research that has investigated this issue, two theoretical perspectives offer somewhat different views on the processes linking education with democratization. The political modernization perspective sees a strong causal linkage between an educated citizenry and democracy. Schools produce “modern” individuals who have a greater desire and ability to participate in political decisions and national concerns (Inkeles and Smith, 1974). Indeed, early cross-national studies (Lipset, 1963; Cutright, 1969) found strong correlations between mass literacy and the presence of democratic political systems, as well as between the expansion of primary education and degree of political development. In their survey of six countries, Inkeles and Smith (1974) showed that people with more schooling tended to be more individualistic, more informed and activist-oriented, and less parochial than those with little education.

Of course, one weakness of these studies was that their emphasis on correlations said little about the issue of causality. Later studies that approximated a longitudinal design through the use of panel data reported more ambiguous results. According to the political modernization perspective, the “aggregate effects of mass education expansion on democracy are largely achieved via education’s socializing influences on individuals” (Benavot, 1996: 384). Moreover, this view assumes that education has linear effects on individuals that are beneficial for the development and retention of democracy (Kamens, 1988).

The institutional perspective on the relationship between education and democracy differs markedly from that of modernization theory. First, in contrast to modernization arguments, the institutional perspective focuses on the macro-level impact of educational expansion. Educational systems are part of a broader process in the social and political construction of society, in which highly institutionalized social roles and categories are created and legitimated (Benavot, 1996: 385). Thus, educational expansion affects the political development of society not only through its impact on individuals, but also through the wider meanings attributed to given levels of educational attainment. Meyer (1977) refers to this as the “chartering” role of education, and suggests that the organization of education may have as important an effect on political development as the expansion of education. Moreover, whether or not education is beneficial for the development and retention of democracy depends on how educated elites are incorporated into the political system of a nation. In societies where graduates of tertiary education become representatives of the nation-state, the result may be a decline in the independent authority of other collectives (Kamens, 1988: 119). For example, Ramirez and colleagues (1973) found that the level of political incorporation of higher education had statistically significant negative effects on the introduction and retention of democracy between 1950 and 1968.

These perspectives also differ in their views regarding how expansion of different levels of education should influence political development. Political modernization views all levels of schooling as beneficial for the building of democracy, but emphasizes mass schooling — primary and secondary levels — as most important. For reasons explained above, institutionalists emphasize the importance of tertiary education.

The results presented in Table 1 do not resolve this debate, but they indicate a positive relationship between education and democracy. The final two columns of Table 1 show regressions of two commonly used scales, political rights and civil liberties, taken from Freedom House scores (Freedom House, Inc., 2000). Both primary and tertiary enrollment ratios have significant, positive effects on both indicators of democracy, with much larger effects at the tertiary level.

Benavot (1996) provided a more sophisticated examination of the consequences of educational expansion at primary, secondary, and tertiary levels for

four measures of democracy prevalent in the literature.<sup>11</sup> He investigated the effect of educational expansion over two periods (1965–1980, 1980–1988), controlling for economic development, colonial heritage, date of independence, ethnic homogeneity, and region, and found no impact of educational expansion on political democracy in the early period. In the 1980–1988 period, educational expansion at the tertiary level had strong positive effects on both measures of political democracy available for that time period, while primary and secondary expansion had negligible effects on the same measures. Benavot contends that the contrast of these results with earlier studies (that find positive effects of lower levels of schooling on democracy) is due to the superior methods and data used in his study.

At the individual level, abundant research from a wide range of contexts shows a strong relationship between education and political participation (Almond and Verba, 1963; Inglehart, 1977; Nie et al., 1979). Most of this research focuses on mature democracies where citizens have rights to participate in political processes through voting and opposition or protest. Studies show that educated citizens are more likely to vote (Nie et al., 1996) and voice more tolerant attitudes and democratic values.<sup>12</sup> The assumption is that schools are responsible for transmitting these outlooks; but exactly how schools promote these outlooks is unclear (Chabott and Ramirez, 2000; Benavot, 2002). Some arguments emphasize curriculum (Torney et al., 1976); others stress the institutional influence of the school (Meyer, 1977; Kamens, 1988).

