World Expansion of Mass Education, 1870–1980

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Newly available enrollment data for over 120 countries for the period 1870–1980 are used to examine theories of mass educational expansion. Event-history analyses indicate that mass educational systems appeared at a steady rate before the 1940s and sharply increased after 1950. Pooled panel regressions show that the expansion of mass education, once formed, followed an S-shaped diffusion pattern before 1940, continuing with added force later. Expansion is endemic in the system. National variation exists; indications of national modernization or of structural location in world society, however, have only modest effects. It seems that mass education spreads in a world organized politically as nation-states and candidate states. Rates of appearance of mass education and of expansion accelerated sharply after World War II, with the intensification of the nation-state model and the centrality of mass education in this model.

Mass schooling has become a worldwide institution, both as a normative principle and as an organizational reality. The aspiration to achieve universal educational enrollment is found in virtually all national societies and is often written into their grounding constitutions (Boli-Bennett and Meyer 1978) and national laws and policies (Fiala and Lanford 1987). Opposition to mass schooling, an ideological stance well documented in educational histories (cf. Furet and Ozouf 1982; Maynes 1985, Melton 1988, Mueller, Ringer, and Simon 1987), has disappeared. By 1985, mass education was compulsory in 80 percent of the countries of the world (Ramirez 1989). The right to a free elementary education is enshrined in the United Nations’ Declaration of Human Rights (Article 26).

Mass enrollments have also expanded greatly. Over 90 percent of the world’s children spend some time enrolled in schools, and over 20 percent of the world’s population is enrolled in elementary or secondary schools (UNESCO 1987). National educational expenditures have increased and represent substantial proportions of total governmental expenditures. Even the poorest countries maintain primary school systems and receive financial assistance and moral support to do so from other countries and from international agencies (World Bank 1987).

The normative and organizational triumph of mass schooling has unfortunately not led to the critical assessment of earlier explanatory theories of mass education. This article addresses this issue. We start by reviewing the classic theoretical arguments in the field that are often functionalist accounts that stress variations in the internal characteristics of societies to explain educational expansion. Schooling, it is thought, expands either to

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1 By institutions, we mean “standardized activity sequences that have taken for granted rationales, that is some common social ‘account’ of their existence and purpose” (Jep- person 1991, p. 147).
solve problems of social order (through integration) or to maintain the dominance of elites (through co-optation). In both the mainstream and the critical variants of functional theory, the expansion of schooling is a solution to societal-level problems. Such arguments do not easily explain the worldwide character of educational expansion.

We argue that mass schooling made sense in so many contexts because it became a central feature of the Western, and subsequently the world, model of the nation-state and its development. Nation-states expand schooling because they adhere to world models of the organization of sovereignty (the modern state) and the organization of society as composed of individuals (the modern nation). This development took place earlier in political entities that served as the organizational carriers of the new world models, and thus in the new nation-states, rather than in the old dynastic empires. We further argue that the rise and expansion of mass schooling in colonies and dependencies is best understood as a function of their linkages to the world models and the extent to which colonies were organized as candidate nation-states. Thus, this argument situates nation-states within a broader world environment and seeks to explain educational developments within nation-states as a consequence of their exposure to the pressures of this environment to adhere to the nation-state model of political organization. Our argument, hence, is an instance of the more general institutional school of organizational analysis (cf. Meyer and Scott 1983; Powell and DiMaggio 1991; Zucker 1983).

We proceed with empirical analyses that use a new cross-national data set reported by Benavot and Riddle (1988). The data set assembles enrollment information for many countries throughout the world, from the late 19th century to 1980. The analyses focus on explaining the appearance of mass education throughout the world during this period and the expansion of primary enrollments.

BACKGROUND

The principles and practices of mass education appeared in the core north European countries and their settler offshoots—including the United States—in the century before 1870 (Maynes 1985; Tyack, James, and Benavot 1987). The nationally rooted state, secularizing earlier religious ideas and institutions, everywhere incorporated mass education as a main enterprise. The political construction of society as a consciously articulated progress-oriented project—an active participant in and object of public (usually state) action—was central, as was the construction of the individual citizen-member as the principal unit of society (for a detailed history of the process in Sweden, see Boli 1989).

Functionalist lines of analysis presuppose societies made up of people and activities that are systematically interconnected and oriented toward collective goals. These goals are thought to involve survival in traditional societies and progress in the literature in modern ones. The collective goals are thought to reflect consensus in a "social-order" variant of functionalist analysis, but are discussed as being driven by dominant interests in a "social-reproduction" variant. The models of nation and state within both variants are similar and clearly follow from the Western model of a national society (Hobsbawm 1983). Functionalist lines of analysis emphasize the systematic character of society as a natural phenomenon and explain mass educational expansion as reflecting the socialization requirements of the differentiated and industrialized society.

As social scientific theory, functional notions have flourished in the work of historians (Bailyn 1960) and sociologists (Drebben 1968). Despite much criticism, these ideas continue to buttress many explanations of the role of mass education, especially within the "education and development" literature (Psacharopoulos and Woodhall 1985). Theoretical critiques of the "social-order functionalist" perspective are well established (Berg 1971; Collins 1971, 1979), but the perspective persists and powerfully influences educational developments around the world.

Many criticisms of social-order functionalist thinking nevertheless retain a functionalist perspective. Societies are
still seen as autonomous functioning systems, but the functions emphasized are those that elites need and benefit from. Education is seen as maintaining discipline and order in a system controlled by dominant economic and political elites; it maintains the legitimacy and power of dominant classes (Bernstein 1973) and effectively controls the lower classes (Bowles and Gintis 1976). The emergence and expansion of mass schooling is conceptualized as a mechanism of social control necessitated by excessive vertical differentiation—itself brought about by the same forces of industrialization (and sometimes political dominance) discussed within social-order functionalism. An enormous amount of socialization efficacy is again assumed within what may be called this “class reproduction functionalist theory” of mass schooling. The theoretical weakness and empirical shortcomings of this line of thought are also well documented (Archer 1983; Boli, Ramirez, and Meyer 1985; Olneck and Bills 1980; Rubinson 1986).

Empirical researchers on mass educational expansion have grown skeptical of almost any version of functional theory. The evidentiary problem has been that much mass schooling emerged and expanded before industrialization in both Western Europe (Furet and Ozouf 1982; Maynes 1985) and the United States (Kaestle and Vinovskis 1980; Meyer et al. 1979). It arose later in industrialized Britain than in less-developed Scotland and Prussia and arose as rapidly in the American West as in the industrialized East. In analyses of the growth of primary educational enrollment after World War II, neither industrialization nor social organizational correlates as urbanization show substantial effects (see, for example, Meyer et al. 1977).

Political and cultural, as opposed to economic, variants of functional theories fare little better. Mass schooling appears to be compatible with both expanded (Prussia, Sweden) and limited (the United States) state administrative and fiscal powers and with a variety of religious traditions. The emergence and expansion of mass schooling occurs in similar ways, despite much variation in the supposed internal societal economic, political, and social predictors. Thus, we explore with much skepticism the potential impact on mass educational expansion of such internal societal predictors as urbanization; religious, ethnic, and racial composition; or state authority. The core hypotheses of all types of societal functionalism suggest these societal properties, and we make use of the best available indicators to gauge their effects.

