



---

The Worldwide Expansion of Higher Education in the Twentieth Century

Author(s): Evan Schofer and John W. Meyer

Source: *American Sociological Review*, Vol. 70, No. 6 (Dec., 2005), pp. 898-920

Published by: American Sociological Association

Stable URL: <http://www.jstor.org/stable/4145399>

Accessed: 07/01/2010 20:39

---

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/action/showPublisher?publisherCode=asa>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).



American Sociological Association is collaborating with JSTOR to digitize, preserve and extend access to *American Sociological Review*.

<http://www.jstor.org>

# The Worldwide Expansion of Higher Education in the Twentieth Century

Evan Schofer  
University of Minnesota

John W. Meyer  
Stanford University

*The authors analyze the rapid worldwide expansion of higher educational enrollments over the twentieth century using pooled panel regressions. Expansion is higher in economically developed countries (in some but not all analyses) as classic theories would have it. Growth is greater where secondary enrollments are high and where state control over education is low, consistent with conflict and competition theories. Institutional theories get strong support: growth patterns are similar in all types of countries, are especially high in countries more linked to world society, and sharply accelerate in virtually all countries after 1960. The authors theorize and operationalize the institutional processes involved, which include scientization, democratization and the expansion of human rights, the rise of development planning, and the structuration of the world polity. With these changes, a new model of society became institutionalized globally—one in which schooled knowledge and personnel were seen as appropriate for a wide variety of social positions, and in which many more young people were seen as appropriate candidates for higher education. An older vision of education as contributing to a more closed society and occupational system—with associated fears of “over-education”—was replaced by an open-system picture of education as useful “human capital” for unlimited progress. The global trends are so strong that developing countries now have higher enrollment rates than European countries did only a few decades ago, and currently about one-fifth of the world cohort is now enrolled in higher education.*

The past century has seen tremendous expansion of higher education around the world.

---

Direct correspondence to Evan Schofer, Department of Sociology, University of Minnesota, 267 19th Avenue South, Minneapolis, MN 55455 (schofer@soc.umn.edu). Supported by a National Academy of Education/Spencer Foundation Postdoctoral Fellowship (to Evan Schofer) and by grants (to Francisco Ramirez and John Meyer) from the Spencer Foundation (20000085) and from the Bechtel Center of the Stanford Institute for International Studies. The authors thank David Frank, Gero Lenhardt, Marion Fourcade-Gourinchas, Francisco Ramirez, Gili Drori, and the members of Stanford's Comparative Workshop for valuable comments on earlier drafts. We also received helpful comments from participants in seminars at Stanford and the universities of Bielefeld, Halle-Wittenberg, and Minnesota.

In 1900, roughly 500,000 students were enrolled in higher education institutions worldwide, representing a tiny fraction of 1 percent of college-age people (Banks 2001). By 2000, the number of tertiary students had grown two-hundredfold to approximately 100 million people, which represents about 20 percent of the cohort worldwide. Enrollment ratios are rapidly climbing past 50 and even 80 percent in some industrialized countries, foreshadowing the possibility of universal higher education (UNESCO 2004).

Explanatory research on the rapid expansion of higher education is less extensive than might be expected. With institutionalization, the virtues of higher education have become taken for granted. So, it is more common for scholars to decry limited expansion (especially for minorities, women, or lower-status groups) than to analyze why expansion occurs.

Prior studies have noted growing tertiary enrollments in particular societies, and have typically invoked explanatory frameworks that emphasized the local context. In the United States, it is conventional to call attention to the “GI Bill.” In fact, the GI Bill produces only a minor “blip” that is dwarfed by subsequent expansion (see section A of the *ASR* Online Supplement: <http://www2.asanet.org/journals/asr/2005/toc048.html>). In Third World countries, scholars commonly point to decolonization as generating expansion. In Europe, case researchers refer to American influences, the weakening of standards associated with democratization, or the local political context (Wittrock 1993). These idiosyncratic explanations may help make sense of some national or period-specific variation, but they have difficulty accounting for what turns out to be a rather universal global trend.

Comparative researchers have made the critical observation that the twentieth-century expansion of higher education is a *worldwide* phenomenon. Riddle’s (1990, 1993) study of the historical formation of universities found that expansion is very general in the modern period, and was unable to isolate factors that strong-

ly affected it. Meyer et al. (1977), in their cross-national study of tertiary enrollment ratios from 1950 to 1970, found very rapid increases in enrollments in all types of countries. Tertiary expansion, in fact, considerably outpaced the rapid expansion of mass education during the period. Similarly, Windolf’s (1997) longitudinal study of enrollments in several industrialized countries from 1850 to 1990 finds rapid growth, especially after World War II. Yet these studies, too, were unable to find country characteristics that strongly affect the rate of expansion—not even standard variables such as economic development.<sup>1</sup>

The character and extent of the overall explanatory problem is indicated in Figure 1, which presents global higher educational enrollments per 10,000 capita over the twentieth century. The figure shows the extreme growth that is concentrated in the latter part of the century.

<sup>1</sup> Windolf does find some modest effects, such as a positive effect of unemployment, which generates a short-term increase in enrollments. Nevertheless, the fundamental causes of expansion remain unclear.

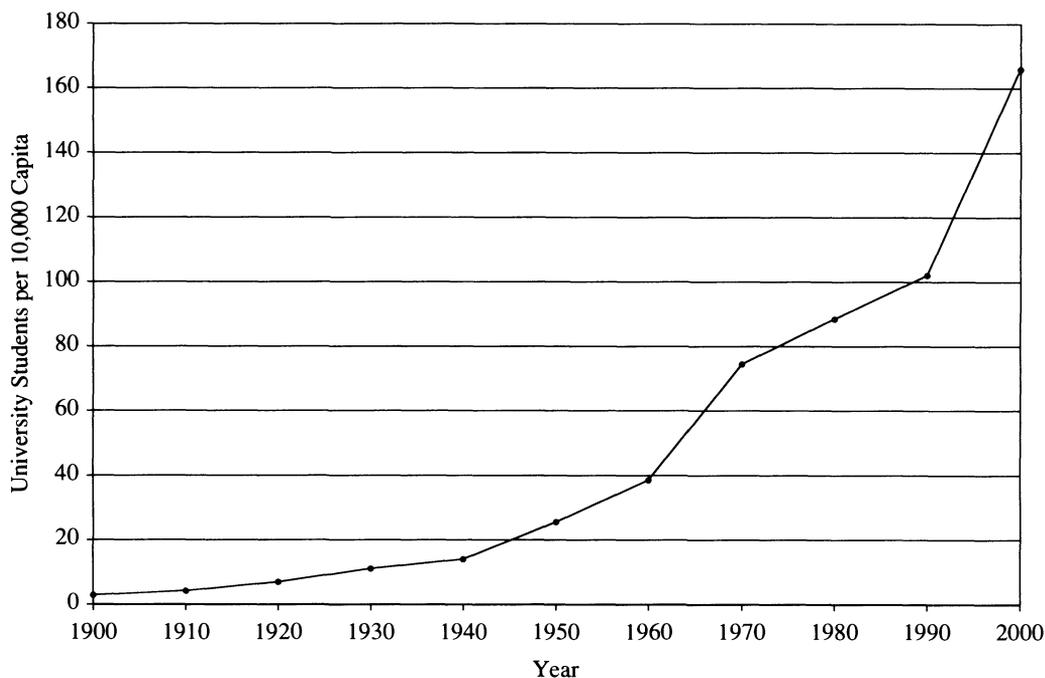


Figure 1. World Higher-Education Students per 10,000 Capita, 1900–2000.

We bring to this problem new data and arguments. Our data spans a longer period of time and more countries than do prior studies. We conduct a more sophisticated set of analyses of enrollment expansion, and we provide a more systematic and comprehensive examination of competing arguments. Moreover, we develop a new global explanation to account for the broad-based postwar expansion of higher education. We argue that a new model of society became institutionalized in that period, reflected in trends toward increasing democratization, human rights, scientization, and development planning. This global institutional and cultural change paved the way for hyper-expansion of higher education. We also contribute to the neo-institutional literature, in which our argument is rooted, by providing greater precision—in argument and operationalization—regarding the historical drivers of institutional change.

We begin with a discussion of national variation in higher education. Later, we develop our global institutional argument and turn to a statistical analysis of higher-education enrollments from 1900 to 2000.

## EXPLANATIONS OF NATIONAL VARIATION

### FUNCTIONALISM

*Traditional socioeconomic functionalism*, often employed as a baseline or straw man in the field (Collins 1971), argues that national economic development, rationalization, and differentiation create collective and individual demands for both specialized training and loyalty to a common culture. On the supply side, development also creates the resources to meet the needs. Higher education can also be seen as a consumption good that might especially be desired by individuals in societies where basic needs have been met. The core proposition is that the expansion of higher education is strongly affected by national economic development.