Several caveats regarding research on the relationship between education and democracy are noteworthy. First, many of the studies that attempt to measure individual political views and values use paper and pencil tests to determine democratic orientations. It is possible that more educated individuals are better able to guess the “appropriate” answers to questions about political norms. This possibility raises questions about the nature of the relationship between education and political orientations. Second, the rapid expansion of education in the absence of growth in labor-market opportunities may create a crash in returns to schooling. Certainly the presence of educated, unemployed youth may have a negative impact on political stability (Huntington, 1968; Lipset, 1985).

Finally, it is very important to consider the content of education. For example, pre-reform-era China offers an important example of a context in

11. The four measures capture slightly different elements of democracy, but are highly correlated. The index designed by Ken Bollen (1980) captures the extent of political liberties and popular sovereignty and is considered highly reliable and valid cross-nationally. The measure designed by Zehra Arat (1991) captures four dimensions of democracy: degree of popular participation in political decision-making, the lack of restrictiveness in the franchise, the degree of competitiveness in the political system, and the extent of civil liberties. A third measure, developed by Tatu Vanhanen (1990) combines a measure of political competition (the smaller parties' share of votes in either parliamentary or presidential elections) and the degree of public participation (the percentage of the population that voted). The fourth measure of democracy is based on an annual cross-national survey coordinated by Raymond Gastile (1987) and sponsored by the Freedom House. In this measure each nation is ranked on two seven-point scales according to the extent to which political rights and civil liberties are respected.

12. The empirical evidence regarding the relationship between education and tolerance is mixed. For example, Weil (1985) shows that the relationship between individual level of education and degree of political tolerances varies across countries.

which dramatic expansions of “revolutionary” schooling were not characterized by obvious shifts toward political democratization, as conventionally defined in the West. Similarly, high levels of state control over tertiary education may undermine the support of democratic political institutions because, in such cases, graduates are more likely to become state civil servants and representatives of the nation-state.

## CONCLUSION

What does the diverse research reviewed here tell us about the likely consequences of universalizing primary and secondary education? Some of the expected relationships listed at the outset of this paper appear to be well-supported by empirical evidence. Most strikingly, substantial research attests to both the health and demographic benefits of improved educational composition: Countries with better-educated citizens tend to have healthier populations, as educated individuals make more informed health choices, live longer, and have healthier children. In addition, the populations of countries with more educated citizens tend to grow more slowly, as educated people are able to lower their fertility. Also convincing is evidence that the expansion of educational opportunities will enhance, but not necessarily ensure, the future economic security of the world’s most vulnerable children. Consistent results spanning many years and crossing disciplinary boundaries suggest that these benefits can be reasonably anticipated from further expansion of basic and secondary education.

In other areas, empirical support for the assumed benefits of education is more ambiguous. Considerable controversy surrounds the effects of educational expansion on national economic development. Many empirical studies find a positive relationship, but other studies cast doubt on it. Data limitations have often been blamed for the controversy, with respect to both errors in measures of schooling and the limited time spans of available data. In short, statements of the benefits of educational expansion for growth are still based on mixed evidence, as economic research has not established a consensus regarding findings or the best ways to address complex conceptual, methodological, and data challenges.

For other hypothesized consequences, contradictory lines of research have emerged in sociology and political science that have not informed the rhetoric of development organizations. For example, numerous empirical studies in sociology have indicated that while educational expansion tends to offer absolute benefits to disadvantaged groups, it is less likely to erode social inequalities rapidly, except perhaps for inequalities associated with gender. Inequalities associated with economic origins or ethnicity often prove resistant to educational expansion, as educational access may expand faster for advantaged than disadvantaged groups. In short, decades of empirical research in social stratification and mobility offer evidence that educational expansion does not necessarily narrow social inequalities between advantaged and disadvantaged groups.

Similarly, there is considerable controversy surrounding the effects of educational expansion on the democratization of societies, though expansions of primary and secondary education are likely to improve the informed citizenship of individuals. One obvious problem with this line of research relates to developing valid and reliable measures of democratization. An additional concern is that democratization, perhaps more so than other outcomes, may hinge directly on the hard-to-measure content of education. This possibility is suggested in studies that find larger effects of tertiary education than lower levels of education. Thus, the consequences of expanding universal basic and secondary education for political democratization remain an empirical question.