Disenchantment with both lines of functionalist theory has led researchers in two sharply distinct directions. One direction has emphasized the concrete interests and structures involved in the creation of mass education, calling attention to the specific conflicts and competitions involved and to particular historical conjunctures and sequences at issue. Studies emphasize unique features of countries, such as the character of the Prussian bureaucracy, the status of the Swedish peasantry, the extension of the franchise to the English working class, or the greater significance of race than of class in the United States. There is an emphasis on the unique interactions or sequences of variables as determining distinctive outcomes in particular cases (Archer 1979). At a more general theoretical level, the importance of status conflict and competition in driving educational expansion has been stressed (Boudon 1974; Collins 1971, 1979). The net effect of these studies has been to undercut further the social-order and class-reproduction functionalist theories (see Melton 1988 for Austria and Prussia; Katzenelson and Weir 1985 for the United States).

These studies are important in their own right, as is research that examines, with longitudinal data, the development of schooling within a single country, focusing on sources of internal variations (see Hage, Garnier, and Fuller 1988; Barnhouse Walters, McCammon, and James 1990). But these studies do not systematically deal with cross-national variation and cannot directly confront theories that seek to explain educational expansion at the societal level of analysis (Rubinson and Ralph 1986). This article focuses on cross-
national educational data to address these theories directly, as well as the alternative argument we advance.

THE ARGUMENT

As an institution, Western mass education involves the following features: (1) It focuses on the socialization of individuals for membership in society. (2) It aspires to extend membership to all individuals within the society. (3) It articulates a secular vision of progress, in which action and achievement take place in this world, not in some transcendent cosmic. (4) It sets forth an increasingly standardized curriculum (Benavot et al. 1991). (5) And it putatively links mastery of the curriculum with personal development and the latter with the progress of the nation-state. It is not surprising that national setbacks or failures often result in reform movements in which educational reforms play a leading role. But it is difficult to bring these properties to terms with the immediate functional requirements of 19th-century social systems unless we recognize that what was involved was a growing adherence to a translocal cultural project, not just an adaptation to local social realities. This project was developed as such by the various elites who were its main advocates. It involved an ideological conception of a new society, incorporating all individuals in a unified and progressive collectivity that would successfully operate in a real world as a nation-state, whether organizationally centralized or not (Anderson 1983). The relationship of mass education to the nation-state is, of course, a central insight in the pioneering comparative studies of Marshall (1948) and Bendix (1964). We accept this insight, but reformulate it to go beyond both the conjuncturalist and society-specific nuances of their work. From our perspective, the nation-state itself is a transnational cultural model within which schooling the masses became a major mechanism for creating the symbolic links between individuals and nation-states.2

If we consider mass education as a central feature of an articulated cultural project, we can better explain its early history: Mass schooling appeared where the nation-state model appeared, often despite some society-specific realities. We can also better explain its later spread: The core models involved were culturally dominant in the world throughout the period, ensconced in every important social theory and ideology. Every local state that was either driven to or choose to enter the competitive social, economic, and cultural system involved (the United States is an early example) adopted these models, often in their highest forms, at least as abstract policy (Meyer 1980; Thomas et al. 1987).

In sum, mass education became a core component of the nation-state model. Its collective standardization celebrates the unified sovereignty and purposiveness of the collectivity (the state), its individual focus and universality enact the integrated and universal character of society (the nation of citizens), and its secularized culture defines the character of the nation-state as an enterprise that is designed to attain progress. From this point of view, mass education is not primarily an adaptation to societal realities of function and power. It arose as nation-states and candidate states affirmed, enhanced, and thus legitimated nationhood within the broader Western civilizational network (Boli et al. 1985; Meyer, Boli, and Thomas 1987; Ramirez and Boli 1987). The wider world environment and its models of the legitimate political organization must be central to the explanation of the striking similarities in the expansion of mass schooling across widely varying national circumstances.3

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2 A similar but more general view is found

3 Our argument resonates with Anderson’s (1983) conceptualization of “imagined communities” and with Furet and Ozouf’s (1982,
We thus argue that the expansion of mass education around the world is dependent on the formation of unified sovereign projects that are linked to and recognized by the wider world society of nation-states and the formation of internal principles of nationhood within countries. Since both the nation-state principle and the linkage of mass education to it have gained intensity over the past century, we expect rates of penetration and expansion of mass education to have increased over time.

In the present analyses, then, we contrast empirically the effects on the expansion of mass education around the world of the classic societal-level indicators emphasized by the functional theories with other indicators of the expansion and spread of mass education as part of the development of the project of the nation-state. We examine changes over time in the world context and variations among countries in links to this context and to its models of a national society. Our aim is to develop a better sense of the rise of a world in which mass education of a particular type has become practically universal.

THE DATA

Dependent Variable

To describe and analyze the expansion of mass educational enrollments in countries around the world from 1870 to 1980, we employ data assembled from many sources and reported by Benavot and Riddle (1988). The self-consciousness of nations about the virtues of mass education led, even early, to an emphasis on record keeping and on reporting enrollment statistics. This process was by no means true of earlier educational ventures in the European world sphere or elsewhere. Analogous to the rise of census taking, ideological views that society is made up of persons who matter and whose socialization matters to the calculable benefits of society fostered an emphasis on enrollment statistics. At least since the early 19th century, data were assembled by national and imperial bureaus and were reported internally and later to international groups, conferences, and statistical agencies. Much of this data gathering and reporting were undertaken for the comparative purposes of competition, emulation, and the tracking of world progress. Since World War II, UNESCO has systematically collected data for all the countries of the world as well as for the colonies. Before then, the League of Nations and other international bodies made similar efforts. For these earlier periods, available compendiums (Banks 1975; Flora 1983; Mitchell 1980, 1982, 1983) provide many enrollment statistics, but other sources (such as the reports of the Colonial Office of Great Britain 1890–1940) provide additional information. (For a complete list of sources of the present data, see Benavot and Riddle 1988.)

The basic data consist of the number of students who were reported as being enrolled in primary school. Secondary enrollments were very small in the earlier decades of the analyses, and when they became significant, were kept clearly separate in national reports. We do not know how many of the enrolled students actually attended school or for how many hours or days a year schools were in session. But formal enrollment itself is a significant indication of the establishment or formation of a national educational system. The data include public and private school enrollments. Early statistical reports tended to be clear in their conception of what was and what was not a school and included only organizations that incorporated educational arrangements that one might consider “modern.” Traditional religious or local cultural schooling, as in Islamic countries or in several Asian countries, such as China, Japan, and Korea, was, practically speaking, neither counted nor reported by the professionals and bureaucrats who were concerned with managing “education.” This omission is itself an important indication of the special rationalized and projectlike character of modern education throughout the world. Instruction was kept track of,
and seen as relevant to the nation and the world, only if it aspired to the modern form.