Traditional functionalism also has variants that shift the main argument from the national to the global level. Here the expansion of higher education in core countries aids in coordinating or controlling relationships in the world (see Clark 1992; Dale and Robertson 2002). Again, the predictions change very little despite variations in political tone (e.g., Wallerstein 1974 and elsewhere). Thus, the lines of thought

previously reviewed all suggest the following hypothesis:

*Hypothesis 1:* Economic development produces the expansion of higher education.

In fact, however, empirical researchers do not find very strong effects of national industrialization or economic development on the expansion of education at any level (Meyer et al. 1977, 1992b; Windolf 1997). Moreover, the rapid expansion of higher education in the 1960s does not coincide with especially large historical changes in occupational structures, job skill requirements,<sup>2</sup> or labor market demands that would create a need for massive expansion of higher education (Wyatt 2005; see also Morris and Western 1999). In response to the theoretical and empirical problems of functionalist arguments, two broad lines of thought have evolved. Institutional theory treats functional ideas about socioeconomic development as cultural or ideological myths and models rather than as reflections of functional realities. Conflict and organizational theories treat socioeconomic development as providing resources and grounds for competition rather than for functional efficiency. We discuss these theories in turn.

### THEORIES OF CONFLICT, COMPETITION, AND ORGANIZATION

A very distinctive idea arises from strong conflict and competition theories: as education becomes important in the attainment of social status, groups and individuals compete more intensively for success in education, producing inflationary credential expansion far beyond any original functional requirements (Bourdieu and Passeron 1977; Collins 1971, 1979).

A principal theme in conflict theories is that elite groups use education to perpetuate the dominance of their status-group culture, not simply to ensure their children's success (Bourdieu and Passeron 1977; Collins 1971, 1979). This theme has implications for the con-

<sup>2</sup>As Morris and Western (1999:34) point out, "The evidence for a general increase in the demand for skills is weak. . . [and the] evidence for the more specific hypothesis of a technology-driven increase in demand for skills is equally weak."

tent of higher education, but not directly for its overall expansion. It is common, however, to argue that educational expansion is more rapid (and less functional) when status group competition is high (Rubinson and Fuller 1992). As a concrete illustration, American higher-educational expansion, with its attendant cultural embellishment, is thought to reflect reactions to immigration. A common cross-national measure used to assess such forms of competition is the degree to which a country has competing ethnic and linguistic groups.<sup>3</sup>

*Hypothesis 2:* Higher education expands more rapidly under conditions of high ethnic-group competition.

Some scholars, however, suggest the contrary: powerful groups may constrain the expansion of education to reduce the mobility opportunities of competing groups. For instance, Ralph and Rubinson (1980) find that the expansion of public schooling slowed during periods when incoming immigrant groups were perceived as threatening. Thus, we evaluate Hypothesis 2 with a two-tailed test.

What is clear in the literature is that organizational conditions affect the operation of competitive pressures for the expansion of higher education. That is, organizational decentralization permits such pressures to operate in very inflationary ways (Ben-David and Zloczower 1962). This is a conventional explanation of early rapid higher-educational expansion in America. The attempt of the East Coast universities to block expansion in western states failed early on (Hofstadter 1963). On the other hand, strong states in Britain and France, allied with elite educational programs, were able to delay higher-educational expansion to a great extent.

A striking case in the twentieth century occurred in communist countries. After a postwar period of educational expansion, communist countries confronted a crisis between continued Party control over society, repre-

senting privileged working-class power, and the rise of a new class of highly schooled people. Quite overt conflicts were involved. In essentially every case, after about 1970, the communist countries chose Party control and sharply restricted further higher-educational expansion (Lenhardt and Stock 2000; see also Baker, Köhler, and Stock 2004).

Despite the convincing character of some concrete cases, the overall idea about the constraining effects of centralization is rather fragile. Looking at the set of countries and time periods where higher education is a core institution, one can unambiguously predict rapid educational expansion in decentralized cases. One can less clearly predict, however, slow expansion in centralized countries, which might use education to control society. The communist case provides a good illustration. In the early parts of the postwar period, these countries in fact expanded higher education quite rapidly. The real issue then arose over which *model* of society the Party would employ—and, constrained by much pressure from workers and worker-centered Party ideology, they chose the older protective paternalist system rather than the expansive new human-capital one (Lenhardt and Stock 2000).

As a result, we put forth the case that centralized systems control expansion quite cautiously:

*Hypothesis 3:* Under global conditions of high institutionalization of higher education, expansion will be rapid in decentralized systems, but may be controlled in centralized ones.

#### **INSTITUTIONAL THEORY: GLOBAL FACTORS**

Institutionalist explanations make up another broad response to the empirical problems of functionalism. Three features of higher-education expansion in the twentieth century challenge functionalist views. First, the expansion depicted in Figure 1 vastly outruns changes in conventional independent variables. Second, the expansion occurs across radically varying national societies. Third, rapid expansion is dramatically concentrated in a particular time period. The expansion of higher education has the quality of a single global “event” or sea

<sup>3</sup> Of course, there are many other types of status group competition. Unfortunately, relevant cross-national measures are not available at the start of the century. We later explore some additional variables (e.g., economic inequality) in the contemporary period.

change occurring in the decades following World War II.

CHANGING INSTITUTIONALIZED MODELS OF SOCIETY AND THE RISE OF HIGHER EDUCATION: 1930–1960. Historical trends in higher-education expansion are consistent with the notion that properties of national education and society are strongly affected by prevailing world models (Meyer et al. 1992a). This idea is important in explaining isomorphic change in a period-specific worldwide movement. We need to further explain, however, why the prevailing models so dramatically emphasized higher-educational expansion.

On examination, the *nature* of the change is quite clear. Before World War II, higher education, especially in Europe, was generally seen as properly creating a limited set of national elites required by closed national societies and occupational systems.<sup>4</sup> Society needed some secondary school teachers, doctors, lawyers (especially civil servants), and priests (Paulsen [1893] 1906). A few scientists were also necessary (though science was by no means seen as the engine of national development as it is viewed now [Drori et al. 2003]). At best, a poorly controlled expansion amounted to social inefficiency: more individuals were being trained than there were positions to employ them. At worst, expansion could create an explosive mixture of anomic and unemployed elites. Given the older prevailing model of society, there was a real fear of “over-education” as enrollments grew. A New York Times article from the 1930s captures the sentiment:

The steadily rising tide of engineering students in German universities, with consequent overcrowding in the engineering profession, has moved [several German trade associations] and other organizations to *issue a public warning that a sterile, educated proletariat is being produced* without a chance of gainful occupation while millions are wasted on its training. (Jedell 1931:56; italics added)

<sup>4</sup> Here “closed” refers to the institutionalized constraints on class mobility historically typical of many nineteenth-century European societies, and to their tendency to link mobility opportunities closely to fixed conceptions of societal requirements.

The German trade and industry associations mentioned in this article go on to attack several “pernicious” views in society: “[the] exaggerated overvaluation of schooling,” the belief that higher education is needed to work in “all sorts of activities in industry, trade, and . . . government,” and the “erroneous belief [among students] that their diploma will help them more readily develop an income.” In short, higher education was not relevant for most people, and neither the individual nor society would benefit from an excess of graduates.

Yet in a few decades a more progressive vision became hegemonic worldwide, and the older viewpoints withered away. The older view seems quaint and outdated in the face of the contemporary orthodoxy: that education creates generalized human capital that benefits both individuals and society. The change reflects ideology as much as any experience or research. It has been surprisingly difficult to document empirically the “need” for college educational skills in many occupations that require such credentials (classically, Berg 1970; Windolf 1997).

After about 1960, the whole “over-education” theme weakened, aside from a few outposts (e.g., Freeman 1976). Fiala and Gordon Lanford (1987) show that precisely in this period, national doctrinal statements about the purposes of education shifted from a model of education as fitting people into a “static” society and labor market to a conception of education as producing human capital for national socioeconomic expansion. In the former model, rapid expansion creates inefficiency and anomie. In the latter, it is a source of progress.

This global cultural change has some obvious historical roots. Closed corporatist and statist models of society (Jepperson 2002) were deeply stigmatized as having created two disastrous world wars, a great depression, and the horrors of genocide. They were further decisively defeated in war, in large part by aggressively liberal, open, and individualist societies. An open international system was under construction, rife with Anglo-American influence, oriented precisely against a closed model of the nation-state and society (Boli and Thomas 1999; Djelic 1998). In this system, formerly suppressed colonies could make legitimate claims for high levels of socioeconomic progress—for which, in the ideologies maintained since the

period, human capital is the preferred instrument (e.g., Harbison and Myers 1964).

The new model of society was linked to the following institutional changes that legitimated an expansion of schooled elites:

1. Democratization, liberalization, and the expansion of human rights reinforced a picture of the rights and the capacities of individuals for unlimited amounts of schooling. An “education for all” movement has gone global (Chabbot 2002).
2. The worldwide expansion of science and increasing scientization of society turned schooling into a mainstay of growth and of the enhancement of human potentials (Drori et al. 2003).
3. The rise of national development logics, later developing into generalized notions of individual and organizational planning for indefinite growth, made progressive change a main focus of social policy (Hwang 2003).
4. The structuration of organizations and institutions in the world polity served to promulgate pro-educational cultural models and discourses.