To understand why research in some of these areas remains inconclusive, four general points are worth considering. First, much of the research discussed above underscores the importance of a long-term perspective. The observed relationship between educational expansion and economic growth is stronger over longer time periods (Krueger and Lindahl, 2000). Studies also show echo-effects of parental education for children's human capital (e.g., Behrman et al., 1999; LeVine et al., 1991; LeVine et al., 2001), suggesting future economic payoffs for current expansions. Lutz and colleagues (1998) emphasize that ambiguities in the research on short-term national-level benefits of education may be attributable, in part, to the lag time between improving enrollments of children and changes in the overall human capital stock of the population. As data for longer time periods become available, ambiguities in the current research may decline as the ability to incorporate appropriate time lags into such studies improves.

Second, the expansion of different levels of education seems to have different consequences. For example, tertiary enrollments, in particular, appear to be significantly linked to democratization and technological change, while educational expansion through the secondary level appears to be extremely important for reaping many health and demographic benefits. These differences may be linked to qualitative differences in what individuals learn at these different stages in education.

Third, the "quality" of education, the organizational structures of education, linkages between education and the labor market, and the specific content of education all matter for assessing education's consequences. While this point seems obvious, at present, widely available measures of education systems and of schools are insufficient for revealing critical mechanisms that link education to various outcomes.<sup>13</sup> Very few studies incorporate these nontrivial elements of education into empirical strategies. There is an urgent need for the development of data collection strategies that allow more detailed empirical descriptions of what education means in different national contexts, and thus enable investigations of the attributes of education that facilitate hypothesized outcomes across a variety of realms.

This point is as applicable to data collected from individuals as it is to data collected about schools and school systems. Our understanding of the poten-

13. One recent review, for example, characterizes empirical evidence about the impact of subject matter or curriculum on social outcomes as "elusive" (Benavot, 2002: 68).

tial consequences of schooling could be much improved by knowing more about those aspects of individuals' skills that are enhanced by education. The concept of human capital stock has occupied a central role in research on educational expansion, but few researchers have tried to develop direct measures of the aspects of human capital thought to be most important. One way that research can make progress in this direction is through incorporating new literacy and life-skills assessments into studies of the consequences of education. The recent International Adult Literacy Survey (IALS) initiative (OECD and HRDC, 1997; OECD, 2000) is an important step toward developing international standards for measuring productivity-related skills. A parallel initiative sponsored by UNESCO explores how adult literacy, numeracy, and life skills can be best measured in developing countries.<sup>14</sup> The measures being developed through these initiatives seem particularly suited to the task of uncovering the links between education, skills, and the positive social changes that are of interest to development agencies. Combined with appropriate survey data, such measures would allow direct investigation of the competencies acquired in the school system, and their consequences for economic welfare, health and family change, and citizenship.

A final contributor to contradictory findings, and an important caveat even in areas where consistent results have emerged, is the point that educational impacts are sensitive to context. The human capital perspective implicit in much of the research on educational investments is inherently individualistic, assuming that education will offer the same enabling capacities to individuals regardless of the contexts in which they function. This perspective often fails to acknowledge that within the global economy, within nations, within local communities, and within school systems, social structures shape and constrain the impact of rising education. For example, effects of educational expansion on economic development may be conditioned by national political stability or by a nation's position in the global trade system. Within countries, the economic benefits to those educated later may be smaller than the benefits to those educated earlier, because as a national population's educational composition improves, the value of a given educational credential in the labor market declines. As education expands to reach individuals from increasingly disadvantaged or isolated groups, these individuals may have a harder time than others turning credentials into high-status or high-income employment. The health benefits of education may be more evident in societies where the sanitation infrastructure is weak, or less evident in societies with universal access to health care. These examples emphasize that educational expansion should be viewed as one of many important elements in social change. Reasonable forecasts of the consequences of extending basic and secondary education to the world's most disadvantaged populations need to consider the social structures in which these expansions will occur.

14. For a summary of key guidelines emerging from the UNESCO project, see ILI and UNESCO (1999).

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