To use enrollment statistics, it is necessary to establish a reasonable denominator, so we can calculate the proportion of the eligible students who were enrolled. Doing so is something of a problem. First, enrollment statistics are available for more countries than are reasonably good census data that classify people by age. Second, it is often not clear exactly how many years of schooling constituted the appropriate primary educational cycle. For recent decades, both problems can be partially solved because reasonably detailed national censuses and UNESCO records that define the length of the primary cycle in each country are available. These data are less commonly available for the periods before World War I.

Benavot and Riddle (1988) built several sensible compromises into the data set we use. First, all primary enrollment data were standardized to an estimate of the national population aged 5–14. In practice, most countries have had primary cycles of about six years, with decreasing variation around this standard over time. Thus a realistic maximum enrollment ratio is about 70 percent. Some countries, especially in the earlier decades, had longer primary cycles in principle, but low proportions of students were enrolled in the later years of the cycle in a typical country. Hence, the errors introduced are almost certainly small. In any event, much enrollment—particularly in developing countries with newer educational systems—tended to pile up in the first years of primary education, with much repetition, so this may be the most reasonable procedure.

Second, when a detailed census estimate of the 5–14-year-old population was not available, an estimate was made by (1) applying a constant fraction to the overall population or (2) interpolating from census data for surrounding periods (see Benavot and Riddle 1988 for the exact procedures). Errors introduced by these procedures are likely to be small, given the great variation in enrollments. Since errors are likely to be reproduced over time for a given case, their effect on longitudinal analyses is likely to be reduced.

The major problems with the data set are not in the inaccuracy of the numbers available, but in the systematic character of the numbers that are not available. Countries with low enrollments were unlikely to report statistics, and the process that generates mass education turns out to involve the creation of official statistics, too. Thus, the data set is biased against cases with little mass education. For instance, even though it was common in the late 19th century for more peripheral countries or colonies to have no mass education, we have no case in which no mass education was statistically reported. We can correct a little for this bias in case selection by including (with a value of zero) earlier data for countries for which we have later data indicating that this is appropriate, that is, enrollments were near zero. But doing so fills in few of our missing data points. In our analyses, we make a substantive issue out of this methodological one and approach the matter directly.4

Independent Variables

Properties of a national “society.” It is difficult to find variables that capture some of the themes of the functionalist literature covering the whole 1870–1980 period. In the later part of the period, more variables are available (see the analyses in Meyer et al. 1977). We have assembled a few variables that cover most cases of countries, but data are inevitably incomplete. The following indicators are used to reflect characteristics of societies that have been argued to play a role:

- Urbanization (proportion of the population in cities over 100,000) is a main indicator of social and economic development, and one of the few that is available to cover a long period. It is

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4 A list of the present countries of the world and the time points, running to 1870, for which we have enrollment data or estimates for each country, is available from the authors.
highly correlated with such other indicators as per capita gross national product or energy consumption per capita, but is available for many more countries and periods. Data are coded as of the beginning of each decade of the analysis. In addition to the explicit data sources we use, any country with a known score of zero for a period is given the same score for all earlier periods, which reflects that urbanization has declined almost nowhere in the past century. (Sources: Banks 1975; UNESCO 1987.)

- Religion (the percentage of the population who are Christian) is an indicator of the dominance within societies of the sorts of modern values that are often thought to be associated with widespread literacy and mass education (see, for example, Stinchcombe 1965). The data are taken for a single point in time (1900), but this variable has a high autocorrelation over time, and more precise measures of denominations or religiosity would change little. (Sources: Barrett 1982; Central Intelligence Agency [CIA] 1987.)

- Independence (a dummy variable indicating independent versus dependent or colonial status) is an obvious indicator of political development. Mass education, it is often argued, is a creature of this development, which requires a mobilized and socialized population. (Sources: Banks 1975; Mitchell 1982, 1983; Statesman’s Yearbooks [for various years]; Wilkie and Perkel 1985.)

- The presence of a national rule of compulsory education (a dummy variable) is taken to indicate the extended authority of the state in the educational domain. Mass education is generally thought to reflect the rise of state authority as an organizational matter. Previous research (Soysal and Strang 1989) suggested that the variable is not itself influenced by the growth in enrollments. (Sources: UNESCO 1955–71, supplemented by data from various national sources.)

- Race (percentage of the population who are Caucasian), in the explicitly racist world of the late 19th and early 20th centuries, is an obvious indicator of cultural and political standing. In many areas, Whites were functionally inte-

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grated, and non-Whites were peripheralized. For instance, in the 19th century, the American states with substantial non-White populations avoided compulsory education and slowed their educational expansion (Tyack et al. 1987). It seems likely that countries with primarily White populations would show more educational expansion. Since racial composition is highly autocorrelated over time, we characterize countries at a single time point, mainly 1900. (Sources: Barrett 1982; CIA 1987.)

- Ethnolinguistic fractionalization is a conventional measure of likely intergroup competition in relation to such goods as education. In functional theories, it is suggested as an indicator of functional needs for education as a mechanism of integration. In status-competition theories of educational expansion (see, for example, Collins 1971, 1979), it can be an indicator of the intensity of intergroup cultural competitions. In both lines of thought, high fractionalization may be expected to generate more rapid educational expansion. Autocorrelation in the variable is very high, so the variable is treated as constant over time in our analyses. (Source: Taylor and Hudson 1971.)

A Typology of Polity Linkage to World Models

A main research aim is to contrast the effects of the sorts of internal variables just defined with those of a country’s links to the modern world polity of nation-states. The fundamental hypothesis is that countries that are closely linked to this system through organizational dependence or through membership and competition are likely to develop mass educational systems, independent of local social conditions. Two crucial elements are involved. First, the external linkages of a country work through the establishment of a principle of unitary membership (or direct or dependent modern sovereignty) in the central organization, which takes on modern statelike forms. Second, such close linkages bring to a country the project of nation building, the principle of reconstructing the masses into na-
tional citizens. When one discusses the incorporation of territories in the world into this system, organizational independence is not a crucial element: Models of state and nation commonly derive from colonial dependence (Anderson 1983), as well as from independent membership in the world system.

By the end of World War II, models of the construction of integrated modern sovereignty and of modern national society were spread almost everywhere, though the principle of organizational autonomy was still contested. The crucial period that requires the construction of a typology for our research is 1870–1940—the period in which much variance in the growth of enrollments needs to be explained. Indicators are not developed in the literature. To proceed, therefore, we constructed a simple typology of a country’s structural location vis-à-vis the world polity (Meyer 1980) during that period. First, how closely was the country tied to the world polity and exposed to its models of integrated sovereignty or state formation, through direct independent involvement or through close organizational linkages? Ideally, we would like indicators of the extent of clarity and consensus in the world about the existence and political unity of a territory, about the legitimate authority that was sovereign over it, and about the membership (and status) of this sovereign authority in the wider world.

Second, how closely was the country tied, through sovereign-constructed models of nation building, to the models of society that were dominant in the world polity? At issue is the degree to which a political entity was institutionalized as an actual or projected nation-state operating in a world of nation-states. Ideally, we would like indicators, such as the existence of maps of a territory; censuses of populations; legal regulations extending down to villages and individuals and covering many sectors; and economic, tax, and monetary systems and accounts of a similarly penetrating character (see Boli et al. 1985).