These four dimensions of postwar postmodernist society provide indicators that we employ in our subsequent empirical analyses of global expansion. We turn next to a brief discussion of each indicator. Together, they address our core world-level hypothesis:

*Hypothesis 4:* The postwar global shift to a liberal, rationalist, and developmental model of society generated a worldwide pattern of increased higher educational expansion.

**DEMOCRATIZATION AND HUMAN RIGHTS.** The postwar era saw successive global attacks on exclusion, generating new social norms of individual equality and empowerment. From this vantage point, all individuals could be seen as suited for large amounts of schooling. The expansion of democracy and human rights was very much a *world* process (Ramirez, Soysal, and Shanahan 1998). Discourses of formal equality—such as the UN’s Universal Declaration of Human Rights—became conventional in the international system (Boli 1980; Tsutsui and Wotipka 2004). Under such an institutional order, the absence of particular groups from higher education could more easily be seen as a social problem. Social movements successfully pursued the expansion of higher education for minority groups, rural, and lower-status people, and to a great extent, women

(Bradley and Ramirez 1996; Ramirez and Wotipka 2001).

**SCIENTIZATION.** Western-style science has expanded greatly in its scope and centrality over the past two centuries, with rapid globalization occurring in the post–World War II era (Drori et al. 2003; Schofer 2003). Domains of the social world are increasingly brought under the authority of science (Schofer 1999); individuals increasingly draw upon medical and psychological understandings (Frank, Meyer, and Miyahara 1995); and the activities of firms and states are increasingly informed by economic theories and scientific management principles (e.g., Gourinchas and Babb 2002; Drori, Meyer, and Hwang 2006). By linking university knowledge to the mundane workings of individual and organizational life, scientization increases the apparent utility of higher education for a wide range of social roles. This represents a sharp departure from an earlier era where words such as “academic” and “scholastic” connoted a *lack* of relevance to practical matters.

**NATIONAL DEVELOPMENT AND PLANNING FOR PROGRESS.** The post–World War II period saw the global institutionalization of doctrines of national development (Hwang 2003). Images of a static society requiring a fixed number of elites gave way to open-ended conceptions of the possibilities for growth (Chabbot 1999). Human capital and manpower planning theories suggested that everyone might become more productive through increased education, and traditional standards were cast as undemocratic and unprogressive (Dent 1961). Cold War competition and European postwar reconstruction efforts gave rise to an *international development regime* that institutionalized efforts to aid developing nations (Chabbot 1999; Djelic 1998). Toward the end of the twentieth century, *centralized* national planning itself had receded in importance. It was replaced by a decentralization of planning to individual and organizational levels: everyone could be an educated strategist for an expansive future (Hwang 2003).

**GLOBAL STRUCTURATION.** The three trends just discussed are creatures of a world polity.

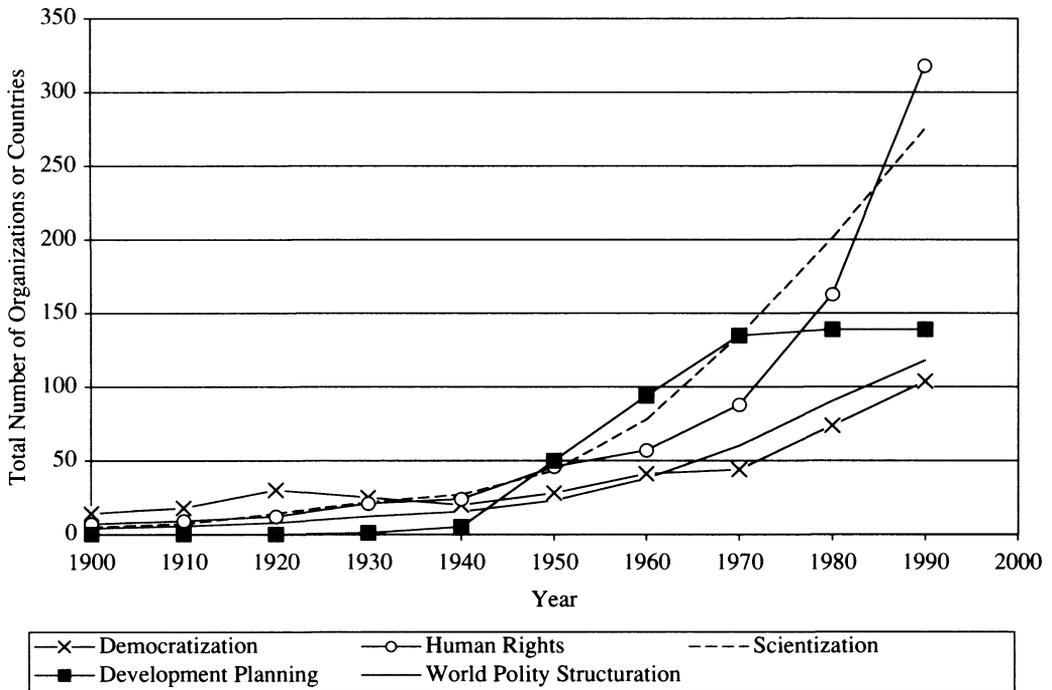
Discourses of development planning and education became prominent in the international sphere. United Nations Educational, Scientific and Cultural Organization (UNESCO) is an obvious example, embodying many of the themes that we have explored: science, equality/democratic participation, and the importance of education for national development. Similar themes can now be found across the UN system and in thousands of international nongovernmental organizations. The expanding organizational and institutional structure of the world polity intensifies the influence of global discourses on nations (Schofer and Hironaka 2005; Schofer and McEneaney 2003).

Figure 2 shows historical trends of five key world-level dynamics: democratization, national development planning, human rights, scientization, and structuration of the world polity. Measures are variants of those discussed shortly, with simpler scales to ease interpretation (see Data and Methods section): 1) the total number of democracies in the world; 2) the total number of international human rights

organizations in the world (Tsutsui and Wotipka 2004); 3) the total number of international scientific associations in the world; 4) the total number of countries that have created a national development plan; and 5) the total number of international nongovernmental organizations (INGOs) in the world (divided by 100 to fit the scale), which reflects the overall structuration of the world polity. All these indicators accelerated shortly after World War II, reflecting the institutionalization of a new worldview that encouraged expansion of higher education.

**INSTITUTIONAL THEORY: NATIONAL FACTORS**

With the installation of modernization and development theories as global ideologies and models, policies linked to these theories spread rapidly. Institutional theories (see Meyer et al. 1977, 1992a, and 1992b) emphasize the modern diffusion of highly rationalized models of education and society. This line of argument supports hypotheses about global effects, as well as some national effects deriving from the



**Figure 2.** World Polity Trends Supporting the Expansion of Higher Education.

Note: World polity structuration measure divided by 100 to fit scale.

global ones. Most important, nations are not equally likely to conform to models that are taken for granted in the world polity. World influences may strongly affect European societies, which are enmeshed in the European Union and countless international organizations, and less strongly affect peripheral societies such as North Korea or Bhutan. Nations more densely linked to the world polity should conform the most (see Schofer and Hironaka 2005).

*Hypothesis 5:* Higher education expands most rapidly in countries linked in organization and identity to world models.

An implication of strong versions of institutional theories is that countries respond to the pressures of world models more than to their own histories. Indeed, if their own histories produce globally unacceptable effects, they are likely to correct themselves. This produces a prediction dramatically opposed to the ideas about inertia found in much organizational theory, and suggests a kind of negative inertia:

*Hypothesis 6:* Countries with low rates of higher-educational expansion in given periods tend to have “corrective” higher rates in subsequent periods.

### THE EXPANSION OF SECONDARY EDUCATION

Arguments from all the traditions discussed earlier link expansion of secondary education to growth of tertiary enrollments. Most common is an obvious functional demographic argument: secondary graduates are a requisite of tertiary expansion, and having more of them is likely to increase tertiary enrollments.

From an institutional point of view, the expansion of secondary education is deeply enmeshed with tertiary expansion, though more as a spurious correlate than a direct causal effect. The global models and discourses that support tertiary expansion *also* affect secondary education (Chabbot 2002; Meyer et al. 1977, 1992b).

Finally, competition and conflict theorists point out that the growth of secondary education reflects increased status competition and leads to credential inflation. Once secondary education is greatly expanded, it becomes necessary to obtain a tertiary degree to maintain

social distinctions and obtain advantages in the stratification system. Thus,

*Hypothesis 7:* Higher education expands more rapidly when secondary education enrollments are high.

### QUANTITATIVE ANALYSIS: DATA AND METHODS

We turn now to quantitative analyses of growth in higher-educational enrollments from 1900 to 2000. Our primary dataset comprises ten decadal cross-national panels that are pooled together. Panels include the lagged dependent variable and other covariates measured 10 years prior to the dependent variable. Compared with cross-sectional designs, this approach reduces concerns regarding the direction of causality. We employ a random effects generalized least squares (GLS) regression model with robust standard errors, because pooling violates the independence assumption of ordinary least squares (OLS) regression. Thus, we include an additional error term ( $U_i$ ) to model the correlated error that occurs with the same country appearing multiple times in our dataset:

$$Y_{i(t2)} = a + bX_{i(t1)} + cY_{i(t1)} + U_i + e_i \quad (1)$$

Variables used in the analyses are described in the following sections. Descriptive statistics can be found in Section B of the *ASR* Online Supplement (<http://www2.asanet.org/journals/asr/2005/toc048.html>).