We distinguish types of countries—lacking the resources to create a typology with detailed country-level information—on these joint axes:

At one end of the continuum, of course, is the core itself (1): the northern European and Anglo-Saxon countries (19 cases). In these countries, the formation of modern sovereignty and the principle of nationhood are high. In fact, high enrollments preceded our period of analysis, and few cases enter the data set we analyze. But we clearly expect the rapid expansion of enrollments in this category.

Next come a series of types of countries with close links to the central models and with substantial societal penetration by models of nation building:

Peripheral independent Western countries (35 cases). Clearly part of the nation-state system are more peripheral countries in southern and eastern Europe (2) and Latin America (3). In these countries, links to world models of sovereignty are lower and nation-building efforts are less developed than in the core. But on both dimensions, these countries are clearly embedded in the system, and we expect the expansion of enrollments to be rapid, although it might be less so for Latin America, at least until after World War II and the rise of extensive internal mobilization.

Core colonies and dependencies (4) (of Britain, France, and the United States: 52 cases). We refer here to colonies of core countries that were located outside the Sub-Saharan region (which was, during much of the 1870–1940 period less tightly organized by real colonial states that attempted national penetration and construction). The cases we examine are mostly in North Africa, Asia, and the Caribbean. Our argument—which differs from others—stresses the relatively close linkages of these countries to world centers and their models and the consequent efforts at colonial national construction (such as by the British Colonial Office). We expect these cases to show much greater educational expansion than classic functional theories would predict. Our emphasis leads to the expectation that links to dominant world centers, combined with aggressive center-legitimated nation-building efforts, produced much earlier educational
expansion than would be predicted by local economic, racial, independence, or religious status. Arguments that stress the interests of core powers in the maintenance of simple domination would also not lead to this prediction. We argue that core domination results in the rapid incorporation of core ideological models. The examination of early British imperial attempts at national construction in particular led to our conceptualization of this category. The history of American efforts in the Philippines and in Puerto Rico led to the same conclusion.

Long-term non-Western independents (3) (8 cases). A small number of independent polities outside the Western system entered this system and competitively mobilized during the period (Strang 1990). Japan is the most commonly discussed case, but Turkey, China, and Korea are also noted. These polities were linked to world centers through competitive processes during the period and attempted reactive mobilization and nation building. We expect educational expansion in these countries, given their internal and external struggles to compete in the wider world system.

Other categories of countries were much more distantly connected to the world society and its models of state and nation building during the 1870–1940 period:

Core (British [6] and French [7]) Sub-Saharan colonies (35 cases). These cases were much less closely linked to world centers, given their systems of indirect rule in the earlier colonial decades. Centralized sovereignty was less likely to appear, as were nation-building efforts, though the latter are more visible in the British than in the French cases. We expect low levels of educational expansion in these countries.

Peripheral (8) (Spanish and Portuguese) colonies (13 cases). These cases were distantly linked to the world centrality and were unlikely to experience aggressive nation building by metropolitan powers that did little at home, either. We expect the low levels of educational expansion in these countries.

Far peripheries (9) (15 cases). During this period, a number of countries (such as Ethiopia, Kuwait, and Mongolia) although in some sense independent, were so far removed from the world models of either state or nation building that we may expect little expansion of enrollments.

RESULTS

The Existence of Enrollment Data

The existence of information on enrollments for a country turns out, as was noted earlier, to be related to the existence and expansion of mass education itself. Countries with no primary enrollments to report—and there were clearly many such countries at the beginning of our period—did not report data on the subject. And it seems that data were more commonly reported and available when enrollment rates were high. Mass education and its reporting system go together, a situation that poses some problems for our analysis.

We examined, for each category of our typology of polity linkage to world models, the proportions of countries that reported enrollment data for each period. By 1980, data were reported for the great majority of countries in every category (92 percent overall). But in the early decades, there were few data in most categories. The polity categories fall into a rough sequence in data reporting—a sequence that may tell not only about the availability of information, but about the spread of mass education itself.

First come the core countries, most of which (89 percent) reported data in 1870, followed by the more peripheral independent Western countries, which entered the data set in 1880 (59 percent reporting) and in 1890. Then come the main colonies and dependencies of the core powers, which tended to enter around 1900 (58 percent reporting). The non-Western independent countries entered around 1910 (50 percent reporting), and the British and French Sub-Saharan colonies tended to enter around 1920 or 1930 (51 percent reporting). Finally, the peripheral colonies entered the data set around 1950 (62 percent
reporting), and what we have called the far periphery entered the data set only around 1960 (with 87 percent reporting). A country’s appearance in the data set, in other words, follows the spread of the principles of sovereignty and nationhood around which our typology is built. Time differences in entry into the data set are extreme.

So much missing data, and the obvious relation of missing data to the absence of mass education itself, poses methodological problems for our later analysis of the expansion of enrollments and may lead us to overemphasize the universality of this expansion. It also poses problems for our analysis of the early origins of mass education in countries, since without data reporting the absence of enrollments, we have no direct information on transitions from no mass education to some mass education. Furthermore, many countries, when they first entered the data set, reported substantial enrollment rates, which clearly developed over substantial periods. Practically all the core countries, for instance, already had high enrollment levels in 1870, when the data set begins. Many other countries entered later with high enrollment levels.

For a subset of countries, however, our data on initial enrollment rates indicate low enrollment levels, suggesting that we are close to the point of origin of the system. This possibility is strengthened by the fact that, as we observe later, growth was endemic in the primary education systems of the world during the period under study. In an exploratory way, we can consider initial reports of low enrollment levels as indicating a point of origin.

**An Exploratory Analysis of Origins**

As was noted earlier, nothing can be said from our data about the entry of most countries into the world of mass education. First, 30 countries already reported relatively high enrollments (over 10 percent of the 5–14 age group) by 1870, including practically all countries that are now considered developed. Second, 81 countries entered the data set only later, but with a first recorded rate of enrollments above 10 percent. This rate appears to be high enough to indicate that the aspiration to establish mass education had probably been present for some decades. But for 71 countries, the first recorded value for an enrollment rate is below 10 percent. This is a small-enough figure to make at least plausible the assumption that these countries had recently acquired the purposes and arrangements of mass education. We explore this possibility by analyzing rates at which such countries entered the world of mass education and the factors affecting this entry. Of course, the data set is far from a reasonable sample, and the assumption of recent entry is plausible but not certain. But, we submit that the results are interesting and add to the understanding of the formation of mass schooling.

**Time.** In Table 1, we show the rate at which the countries in this subset entered the system (that is, appeared with reported enrollments below 10 percent) over time. In each period the proportion of the available cases that entered is reported. This itself is a number that perforce declines over time, since cases that already entered are no longer available for further entry. The results are simple and striking. The rate of entry was substantial, but roughly constant at around 10–15 percent per decade, until the post–World War II period. It then leapt to a high value (72 percent)—so high that the available cases were ex-

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*a* Countries that reported an initial enrollment ratio below 10 percent.
hausted quickly, and no further information can be obtained.

There are two obvious explanations for the dramatic post–World War II rise in the rate. First, the world society changed at about that time, with mass education becoming a more pressing obligation for any nation-state and with a dramatic increase in the likelihood that any given country would be seen, internally and externally, as an actual or prospective nation-state (Strang 1990). Both forces probably operated, with the triumph of both liberal and socialist forms of nation-states that were deeply rooted in mass education over more traditional empires and with the rise of the modern international organizational system (such as the United Nations and UNESCO) emphasizing both the nation-state and mass education.

Second, the founding of UNESCO, with its more efficient data-gathering system, helps produce our result as an artifact, because all sorts of countries, including those with little mass education, were then more likely to report data. This effect is undoubtedly operating, but the result is so extreme that it seems obvious that a real increase in the formation of world mass education occurred. In all probability, the rise of agencies like UNESCO indicated a real change, rather than simply an improvement in data collection. In any event, given the initial results, subsequent analyses include a dummy variable for the period 1950-80. Entry into the mass education world increased so much at this point that a control for time period is obviously needed for further analysis.

Country characteristics. Table 1 shows that for the 1880–1940 period, the rate at which countries entered the mass education arena varied within a surprisingly narrow range. We now examine characteristics of countries that affected how rapidly the countries went through this transition. We pursue the analysis of rates of entry with simple event-history models, analyzing the instantaneous rate of entry as it was affected by a variety of independent variables.5

Table 2 reports the results of a set of these analyses.

First, we include our typology of polity structural links to world models as a set of independent variables. This analysis is reported in the first column of Table 2. We omit the dummy variable for the category peripheral independent Western countries—the countries that, overall, enter the system most quickly, so the coefficients for the other categories are negative in comparison. (Note again that no core-country cases enter the analysis, since these countries already had enrollment rates above 10 percent and were thus dropped from the analysis.)

The results show that the type of polity linkage greatly affects rates of entry into mass education. The core colonies and dependencies, long-term non-Western independents, and core British Sub-Saharan colonies enter at rates below—but not far below—those of the peripheral independent Western countries. The peripheral colonies, French Sub-Saharan colonies, and especially countries in the far periphery, enter at significantly lower rates. The dummy variable for the post–World War II period shows significant positive effects. Overall, in our typology, nearness to the nation-state system turns out to be a powerful predictor of this indicator of the origins of mass education.

A further question arises: Beyond structural location, do characteristics of societies themselves add much to our ability to predict entry into mass education? To investigate this question, we added to the initial analysis available indicators of characteristics of national societies that might be suggested by Tuma and Hannan (1984) is used to analyze the conditions affecting the probability that "entry" will occur. The dependent variable is the instantaneous rate at which "entry" occurs,

\[ r(t) = \lim (dt \to 0) \frac{Pr(t, t + dt)}{dt} \]

where \(Pr(t, t + dt)\) is the probability that "entry" occurs between time \(t\) and \(t + dt\). The effects of explanatory variables are modeled in a log-linear framework to ensure nonnegative rates:

\[ r(t) = \exp(B^* \text{ independent variables}). \]

5 The event-history method described by
Table 2. Maximum Likelihood Estimates of the Rate of "Entry"a (Standard Errors in Parentheses)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter</th>
<th>Parameter</th>
<th>Parameter</th>
<th>Parameter</th>
<th>Parameter</th>
<th>Parameter</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral independent</td>
<td>Parameter</td>
<td>Parameter</td>
<td>Parameter</td>
<td>Parameter</td>
<td>Parameter</td>
<td>Parameter</td>
<td>Parameter</td>
</tr>
<tr>
<td>Western countries</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Core colonies</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>and dependencies</td>
<td>.517 (.52)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Non-Western independents</td>
<td>-.714 (.56)</td>
<td>-1.06 (.87)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>British Sub-Saharan colonies</td>
<td>-.937 (.52)</td>
<td>-.83 (.65)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Peripheral colonies</td>
<td>-1.25* (.59)</td>
<td>-1.09 (.84)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>French Sub-Saharan colonies</td>
<td>-1.58* (.49)</td>
<td>-1.28* (5.9)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Far peripheries</td>
<td>-2.01* (.56)</td>
<td>-2.02* (.84)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1950</td>
<td>2.22* (.59)</td>
<td>2.57* (.95)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Urbanization</td>
<td>.163 (.19)b</td>
<td>.0 (.0)b</td>
<td>.141 (.48)b</td>
<td>.187 (.39)b</td>
<td>.057 (.5)b</td>
<td>-.11 (.51)</td>
<td>.53 (.44)</td>
</tr>
<tr>
<td>Race (percentage white)</td>
<td>.268 (.15)</td>
<td>.002 (.004)</td>
<td>.61 (.59)</td>
<td>.53 (.44)</td>
<td>.5 (.51)</td>
<td>.11 (.51)</td>
<td>.53 (.44)</td>
</tr>
<tr>
<td>Christian</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Compulsory</td>
<td>—.3 (.3)</td>
<td>—.3 (.3)</td>
<td>—.3 (.3)</td>
<td>—.3 (.3)</td>
<td>—.3 (.3)</td>
<td>—.3 (.3)</td>
<td>—.3 (.3)</td>
</tr>
<tr>
<td>Independence</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.84 (.38)</td>
<td>-3.08 (.47)</td>
<td>-3.05 (.5)</td>
<td>-2.98 (.61)</td>
<td>-2.92 (.42)</td>
<td>-2.87 (.48)</td>
<td>-4.39 (.27)</td>
</tr>
<tr>
<td>Number of cases</td>
<td>274</td>
<td>158</td>
<td>274</td>
<td>274</td>
<td>274</td>
<td>274</td>
<td>274</td>
</tr>
<tr>
<td>Chi-square, d.f.</td>
<td>234, 7</td>
<td>14.6, 7</td>
<td>239, 8</td>
<td>235, 8</td>
<td>236, 8</td>
<td>234, 8</td>
<td>7.79, 5</td>
</tr>
<tr>
<td>p value</td>
<td>.001</td>
<td>.04</td>
<td>.002</td>
<td>.003</td>
<td>.003</td>
<td>.003</td>
<td>.03</td>
</tr>
</tbody>
</table>

a Appearing in the data set with an initial enrollment ratio below 10 percent.

b Variables added to the initial analysis one at a time.

* p < .05.
various functional (and competition) theories emphasizing the causal role of properties of societies themselves (see column 2 of Table 2): urbanization, racial composition, religious composition, independence, ethnolinguistic fractionalization, and the existence of a national rule of compulsory education (see definitions and sources presented earlier). These variables are added to the initial analysis one at a time, given the small size of the case base. The coefficients of the typology categories vary little, no matter which variable is added. The analyses cannot be directly compared with the initial one, since the addition of societal properties results in the loss of some cases because of missing data.