### DEPENDENT VARIABLE

HIGHER-EDUCATION ENROLLMENTS PER 10,000 CAPITA. UNESCO has collected enrollment data based on country reports since the 1950s (UNESCO 2000, 2004). The critical variable for our purposes is the number of tertiary students within a nation which, according to UNESCO, approximates the students falling into ISCED (International Standard Classification of Education) categories of 5 and 6 (i.e., excluding post-secondary vocational/technical programs). Banks (2001), working from similar sorts of national data, collected enrollment data from the late nineteenth century to around 1980. The Banks codebook states that “every effort

has been made to assemble data on the basis of relevant UNESCO criteria."<sup>5</sup> For the postwar decades in which both datasets are available, enrollment measures are extremely highly correlated (typically over .97). Given the similarity of the measures, we combine them to create a continuous data source covering the entire twentieth century at 10-year intervals.

We standardize enrollments by national population. Enrollment ratios, which are standardized by the relevant population age group, are not available in the early part of the century for many countries. As a check on our results, however, we conduct corollary analyses using tertiary enrollment ratios in the recent period (more detail to follow).

#### **WORLD-LEVEL LONGITUDINAL INDEPENDENT VARIABLES**

**GLOBAL DEMOCRATIZATION.** The global proliferation of democracy is measured by the total number of democracies in the world in any given year, based on data from the Polity IV Dataset (Marshall and Jaggers 2000).<sup>6</sup> The "polity" index identifies nations along a scale ranging from -10 ("strongly autocratic") to +10 ("strongly democratic") based on structural characteristics such as competitive and open elections, constraints on power holders, and the absence of autocratic characteristics such as unlimited executive authority. We also explored measures of global commitment to human rights (alone, and in an index with the democracy measure). Results were similar to those presented in this discussion.

**GLOBAL SCIENTIZATION.** The global expansion of scientific authority is measured by the cumulative number of international scientific

associations in the world, logged (Schofer 1999). These associations serve as a concrete indicator of the historical proliferation of the scientific professions, and the increasing institutionalization of science worldwide. Drori et al. (2003) suggest that the growth of international science associations serves as a useful measure of the expanding scope and authority of science on a global scale.

**RISE OF NATIONAL DEVELOPMENT PLANNING.** The advent of national development planning, a global shift that occurred principally in the 1960s, is measured by the cumulative number of nations in the world that had initiated a national development plan at a given point in time (Hwang 2003).

**STRUCTURATION OF THE WORLD POLITY.** The increasing organizational structure of the world polity is measured by the cumulative number of international nongovernmental associations in the world, logged. Whereas INGO *memberships* are commonly used to measure national linkage to the world polity, the *overall number* of INGOs in the world can be used to indicate the structural expansion of activity in the international sphere (see Schofer and McEneaney 2003).

**INDEX: DEMOCRATIZATION, SCIENTIZATION, DEVELOPMENT PLANNING, AND STRUCTURATION.** The prior four time-varying historical measures are combined into a single index by summing the z-score of each variable. This index captures the interrelated global trends that, we argue, encouraged the worldwide expansion of higher education.

#### **NATIONAL-LEVEL INDEPENDENT VARIABLES**

**WORLD POLITY LINKAGE: INGO MEMBERSHIP.** Scholars have identified INGOs as key carriers of world culture and discourse, and a primary conduit through which the world polity affects nations (Boli and Thomas 1999; Schofer and McEneaney 2003). Nations deeply embedded in networks of international organizations tend to conform to global norms most rapidly (Frank, Hironaka, and Schofer 2000; Schofer 2003). This embeddedness can be measured by the number of membership ties to INGOs held by citizens of a given nation, logged (Institut

<sup>5</sup> Banks (2001) writes, "Insofar as possible, data on preprimary, vocational or technical, part-time, and adult education students have been omitted from the archive listings."

<sup>6</sup> Countries are defined as democratic if they had a "polity" democracy score of four or more, according to the Polity IV Dataset (Marshall and Jaggers 2000). We examined several alternative measures of global democratization (e.g., proportion rather than raw number of democracies, or using a different definition of democracy) and observed similar results.

International de la Paix 1910; League of Nations 1929; Union of International Associations 1986, 1988, 1995, 2000).<sup>7</sup>

**SECONDARY-SCHOOL ENROLLMENT.** The expansion of secondary schooling is measured by students per 10,000 capita (Banks 2001; UNESCO 2000, 2004). Corollary analyses of the contemporary period employ secondary enrollment ratios standardized by the relevant population age group.

**ECONOMIC DEVELOPMENT.** Development is measured by national iron and steel production per capita, logged (Singer and Small 1990). National iron and steel production, a close correlate of national gross domestic product (GDP), is the most commonly used measure of development in studies that require data for the nineteenth or early twentieth centuries. We use GDP per capita, logged, to measure economic development in corollary analyses of the contemporary period (Penn World Table 6.1, see Heston, Summers, and Aten 2002).

**ETHNO-LINGUISTIC FRACTIONALIZATION.** We measure ethnic diversity (and thus the capacity for ethnic competition over access to education) using Taylor and Hudson's (1973) classic measure. The index reflects the probability that any two randomly selected individuals in society belong to different ethno-linguistic groups, and is often used as a proxy for the number of competing groups in society. Taylor and Hudson multiply this probability by 100, yielding an index from zero to 100.

**NO UNIVERSITY SYSTEM (FLOOR DUMMY).** We expect that societies with zero (or very near-zero) enrollments—most likely due to the absence of a domestic university—would be unlikely to experience enrollment expansion in the subsequent period. Thus, we include a dummy variable to control for this potential “floor” effect.

**ENROLLMENT GROWTH IN THE PRIOR PERIOD.** Each panel includes a dependent variable measured at time  $t$ , and the lagged dependent variable measured ten years earlier ( $t-10$ ). We also wish to examine whether growth is correlated *between* panels. Thus, we control for enrollment expansion in the *prior* period, from time  $t-20$  to  $t-10$ . Growth in that prior period is computed as a change score:  $(enrol_{t-10} - enrol_{t-20})/enrol_{t-20}$

**NATIONAL DEMOCRACY.** In addition to examining the impact of *global* trends toward democratization, we also examine the possibility that *national* democratic institutions encourage increased participation in higher education. We measure national democracy using the polity democracy index from the Polity IV Dataset (see earlier discussion of global democratization measure; Marshall and Jaggers 2000).

**STATE CONTROL OF HIGHER EDUCATION.** The measure assesses the extent to which the government maintains control over the higher-education system within a society (Ramirez and Rubinson 1979).<sup>8</sup> These authors base the index on the extent of national (versus regional or local) political, organizational, and resource centralization with respect to the following aspects of higher education: “a) political responsibility for education, b) political control over education, c) political control over admissions, d) political control over curriculum, e) political control over examinations, f) source of funding for students, and g) source of funding for schools.” For instance, nations with very strong centralized ministries that determine curriculum, supply funding, and manage national educational exams would score very high on this index. Countries typified by local funding and control score low.

**COMMUNIST SOCIETY × 1970–1990 DUMMY.** We created a dummy variable coded 1 for

<sup>7</sup> Data on INGO memberships are not available yearly. Gaps in data were estimated by interpolation and, for the period prior to 1910, by extrapolation. The addition of interpolated cases does not alter results.

<sup>8</sup> Lacking time-varying data, we used the 1970 value to characterize societies over the entire century, making the assumption that the variable does not change substantially over time. Results should be interpreted with caution.

Eastern-bloc socialist societies from 1970 to 1990 to address historically specific arguments that those countries limited the expansion of higher education (see earlier discussion).

FORMER COMMUNIST  $\times$  POST-1990 DUMMY. The measure is coded 1 for former socialist societies in the period after 1990. With the demise of the Soviet Union, we expect former constraints on higher education to disappear, yielding rapid growth in post-Soviet societies.

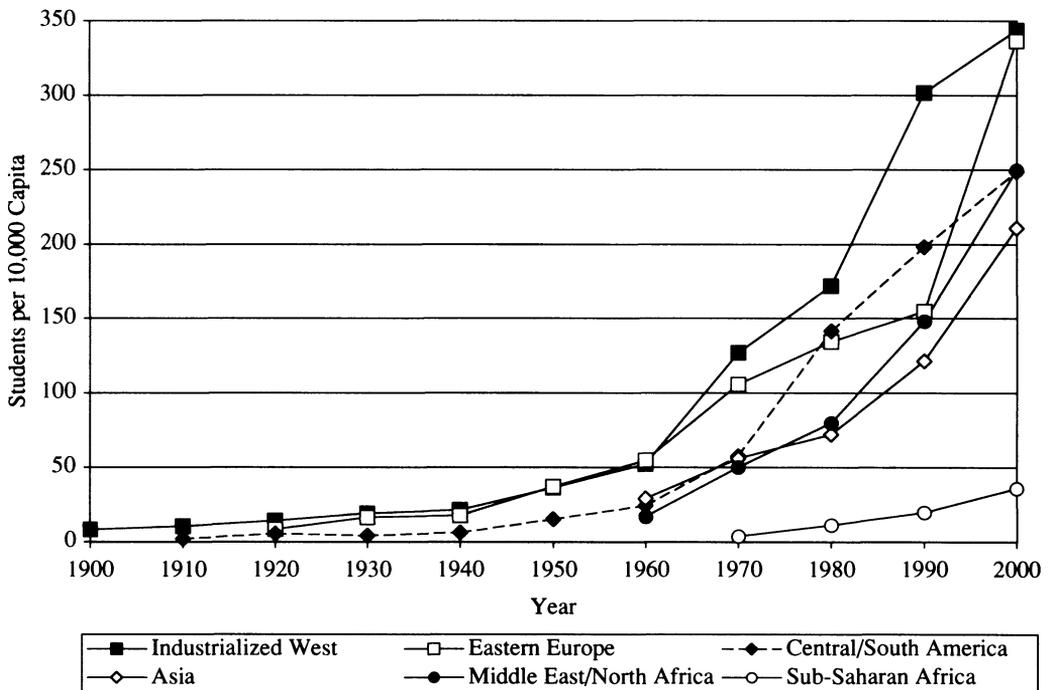
**RESULTS**

**THE TRENDS**

We begin with a descriptive look at enrollment growth over the twentieth century, to explore the extent to which enrollment expansion reflects a common “global” process, or a process that involves merely certain subsets of nations. Figure 3 presents enrollments per capita broken out by world region. We include only cases with data at most points throughout the period of

reporting, and so the curves start at different points in time. The striking feature of the results is how similar the growth curves are between these dramatically different sorts of countries. Enrollment growth accelerates in every type of country after about 1960. Sub-Saharan Africa lags substantially throughout the period, but even there we see that growth rates in the region are high in proportional terms. We also find extremely similar patterns when nations are broken out by other criteria, such as level of development, and in plots of individual countries.

Figure 4 presents coefficients of variation for higher education enrollments by region between 1900 and 2000. The case base grows and becomes more diverse over time as new countries become independent, and so in fact the extent of convergence is understated. Nevertheless, we see that variation among countries decreases over time within each region, and in the world as a whole. Whereas one might expect expansion to be associated with diver-



**Figure 3.** Tertiary Students per Capita, Regional Averages, 1900–2000 (constant cases).

Note: Industrialized West (n = 15), Eastern Europe (n = 11), Central/South America (n = 19), Asia (n = 18), Middle East/North Africa (n = 13), sub-Saharan Africa (n = 38).

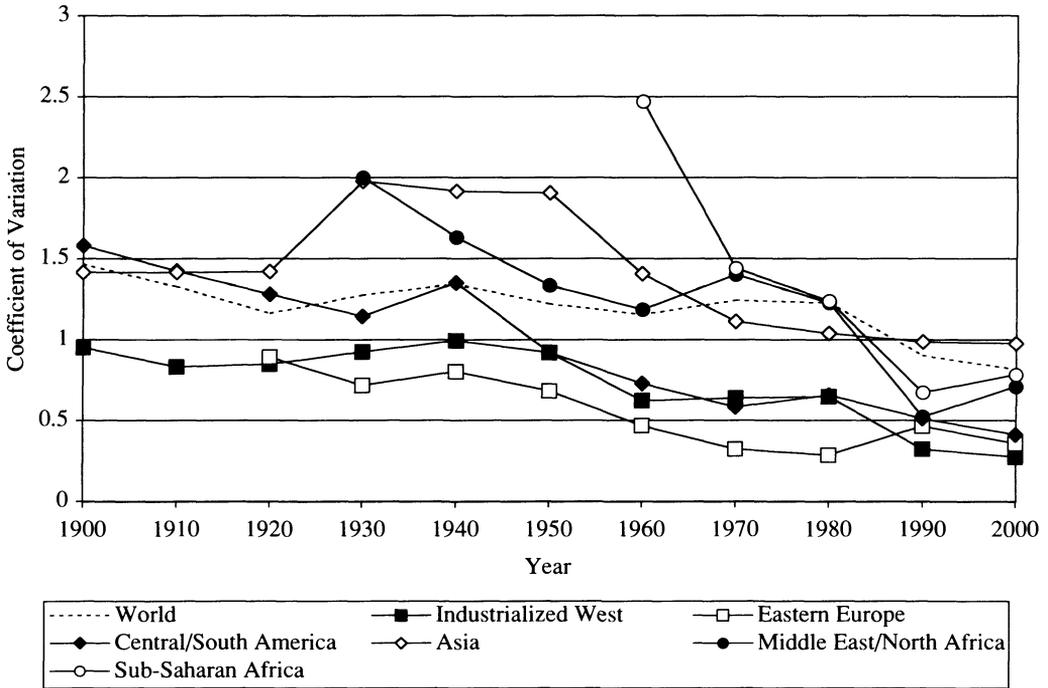


Figure 4. Coefficient of Variation of Higher-Education Enrollment by Region, 1900–2000.

gence and inequality, we instead see increasing isomorphism over time.

We also explored gender differences in participation by looking at disaggregated tertiary enrollment ratios, which are available in the postwar era. Figure 5 presents the global average of enrollment ratios for independent nations from 1950 to 2000. At the start of the period, higher education enrollment ratios were quite low: just over 2 percent for men and less than 1 percent for women in the average country. The initial expansion disproportionately involved men, increasing the gender gap from about 1.5 points to over 3 points. In raw terms, however, the gap begins to shrink starting after 1970, and parity is achieved around 1990. By 2000 the average female enrollment ratio is higher than the male average by 6 points, a difference of almost 25 percent. It is noteworthy that the “new gender gap,” which has recently been observed in studies of industrialized countries, is also evident in our global averages.

The overall trend, however, is similar for men and women. Enrollment ratios grow by more than an order of magnitude over the period, dwarfing the between-gender differences.

These figures paint a picture of universal expansion and increasing global isomorphism. The evidence is broadly consistent with our global institutional argument, and casts doubt upon perspectives that predict divergence or sharp regional differences.

**REGRESSION MODELS**

Tables 1 and 2 present results of random effects GLS regression models with robust standard errors predicting national higher education enrollments per capita. Table 1 examines our main global-level argument, along with key national-level control variables. Models 1 to 4 introduce our four indicators of the changed model of society in which higher education could be viewed as universally valuable for individuals and societies (Hypothesis 4). In Model 1, we see that global democratization has a strong positive and significant effect on higher-education enrollment. Education expands faster in time periods when democracy is more prevalent in the world. Model 2 shows a positive and significant effect of national development planning. As nations mobilize around

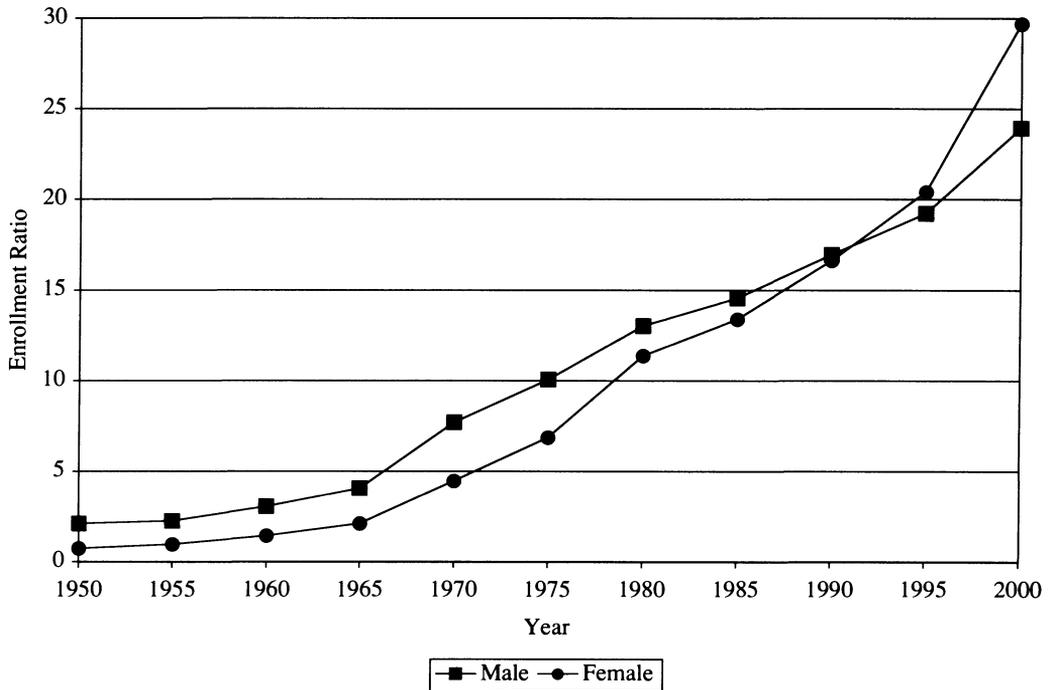


Figure 5. Higher-Education Enrollment Ratio by Gender, Global Average of Independent Nations, 1950–2000.

modern conceptions of national development, enrollments grow faster. In Model 3, we see a positive, significant effect of the global expansion of science. Finally, the intensified structure of the world polity, measured by the proliferation of international organizations, has a positive and significant effect on tertiary enrollments.