Such characteristics of the societies involved, over and above our basic typology, add little to the explanation of entry into mass education. The origins of mass education, these speculative analyses suggest, lie more in the organization of the elements of the nation-state model in a given territory than in any direct effects of the characteristics of the local society itself. As a final step, in the last column of Table 2, we show the effects of the societal characteristics that we considered, independent of our polity typology. Case bases are reduced by the lack of available data for each period, but the results are roughly similar to those in the initial analyses. The results show that these country characteristics, by themselves, produce a less satisfactory prediction of rates of entry than does the polity typology standing alone. Again, the results suggest that the important factor in the origins of mass education is the organization of the polity around the nation-state principle. This principle increasingly triumphs in an increasingly integrated and competitive Western nation-state system.

The Expansion of Mass Education

The overall data on mean enrollment rates for countries in each category suggest that rates generally rose through the century of the study. These data are of little use, and greatly understate the changes, because they are computed on various numbers of cases. Case numbers expand over time with the entry of new countries, many with low enrollment rates, into the data set. Better estimates of inclinations toward growth are made by looking at the growth in enrollments for constant sets of countries. We examined the mean growth in enrollment ratios for all cases for which we have data, for each decade through the period. We also examined the percentage of countries, during each decade, that experienced a growth in the enrollment ratio. The data show that the expansion of enrollments in mass education is the general rule. Overall, more than two-thirds of the countries show growth in a typical decade, with the average growth being about 5 percent of the available age group.

The exceptions to the pattern of general growth turn out to be of little substantive interest. Most of them arise in cases that reached the effective ceiling of mass enrollment, about 70 percent of the population aged 5–14. We then looked at the growth in enrollments for those countries with ratios below 50 percent at the beginning of each decade, along with the proportions of these countries that showed positive growth during the decade.

The results turned out to be clear. More than 85 percent of the countries with room for increased enrollments in each decade did, in fact, grow—a result that appears consistently throughout the whole period. Furthermore, mean growth was substantial. Finally, there seems to have been a good deal of homogeneity over time in the overall average rate of growth (at around 5 percent per decade), with the striking exception that growth rates increased, starting around World War II. The growth in enrollments was around 5 percent per decade before 1940 and then more than doubled after World War II to around 12 percent per decade.

The implication of these data is that once mass education began in a country, growth was a worldwide process throughout the period, increasing in intensity with World War II. We know from the analysis that many countries began the process late—and thus experienced no growth in the early decades of the
period. The point here is that once the process began in a country, growth was likely to be considerable. It may be noted that the expansion in reported enrollments was even more impressive than it may first appear. It occurred against a background in which, in most countries, there was rapid growth in the 5–14 age group that is the main target for mass education. Thus, despite great expansions in the underlying population, rates of enrollment consistently increased throughout the period.

**Modeling growth.** Growth in the enrollment rate is obviously likely to be related to a country’s starting point in a given decade. Certainly, there are ceiling effects—countries that were already at near-full enrollment were unlikely to expand primary education further. There are almost certainly some floor effects—countries with little mass education were likely to expand enrollments less than those with the institutional infrastructure in place. In short, it is necessary to see how growth, in a given country over a decade, is related to the starting point. The issue is of substantive interest, since different growth trajectories imply different causal processes. But the issue is also a crucial methodological precursor to any subsequent analysis of the expansion of enrollments. In models of the effects of other independent variables on later enrollments, earlier enrollments, with a specification of their effects, are the most crucial control variables.

With educational enrollment ratios, as with a good many other phenomena, two broad sets of growth models may be distinguished (see Meyer et al. 1977). Corresponding to the causal image of education spreading like a disease from those who have it to the untouched population are the familiar S-shaped curves of diffusion. Growth is low at low levels—there are plenty of people to be educated, but few to spread education. Growth is low near the ceiling—the impulse is spread from the many educated, but there are few left for growth. Growth is maximal at ratios in the middle of the distribution. Alternatively, one may imagine education as spreading from a common institutional force—for instance, world models, with their principles of state sovereignty and nation building—rather than from the already educated. In such cases, growth is more likely to be simply proportional to the population remaining for penetration and thus is only a declining function of the starting ratio. Growth is highest if there is little or no education at the starting point, declining to zero among the cases starting at the ceiling.

Table 3 shows, for each decade in our data, the relation of the growth in enrollments to a country’s enrollment ratio at the start of the decade. Countries are classified by their initial enrollment ratio, and for each group of countries so distinguished, mean growth levels are reported. Clear-cut patterns result. First, for the decades from the 1870s through the 1930s, growth tended to conform to the S-curve model, suggesting local dif-

<table>
<thead>
<tr>
<th>Period</th>
<th>Enrollment Ratio at Start of Decade*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0–20)</td>
</tr>
<tr>
<td>1870–80</td>
<td>4 (13)</td>
</tr>
<tr>
<td>1880–90</td>
<td>3 (19)</td>
</tr>
<tr>
<td>1890–1900</td>
<td>4 (28)</td>
</tr>
<tr>
<td>1900–10</td>
<td>3 (32)</td>
</tr>
<tr>
<td>1910–20</td>
<td>3 (32)</td>
</tr>
<tr>
<td>1920–30</td>
<td>4 (33)</td>
</tr>
<tr>
<td>1930–40</td>
<td>3 (14)</td>
</tr>
<tr>
<td>1940–50</td>
<td>8 (12)</td>
</tr>
<tr>
<td>1950–60</td>
<td>11 (37)</td>
</tr>
<tr>
<td>1960–70</td>
<td>11 (29)</td>
</tr>
<tr>
<td>1970–80</td>
<td>13 (12)</td>
</tr>
</tbody>
</table>

*Cell entries are mean growth. Cases are in parentheses.
fusion. That is, growth was highest halfway from the floor of zero to the effective ceiling of around 70 percent. It was lower for those starting below and for those starting above this middle range.

Second, after 1940 or 1950, the pattern changed. To the earlier S-curve pattern was added a tendency for growth to decline with higher starting points, suggesting the impact of a strong central force for educational expansion. Those countries with low starting points grew much more rapidly in the later period than in the earlier ones. But third, for all countries that were some distance from the effective ceiling, growth tended to be higher during the later period. There seems to have been much less resistance to, or fewer alternatives to, mass educational expansion.

Finally, the data show that growth indeed diminished above an effective ceiling of about 70 percent of the population aged 5–14. This has clearly been the case throughout the twentieth century. In the late 19th century, the effect was less strong. Before the rise of the institutions of differentiated mass secondary schooling, primary education in some countries had a longer cycle, of up to nine years instead of the more typical, and the more recent, standard of only six. As a result, the effective ceiling that was reached in a few more developed countries during the past century was probably nearer 90 percent than 70 percent. But with the rise of mass secondary arrangements (such as the middle, or junior high, school), the primary schooling cycle tended to standardize around a shorter period, as with the American drift from an eight-year to a six-year primary cycle.