Model 5 includes an index that combines the historical variables from the prior four models: democratization, scientization, the rise of development planning, and the increased structuration of the world polity itself. Like each component, the overall index has a strong positive and significant effect on higher-education enrollments, consistent with our central argument (Hypothesis 4). As these global trends emerge and a new worldview becomes taken for granted—a process that accelerates in the 1950s, 1960s, and 1970s—nations and individuals initiate a massive shift toward greater enrollments in tertiary education.<sup>9</sup>

<sup>9</sup> The “world index” variable remains significant when compared against other baseline hypotheses,

Table 1 also includes a variable for INGO membership (logged), the standard measure of national linkage to global organizations and discourses. INGO membership has a positive and significant effect on tertiary enrollments. Consistent with the prior neo-institutional literature, societies most deeply embedded in the organizational structures of world society are influenced the most. Hypothesis 5 is supported.

In standardized terms, the two main neo-institutional variables are the largest statistically significant coefficients in Model 5.<sup>10</sup> Our world-level index (of democratization, scientization, etc) and the INGO linkage variable have a greater impact than conventional predictors

such as a linear “time” variable (see section C of the *ASR* Online Supplement: <http://www2.asanet.org/journals/asr/2005/toc048.html>).

<sup>10</sup> STATA 8.0 cannot produce standardized coefficients in regression models with robust standard errors. Comments about standardized coefficients were therefore based on models with ordinary standard errors.

**Table 1.** Random Effects GLS Pooled 10-Year Panel Regression Analyses of Higher Education Enrollments per Capita, 1900–2000: Models 1 to 5

	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Basic Controls</b>					
Lagged dependent variable	.90*** (.06)	.92*** (.06)	.92*** (.06)	.91*** (.06)	.91*** (.06)
No university system	7.46 (4.58)	6.17 (4.64)	5.92 (4.61)	5.64 (4.61)	5.48 (4.62)
<b>World-level Variables</b>					
Global democratization	.40*** (.11)	—	—	—	—
Rise of national development planning	—	.16*** (.03)	—	—	—
Global scientization	—	—	7.77*** (1.46)	—	—
Structuration of the world polity	—	—	—	9.47*** (1.79)	—
Index of world-level variables	—	—	—	—	3.25*** (.61)
<b>National-Level Variables</b>					
INGO memberships (log)	5.37*** (1.47)	4.34** (1.48)	4.10** (1.52)	3.92** (1.52)	3.76** (1.50)
Secondary enrollment per 10,000 capita	.06*** (.01)	.07*** (.01)	.07*** (.01)	.07*** (.01)	.06*** (.01)
Economic development	3.14*** (.94)	3.00*** (.93)	3.03*** (.93)	3.08*** (.93)	3.21*** (.93)
Ethno-linguistic fractionalization	-.15* (.06)	-.15* (.06)	-.14* (.06)	-.15* (.06)	-.15* (.06)
Constant	-5.17 (8.16)	3.54 (8.96)	-14.83 (8.29)	-57.47** (11.85)	22.89* (10.26)
Observations	687	687	687	687	687
Adjusted R <sup>2</sup>	.82	.81	.81	.81	.81

Note: Robust standard errors appear in parentheses. GLS = generalized least squares; INGO = international nongovernmental organization.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$  (one-tail for directional hypotheses noted above; otherwise two-tail test).

such as secondary education and economic development.

Models in Table 1 also include a measure of secondary education expansion, which has a positive and highly significant effect on tertiary enrollments. Hypothesis 7 is supported. As discussed earlier, several arguments predict this effect, including demographic arguments, competition/credential inflation arguments, and the neo-institutional prediction that secondary education will expand along with tertiary expansion due to global cultural models that stress education. We cannot directly adjudicate among these claims with the available data.<sup>11</sup>

We also see positive and significant effects of economic development running across the models in Table 1 (but note contrary results in Table 3). Findings in Table 1 are consistent with a variety of functional arguments (discussed earlier), ranging from classical modernization theory to narrow economic arguments about costs. We do not have leverage to adjudicate among them. Evidence from longitudinal studies of core countries shows little effect of societal industrialization or other structural economic changes

secondary education is *excluded* from the model. Secondary enrollments may reflect national subscription to world pro-educational models, and thus be a direct consequence of the “world index.” If so, then the positive secondary-enrollment effect partly reflects a neo-institutional dynamic.

<sup>11</sup> In exploratory analyses we noted that the effect of the “world index” is substantially larger when

associated with development, casting doubt on classic functionalisms (Windolf 1997). Higher education is known to be expensive, however, and thus it is plausible that growth would be slower in resource-poor contexts.

The ethno-linguistic fractionalization variable has a negative and significant effect on higher education: tertiary enrollments grow slowly in ethnically diverse societies and faster in homogenous ones. This contradicts the common notion that competing status groups generate expansion and inflation. Rather, it may be the case that powerful ethnic/linguistic groups are successfully able to limit participation by others, slowing the pace of expansion (Ralph and Rubinson 1980). For instance, the Sinhalese used their political dominance in Sri Lanka to enact policies that systematically limited enrollment among a competing ethnic group, the Tamils (Rotberg 1999). Similar racial dynamics occurred in the United States, South Africa, and Rwanda. In short, group competition may serve to limit expansion, rather than hasten it.

Finally, the "floor" dummy, indicating nations without a university system, has a positive but nonsignificant effect. We presumed that the absence of a university system would sharply limit enrollments. Yet, the effect is null: societies without university systems do not seem to be laggards. Historical sources suggest that this absence of a lag may be due to the large amount of assistance that newly independent ex-colonies received from former colonial powers and the international community. For instance, UNESCO organized conferences in the early 1960s in which Britain and France committed to provide resources to rapidly create and expand universities in former colonies that lacked them (UNESCO 1963).

Table 2 pursues a series of more specific hypotheses. Model 6 includes a measure of tertiary growth in the *prior* decade. The expectation, stated in Hypothesis 6, is that laggards will experience pressure to "catch up" and conform to world models, yielding a negative effect. Indeed, prior growth has a negative and significant effect on enrollment expansion, suggesting a tendency toward conformity among societies.<sup>12</sup> This is plausibly the result of nations

existing in a world with a shared global model of education and common standards of "success." Nations deemed inadequate by global standards (indicated in reports by UNESCO, for instance) tend to accelerate enrollments, while those with very high enrollments regress to the collective mean.<sup>13</sup> Negative autocorrelation runs sharply counter to most domestic arguments (historical, economic, cultural, etc.), which typically predict or imply positive autocorrelation.

In Model 7, we see that the political democracy variable has a positive but nonsignificant effect on tertiary enrollments. We included this variable to distinguish between *national* democratization and the broader *global democratization* variable that is part of our world index. Although the effect is often positive, it falls short of significance. In comparison, the effect of *global* democratization is consistently positive and significant, whether alone or as part of the world index. In other words, education expands not because a *particular society* democratizes, but because of *global* trends regarding democracy and human rights. As new global models of democratic equality become taken for granted, even monarchial or otherwise highly undemocratic societies like Bhutan and Saudi Arabia begin to allow women, minorities, and the lower classes to participate in higher education.

Next, we examine the impact of state control. While many centralized regimes have used their control to expand education, centralized control allows the possibility of constraints on educational expansion, which may be done for reasons such as costs, strict manpower planning, desire to engage in political exclusion, and so on. Our measure of state control over the tertiary education system has a small negative and significant effect on educational expansion. Hypothesis 3 is supported, consistent with the classic organizational studies of science and higher education.

Model 9 examines the specific trajectory of communist societies, which represent an extreme case of the previous argument. Results

---

pronounced among poor nations where resource constraints are greatest.

<sup>13</sup> Of course, expectations about what constitutes a "proper" level of enrollment continue to rise throughout the period.

---

<sup>12</sup> The finding does not appear to reflect resource constraints. The autocorrelation effect is not more

**Table 2.** Random Effects GLS Pooled 10-Year Panel Regression Analyses of Higher Education Enrollments per Capita, 1900–2000: Models 6 to 10

	Model 6	Model 7	Model 8	Model 9	Model 10
Lagged Dependent Variable	.90*** (.06)	.90*** (.06)	.90*** (.06)	.93*** (.06)	.90*** (.07)
No University System	1.37 (5.23)	4.31 (4.03)	5.39 (4.71)	5.13 (4.40)	2.25 (4.78)
Index of World-level Variables <sup>a</sup>	3.54*** (.67)	3.34*** (.73)	3.54*** (.64)	3.11*** (.59)	3.37*** (.77)
INGO Memberships (log)	3.02* (1.62)	3.00* (1.33)	3.83** (1.51)	4.12** (1.50)	4.12** (1.56)
Secondary Education per 10,000 Capita	.07*** (.01)	.07*** (.01)	.06*** (.01)	.06*** (.01)	.06*** (.02)
Economic Development	3.02*** (.97)	3.26*** (.93)	3.30*** (.93)	2.98*** (.90)	2.95*** (.91)
Ethno-linguistic Fractionalization	-.16* (.07)	-.15* (.06)	-.18** (.06)	-.15* (.06)	-.19** (.07)
Enrollment Growth in Prior Period	-.96*** (.21)	—	—	—	-.80* (.35)
Polity Democracy Score	—	.16 (.33)	—	—	-.16 (.34)
State Control of Education	—	—	-.02** (.01)	—	-.03** (.01)
Communist × 1970–1990	—	—	—	-31.58** (10.50)	-27.98* (11.16)
Former Communist × Post-1990	—	—	—	113.94** (43.21)	116.59** (43.27)
Constant	28.14* (11.33)	26.83** (10.17)	34.62** (11.32)	20.47* (10.02)	35.78** (12.87)
Observations	629	674	687	687	619
Adjusted R <sup>2</sup>	.81	.82	.82	.82	.82

Note: Robust standard errors appear in parentheses. GLS = generalized least squares; INGO = international nongovernmental organization. Higher education enrollments with additional nation-level controls are analyzed.

<sup>a</sup> Democratization, scientization, development planning, and world polity structuration.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$  (one-tail for directional hypotheses noted above; otherwise two-tail test).

show that enrollments were significantly lower behind the Iron Curtain between 1970 and 1990. After 1990, of course, centralized controls broke down. Immediately following the demise of the Soviet Union, the former republics (and Russia itself) rapidly “caught up” and fell in line with global norms.<sup>14</sup>

Model 10 includes the full set of variables. Results are essentially unchanged.

<sup>14</sup> The rapidity of expansion in Eastern Europe is striking, considering the economic difficulties experienced across the region. It is hard to see this expansion as linked to functional demands of the labor market.

### DIFFERENCES OVER TIME

We split our sample into “early” and “late” periods using various mid-century cutoffs to identify fluctuations in effects over time. Our main findings regarding INGO linkage and the world index remain consistent in direction and significance. The coefficients for these neo-institutional variables, however, are *much* bigger after 1950, growing by a factor of five or more. This makes sense, given the intensification of the world polity after World War II. The effect of secondary education is also positive and significant in both time periods, and modestly larger in the recent era.

The negative effect of ethno-linguistic diversity appears only in the postwar period, presumably due to the addition of former colonies

into the sample, which are the most ethnically diverse countries in the world. In the early part of the century, where the sample is dominated by Europe and Latin America, the effect is generally positive and occasionally borders on significance.

The effect of economic development is weaker in the early period, remaining positive but falling far short of statistical significance. This may be due to a number of wealthy countries (e.g., Germany) maintaining strong limits on tertiary expansion.

#### **REGRESSION DIAGNOSTICS, MODEL SPECIFICATION, AND ALTERNATE MEASURES**

Further analyses examined sources of error, bias, and potential alternative explanations. Regression diagnostics were generally unremarkable, except as noted. We explored a wide range of model specifications and additional control variables, including: primary enrollment ratios, population, population growth, political autocracy, colonial history and dominant colonial power, national religion and religious composition, civil war, the World Wars, the Great Depression, international trade, world system position, OECD (Organization for Economic Cooperation and Development) membership, and others. The additional analyses are not included in Tables 1 and 2 either because effects were not statistically significant or because they significantly reduced the sample size due to missing data. In any case, none of these variables altered our main findings.

As a further check on our results, we conducted analyses from 1970 to 2000, when higher quality data was available.<sup>15</sup> For instance, we were able to use gross tertiary enrollment ratios rather than per capita measures, and GDP as our measure of economic development rather than iron and steel production. In these analyses, we were able to examine a wider range of independent variables, including foreign direct investment, Gini income inequality coefficients, gender enrollment ratios, measures of technological innovation (e.g., patents), R&D (research & development) personnel and expenditure,

and others. The only limitation of the 1970–2000 analyses is that we cannot effectively examine the “world index” and related global trends, as they are severely truncated. Most of the variation in those variables occurs prior to 1970, and thus we do not include them in the post-1970 analyses.

Table 3 presents results from the contemporary period with improved measures. Our basic findings regarding INGO linkage and secondary enrollments remain stable throughout Table 3. Ethno-linguistic fractionalization maintains a negative sign that is typically significant (or nearly so). The notable difference is a weakening of the economic development effect, which is not significant in any models.<sup>16</sup> We do find an economic development effect when secondary enrollment is excluded from the model, suggesting the latter mediates the former. There is no effect of GDP per capita, however, over and above the effect of secondary enrollment.

Table 3 explores a variety of additional variables. We first examine domestic economic inequality, measured by Gini coefficients. Inequality has a negative but nonsignificant effect on subsequent tertiary-enrollment expansion. We also look at two measures of globalization: trade openness and foreign direct investment (FDI). Both have small positive effects, the latter of which is statistically significant. It may be the case that FDI brings labor force opportunities that provide incentives for increased participation in higher education.

Finally, we examine two measures of technological innovation and the scientific labor force: patents per million capita (log), and the number of scientists in R&D per million capita (log). Neither variable is associated with higher education expansion, casting doubt on fashionable arguments about the “knowledge society.” This finding makes sense given that education expands very rapidly everywhere, even in very poor nations that possess little in the way of high technology, innovation, or a knowledge-based economy.

<sup>15</sup> We pooled five-year panels to maintain a large sample size.

<sup>16</sup> The disappearance of the GDP effect is not due to the restricted time period of the analysis. Rather, it occurs as we improve our measures—specifically, when we use enrollment ratios as the dependent variable.

**Table 3.** Random Effects GLS Pooled 5-Year Panel Regression Analyses: Higher Education Enrollment Ratios, 1970–2000

	Model 1	Model 2	Model 3	Model 4	Model 5
Lagged Dependent Variable	1.08*** (.04)	1.10*** (.03)	1.08*** (.03)	1.06*** (.03)	1.06*** (.03)
No University System	1.57* (.62)	1.10*** (.31)	1.50*** (.38)	.84 (.45)	1.29** (.41)
INGO Membership (log)	.52* (.31)	.70*** (.21)	.62*** (.19)	.65** (.26)	.66* (.28)
Secondary Enrollment Ratio	.04* (.02)	.03* (.01)	.03* (.02)	.04* (.02)	.03* (.02)
Economic Development	.58 (.60)	.20 (.38)	.55 (.38)	-.01 (.45)	.61 (.39)
Ethno-linguistic Fractionalization	-.01 (.01)	-.01 (.01)	-.01 (.01)	-.01* (.01)	-.01* (.01)
Political Democracy Score	-.10 (.05)	-.05 (.03)	-.06 (.03)	-.08* (.04)	-.05 (.04)
Communist × 1970–1990	-3.98*** (1.02)	-3.16*** (.72)	-2.94*** (.54)	-3.95** (.77)	-3.45** (.78)
Former Communist × Post-1990	6.21** (2.01)	6.85*** (1.68)	6.53*** (1.75)	4.11* (2.41)	3.72 (2.43)
Gini Inequality Index	-.01 (.03)	—	—	—	—
Trade Openness	—	.005 (.005)	—	—	—
Foreign Direct Investment (% GDP)	—	—	.17* (.08)	—	—
Patents per million people (log)	—	—	—	.36 (.21)	—
Scientists & Engineers in R&D <sup>a</sup>	—	—	—	—	.04 (.17)
Constant	-6.17 (4.22)	-5.23* (2.55)	-7.08* (2.84)	-4.00 (3.39)	-7.28* (3.02)
Observations	341	544	498	412	450
Adjusted R <sup>2</sup>	.93	.94	.95	.94	.94

Note: Robust standard errors appear in parentheses. GLS = generalized least squares; INGO = international nongovernmental organization; GDP = gross domestic product; R&D = research and development.

<sup>a</sup> Per million people.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$  (one-tail for directional hypotheses noted above; otherwise two-tail test).

### GENDER AND HIGHER-EDUCATION PARTICIPATION

While a full treatment of gender must await a future paper, we conducted basic analyses on male and female enrollment ratios in the recent period to explore the issue (for detailed analyses of female enrollment expansion, see Bradley and Ramirez 1996; Ramirez and Wotipka 2001). Table 4 presents regression results broken out by gender. The main impression, which echoes Figure 5, is of similar patterns across gender. The same general dynamics responsible for male enrollment also affect female enrollment.