The important finding that the mass educational expansion process changed around World War II can be investigated in a further step. Table 4 reports results from a series of multiple regression analyses of all countries in all the decades pooled together. We exclude instances of countries at or above an enrollment ratio of 70 percent at the beginning of a decade (which we take to be the ceiling), but otherwise include all available cases. Thus, a given country is likely to enter the data set several times. In fact, the pooling gives a data set of 927 cases. Growth in the enrollment ratio in percentages of the population aged 5–14 is taken as the dependent variable. As independent variables, we consider the two formulations of the enrollment starting point for the decades that were discussed earlier. Leading to the S-curve, we include as an independent factor the initial enrollment rate \( p1 \) multiplied by the effective ceiling minus this rate \( (70 - p1) \). This factor captures

### Table 4. Multiple Regression Estimates of Growth of Primary Enrollment Ratios, Pooled Panel Model With 10-Year Lags: Models of Effects of Starting Point

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>S.E.</th>
<th>Coefficient</th>
<th>S.E.</th>
<th>Coefficient</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>( b^* )</td>
<td>0.007**</td>
<td>0.00</td>
<td>0.006**</td>
<td>0.00</td>
<td>0.007**</td>
</tr>
<tr>
<td></td>
<td>(0.26)</td>
<td></td>
<td>(0.24)</td>
<td></td>
<td>(0.25)</td>
</tr>
<tr>
<td>( c^* )</td>
<td>0.067**</td>
<td>0.01</td>
<td>0.05*</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
<td></td>
<td>(0.10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( b ) (1940–80 only)</td>
<td></td>
<td></td>
<td>0.002</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.09)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( c ) (1940–80 only)</td>
<td></td>
<td></td>
<td>0.07*</td>
<td>0.02</td>
<td>0.115**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.16)</td>
<td></td>
<td>(0.25)</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.55</td>
<td>0.92</td>
<td>-1.71</td>
<td>0.65</td>
<td>-0.35</td>
</tr>
<tr>
<td></td>
<td>(0.08)</td>
<td></td>
<td>(0.13)</td>
<td></td>
<td>(0.12)</td>
</tr>
<tr>
<td>Number of cases (countries x time points)</td>
<td>927</td>
<td>927</td>
<td>927</td>
<td>927</td>
<td>927</td>
</tr>
</tbody>
</table>

* Standardized coefficients in parentheses.

\[ b = p1 \times (70 - p1) \]
\[ c = (70 - p1) \]

where \( p1 \) is the primary enrollment ratio at the beginning of a decade and \( p2 \) is the primary enrollment ratio at the end of a decade

* \( p < .05 \).

** \( p < .001 \).
the idea that education expands into the available population at a rate determined by its local presence. Leading to the simple model of growth as occurring from a constant source into the available population, our second independent factor is simply the effective ceiling minus the initial rate \((70-p_1)\). Thus, the basic model is

\[
p_2 - p_1 = a + b(p_1)(70-p_1) + c(70-p_1) + \text{error},
\]

where \(p_2\) is the enrollment ratio at the end of a decade and \(p_1\) is the ratio at the beginning of the decade. In Table 4, we estimate this model for the entire data set across the whole 1870–1980 period. But we also, given the earlier empirical observation that the educational expansion process changed as of the World War II period, estimate models permitting effects to differ for the early and later periods:

\[
p_2 - p_1 = a + b(p_1)(70-p_1) + c(70-p_1) + d(1940–80\text{ only}) + e(1940–80\text{ only})(70-p_1) + \text{error}.
\]

The results in Table 4 show that in the overall analysis, both the coefficient reflecting the S-curve diffusion process and the coefficient reflecting a world process operating with a simple ceiling effect substantially affect growth. In the more refined analysis that allows for different effects over time, the S-curve process of diffusion clearly operates throughout the whole period. But the added process reflecting an increased worldwide direct impetus to educational expansion, limited only by a ceiling effect, becomes significant mainly after World War II. In fact, simply eliminating this factor before World War II, as in the final equation in Table 4, lowers the overall variance accounted for only a little.

Further experiments with the data, permitting effects to differ across more refined periods than our simple 1940 break point, suggested little overall improvement in the fit of the regression models. Thus, we conclude that educational expansion throughout the period reflected a local diffusion process operating with greater force as enrollments expanded. Added to this process around World War II was a worldwide drive for the expansion of educational enrollments into the available population, regardless of previous enrollment levels.

The events around World War II clearly made mass education a more urgent business. Two slightly distinct causal factors may have been involved: (1) an intensified pressure to enact the nation-state model everywhere and (2) a tightened relationship between the nation-state model and mass education as a legitimated means, bolstered by both human capital and political modernization theories. Both these factors, contemporary thinking in political sociology suggests, were enhanced by such variables as the breakdown of the older empires in the war and the hegemony of the liberal and education-focused nation-state model. The simple analyses of Table 4 account for notable but still relatively modest proportions of the variance in growth in enrollments across countries and decades of the period. The question, now, is how additional independent factors may account for more of this variation.

**Independent effects of national characteristics.** The main arguments in the field took it for granted that mass educational expansion is a product of the requirements of society and internal social relations. For all sorts of reasons, complex modern societies demand better trained and socialized participant members. Whether the requirements are mainly economic, political, social, or cultural is not clearly defined, but the assumption tends to be that various dimensions of modernization require and produce expanded mass education. It is hard to find indicators of various sorts of modernization and development for many countries over a century-long period, but we have measures in a number of substantive areas. If general social or cultural modernization is a main factor in expansion, the indicators we have ought to be adequate enough to reflect it.

In Table 5, we examine the effects of
Table 5. Multiple Regression Estimates of Growth of Primary Enrollment Ratios (1870–1940), Pooled Panel Model With 10-Year Lags: All Substantive Independent Variables Interacted with $b^a$

<table>
<thead>
<tr>
<th>Basic Model</th>
<th>Coefficient</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$b$ (1870–1940)</td>
<td>.004**</td>
<td>.001</td>
</tr>
<tr>
<td>Constant</td>
<td>.271</td>
<td>.923</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>Number of cases</td>
<td>279</td>
<td></td>
</tr>
<tr>
<td>Elaborated Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$b$ (1870–1940)</td>
<td>.007**</td>
<td>.002</td>
</tr>
<tr>
<td>Urbanization</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Race (percentage White)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Christian</td>
<td>-.000</td>
<td>.001</td>
</tr>
<tr>
<td>Compulsory</td>
<td>-.000</td>
<td>.001</td>
</tr>
<tr>
<td>Independence</td>
<td>-.003*</td>
<td>.001</td>
</tr>
<tr>
<td>Constant</td>
<td>.169</td>
<td>.925</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td>Number of cases</td>
<td>279</td>
<td></td>
</tr>
</tbody>
</table>

$^a$ Standardized coefficients in parentheses.

$^b$ All independent variables are interacted with the term $b$.

$^* p < .05$.

$^{**} p < .001$.

several independent variables for the 1870–1940 period (the baseline model for the later period differs, as shown in Table 4, requiring a separate analysis). We consider the variables defined earlier: urbanization, religious composition, independence status, racial composition, ethnolinguistic fractionalization, and the presence of a national rule of compulsory education. Each variable is entered into our models of educational growth in Table 5. The analysis takes the form of the following model, which is a simple elaboration of our basic model for the 1870–1940 period:

$$p_2 - p_1 = a + b(p_1)(70 - p_1) + c(\text{Ind. Var.}) + (p_1)(70 - p_1) + \text{err.}$$

The independent variables are added as interaction terms, with the expectation that they would accelerate the main diffusion process. An additive specification, in this context, makes less sense. No independent variable may be expected to produce an effect at the ceiling, nor should its effect at the floor be large. For the 1870–1940 period, the interaction is simply by the single S-shaped basic term.

The results of Table 5, a series of obvious tests of standard lines of thought, are strikingly negative. The effects of the independent variables are generally insignificant, and adding them to the basic equation increases the variance accounted for only modestly. Only the effect of national independence reaches statistical significance, and that effect lies in the wrong direction from the predictions of received theory. This surprising finding reflects the early rise of mass education in such cases as the British Caribbean colonies and the Philippines. The effect of urbanization—a great mainstay of all versions of functionalist theory—is essentially zero. The effect of ethnolinguistic fractionalization—a direct indicator of the potential forces of status competition toward educational expansion—is also very small. Parallel striking results appeared in earlier work on the expansion of enrollments after World War II (see Meyer et al. 1977). But it was assumed that they simply reflected a world in which mass education was so completely taken for granted as a national desideratum that local variation in independent factors retained little effect. It was reasonable to expect that local societal variation would show stronger effects earlier. It is surprising, but local variation does not.

To replicate the earlier research, we repeated the analysis in Table 5 for the 1940–80 period. In this case, since the baseline model includes two distinct diffusion terms, the analysis was carried out twice: first, with the independent variables interacted with the S-curve diffusion term and then, with them interacted with the simple ceiling-effect term. The results are not presented here, since again the independent variables show few effects. In one analysis, urban-
ization shows a slight positive effect, and the existence of a compulsory education rule shows a slight effect (but in the "wrong" direction) in one other. But overall, the five independent variables show almost no effects, and only trivially increase the variance accounted for.

A decade-by-decade examination of the data to find cases of the exceptional expansion of enrollments produces clear illustrations of why the independent variables do not operate. We found early expansion of enrollments in such functionally surprising places as Puerto Rico, the Philippines, and Barbados—entities outside the orbit of urban or independent or bureaucratized or White society. These cases suggested that our structural typology of polity linkages to world models might show effects.

To explore this possibility, we repeated the analysis in Table 5 with a parallel analysis in Table 6, this time using the polity-linkages typology as a set of independent variables (core is the omitted category). Again, each dummy variable in the typology is interacted by our main diffusion effect for the 1870–1940 period. The results of Table 6 are again surprisingly negative. The variance explained in the analysis is not much greater than with the baseline model. And the specific coefficients suggest relatively little variation across the categories of the typology. Only the non-Western independents and the core countries behave as expected, with positive effects on expansion. The same analysis repeated for the 1940–80 period (again, with two forms of interaction terms considered) also shows almost no enhanced effects over the baseline model in predicting the expansion of enrollments. Little of interest appears, and the results are not shown in the tables.

Thus, overall, the analyses permit a simple conclusion: Once countries enter the world of mass education, reporting some level of enrollment, growth is general—modified by floor and ceiling effects. Neither the properties suggested by traditional functional analyses nor the categories developed in a typology of polity linkage to world models make much difference. Countries move toward universal mass education at rates that vary, but do not vary much with the general predictive factors we have considered.

<table>
<thead>
<tr>
<th>Basic Model</th>
<th>Coefficient</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>b(1870–1940)*</td>
<td>.005**</td>
<td>.000</td>
</tr>
<tr>
<td>Constant</td>
<td>.697</td>
<td>.78</td>
</tr>
<tr>
<td>R²</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>Number of cases</td>
<td>487</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elaborated Model</th>
<th>Coefficient</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>b(1870–1940)*</td>
<td>.007**</td>
<td>.001</td>
</tr>
<tr>
<td>Peripheral independent Western countries b</td>
<td>-.004*</td>
<td>.001</td>
</tr>
<tr>
<td>Core colonies and dependencies b</td>
<td>-.002</td>
<td>.001</td>
</tr>
<tr>
<td>French Sub-Saharan colonies b</td>
<td>-.005</td>
<td>.003</td>
</tr>
<tr>
<td>British Sub-Saharan colonies b</td>
<td>-.002</td>
<td>.002</td>
</tr>
<tr>
<td>Peripheral colonies b</td>
<td>-.002</td>
<td>.014</td>
</tr>
<tr>
<td>Non-Western independents b</td>
<td>.004</td>
<td>.002</td>
</tr>
<tr>
<td>Core countries b</td>
<td>.09</td>
<td></td>
</tr>
<tr>
<td>Number of cases</td>
<td>487</td>
<td></td>
</tr>
</tbody>
</table>

* Standard errors in parentheses.

b All independent variables are interacted with the term b.

* b = p1 * (70-p1),

where p1 is the primary enrollment ratio at the beginning of a decade.

* p < .05.

** p < .001.

Conclusions

Overall, we find that countries in the old core were already approaching universal mass education by 1870. Thereafter, mass educational systems appeared at a rather steady rate around the world.

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6 Studies of educational expansion in the United States also fail to show the effects of the passage of compulsory education laws (Soltow and Stevens 1981). Such laws often follow, rather than precede, educational expansion.
until World War II, with a sharp increase in the rate at that point. The rate of entry into the world of mass education is affected little by such properties of a national society as urbanization, racial or religious composition, independence, or even the existence of a compulsory education rule. The rate of entry is strongly affected by structural location in the world society. Countries that were linked to both elements of the nation-state system, with central authority validated by membership in or dependence on the world society and with some sort of principle of national formation present, were much more likely to create mass education systems. What is important and contrary to some explanatory images, they included many of the central colonies of the core powers.

The expansion of mass education, once formed, was endemic throughout the period, but rates of expansion increased after World War II. In the 1870–1940 period, expansion followed an S-shaped diffusion pattern, limited by floor and ceiling effects, as if educational systems were growing on a societally engendered process within a supportive world context. After World War II, the same process continued, but an added force that applied everywhere (limited only by ceiling effects) gained strength—as if the world society itself was playing an immediately directive role. While expansion was endemic in the system, leading to a modern world in which almost universal mass education appeared, the effects of particular properties of national modernization or of structural location in the world society were modest. There was national variation in expansion, but it was affected little by the properties suggested by traditional functional theory or by a typology of locations in the world system.

Mass education spread around the world with the spread of the Western system, with its joined principles of national citizenship and state authority. As these principles appeared in a territory, sometimes through independence but more often through colonialization by core powers, mass education appeared. Once mass education appeared, it was likely to expand toward universality. Both the rates of appearance of mass education and the rates of expansion accelerated sharply around World War II, probably affected by both the intensification of the nation-state principle and the increased centrality of mass education within the model of the national state.

The logic of universal modern schooling is one that links the individuals who are conceived as making up the modern nation with the unified collective that is represented by the modern state. Other historical models of polity and society do not carry this logic or the universal socialization system that the logic implies.

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World Expansion of Mass Education


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