One subtle difference is that the lagged dependent variable is a more powerful predictor of future enrollments for women than for men. A country's prior history matters more for women—perhaps reflecting the powerful legacies of institutionalized discrimination (versus progressive inclusiveness). We explored this issue further by examining the effect of prior enrollment ratios (i.e., female enrollments as a proportion of the total) on subsequent expansion. While the effect is positive, consistent with the idea that growth was slower where there was a history of sharp inequality, it is not significant. Beyond that, the gender differences

**Table 4.** Random Effects GLS Pooled 5-Year Panel Regression Analyses: Higher Education Enrollment Ratios by Gender, 1970–2000

	Male Enrollment	Female Enrollment
Lagged Dependent Variable	.94*** (.03)	1.08*** (.04)
No University System	.73* (.32)	1.27*** (.34)
INGO Membership (log)	1.08*** (.28)	.87** (.33)
Secondary Enrollment Ratio	.04** (.02)	.03* (.02)
Economic Development	.03 (.38)	.40 (.38)
Ethno-linguistic Fractionalization	-.02* (.01)	-.02** (.01)
Political Democracy Score	-.02 (.03)	.02 (.03)
Communist × 1970-1990	-3.85*** (.69)	-3.12*** (.54)
Former Communist × Post-1990	6.69*** (1.97)	9.88*** (3.02)
Constant	-4.89 (2.83)	-6.61* (2.88)
Observations	580	578
Adjusted R <sup>2</sup>	.92	.94

Note: Robust standard errors appear in parentheses. GLS = generalized least squares; INGO = international nongovernmental organization.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$  (one-tail for directional hypotheses noted above; otherwise two-tail test).

in Table 4 are rather small. This is consistent with our broader argument about the importance of global processes, such as democratization and human rights. Gender equity issues emerged on the global stage intertwined with a broader package of concerns about racial and class-based discrimination, equality, and human rights in general. Consequently, the incorporation of women into universities roughly coincides with various other expansions that also affect male enrollments—e.g., incorporation of minorities and the lower classes.

## DISCUSSION AND CONCLUSIONS

Our cross-national analyses of higher-educational enrollments show effects consistent with several standard theories. Higher education expands faster in countries with expanded secondary education systems, as predicted by functional, conflict/competition, and neo-institutional theories. Enrollments also expand faster in countries with strong links to the international system or the “world polity,” consistent

with neo-institutional theory. Economic development tends to have a positive effect on enrollments, but the effect is not significant in the early part of the century or in models with improved measures that control for secondary enrollments.

Higher-education expansion is slowed in countries that are ethnically and linguistically diverse, contrary to the idea that competing status groups generate inflation and expansion. Rather, it appears that competition leads to disenfranchisement and/or exclusion of particular groups. Also, enrollment expansion is often slowed when educational systems are under centralized control, because governments have the capacity to limit growth.

Moreover, we observe important effects that are less well theorized in the literature. Enrollments increase much more rapidly in the period after about 1960, and leap up in every type of country that we are able to distinguish. We explain this expansion in terms of global institutional changes linked to the rise of a new model of society: increasing democratization

and human rights, scientization, and the advent of development planning. These processes, along with the structuration of the world polity itself, prove to be powerful predictors of educational expansion, yielding large standardized coefficients in our models.

In this period, the preferred models of the state, society, and the proper stratification system changed dramatically. A world dominated by more traditional elites—landowners, business owners, political and military machines—was replaced by one in which a new set of elites (and older ones reconstructed) were built around schooled knowledge. Personnel selection routines as well as the nature of authoritative knowledge were transformed (Meyer 1977). This occurred not only in the developed and core countries suggested by classical theories but also in every type of country. The university becomes a central, not a specialized, institution—and levels of enrollment arise in the most peripheral areas that transcend anything imagined in an earlier period.

It is important to understand that this massive tertiary educational expansion occurs in institutions with a great deal of isomorphism around the world. The same subjects are taught with the same perspectives leading to very similar degrees and to credentials that take on worldwide meaning (Drori and Moon, forthcoming; Frank and Gabler 2006; Mazza, Sahlin-Andersson, and Pedersen 1998). The process is most advanced in Europe, under pressures from the Bologna Agreement, which creates a “European Higher Education Area” and encourages common educational definitions, credentials, and standards. Yet this trend toward isomorphism is occurring worldwide, such that flows of students, academic subjects, research agendas, and certified personnel are now treated as routine.

We can think of this as the triumph of optimistic rationalized ideologies—of science, democratic participation, and national development—in the contemporary world. Countries with educated people and highly schooled elites could build a future out of expanded “human capital” to manage society rationally. Indeed, the expansion of education has clearly been involved in the extraordinary modern expansion of the professions and other formerly elite occupations. So, whether or not relative social mobility rates have been greatly increased, masses of

people in the world experience upward mobility on more absolute scales.

It is also possible to think of education in a more critical way, as was suggested in the prescient reflections of Cohen (1970) some decades ago. The modern world is knit together by elites more schooled in a cosmopolitan world culture than in their own local ones, and linked more tightly to each other than to their own populations.

Rationalization fueled by higher educational expansion penetrates almost everywhere. Customary family arrangements are undercut by elite claims about the human rights of women and children (Boyle 2002). Local agricultural practices are destroyed or reorganized by world ecological ideologies (Frank et al. 2000). Local production systems lose access to credit because of worldwide pressures for transparency (Drori et al. 2003). Finally, local economic activity is reorganized in terms of neoliberal policies as elites are trained in fashionable economic ideas (Gourinchas and Babb 2002).

Whether we take a positive or a critical view, the expansion of higher education produces a world in which every society has a schooled population and institutions that function as a greatly expanded set of receptor sites collecting ideas and practices from world society (Frank et al. 2000). Whereas neo-institutional scholars have emphasized organizational structures (e.g., INGOs) as a primary mechanism for sustaining and diffusing world culture, surely the university plays a similar role. Indeed, universities reflect the themes—and the contradictions—of world culture. They produce individuals who study neoclassical economics and wish to work for the WTO (World Trade Organization), just as they produce sociologists who decry the WTO’s evils. Yet, such people are linked by a (mostly) common cultural frame. This integrated population of individuals with common schooled status and common information can obviously generate a great deal of global integration, as illustrated by the rapidly expanding world society of associations and social movements (Boli and Thomas 1999). It can also serve as a mechanism for greatly enhanced social conflict in a world with so much actual inequality and diversity. Inequalities seen in light of a common universalistic culture and schooled stratification system are increasingly difficult to legitimate—and formerly little-noted cultural

differences can sustain conflict-ridden world movements (e.g., Boyle 2002).

Whatever assessment we make, the dramatic changes analyzed in this paper are very clear. Beyond the national factors affecting educational expansion that are normally discussed, global factors are obviously involved. They impact educational growth in every part of the world, driving massive expansion. The result is a highly expanded, and essentially global, system of higher education.

*Evan Schofer is Assistant Professor of Sociology at the University of Minnesota. His cross-national research on science and educational systems has appeared in American Sociological Review, Social Forces, and in a co-authored book entitled Science in the Modern World Polity: Globalization and Institutionalization (Stanford University Press, 2003). His work traces the historical expansion of education and science, and examines how these institutions serve to rationalize society, reshaping political and economic activity. He also conducts research in the areas of comparative political sociology and globalization on topics such as political participation and the global environmental movement. He is currently engaged in a new project exploring the structural factors that shape associational life around the world.*

*John W. Meyer is Professor of Sociology, emeritus, at Stanford University. He works on studies of the impact of world societal models on national social structures. Currently, his projects focus on the global rise and impact of human rights education (with Francisco Ramirez and others), and twentieth-century transformations in the nature of university-based knowledge and instruction (with David Frank). A collaborative collection (with Gili Drori, Hoky Hwang, and others) focusing on the impact of globalization on the expansion of formal organization will be published by Oxford University Press in 2006.*

## REFERENCES

- Baker, David. P., Helmut Köhler, and Manfred Stock. 2004. "Socialist Ideology and the Contraction of Higher Education: Institutional Consequences of State Manpower and Education Planning in the Former East Germany, 1949 to 1989." Berlin, Germany: Max Planck Institute for Human Development.
- Banks, Arthur S. 2001. *Cross-National Time-Series Data Archive* [dataset]. Binghamton, NY: Computer Systems Unlimited.
- Ben-David, Joseph and Abraham Zloczower. 1962. "Universities and Academic Systems in Modern Societies." *European Journal of Sociology* 3:45–85.
- Berg, Ivar E. 1970. *Education and Jobs: The Great Training Robbery*. New York: Praeger.
- Boli, John. 1980. "Global Integration and the Universal Increase in State Dominance, 1910–1970." Pp. 77–107 in *Studies of the Modern World-System*, edited by A. J. Bergesen. New York: Academic.
- Boli, John and George M. Thomas. 1999. *Constructing World Culture: International Nongovernmental Organizations since 1875*. Stanford, CA: Stanford University Press.
- Bourdieu, Pierre and Jean-Claude Passeron. 1977. *Reproduction in Education, Society, and Culture*. London, England: Sage.
- Boyle, Elizabeth H. 2002. *Female Genital Cutting: Cultural Conflict in the Global Community*. Baltimore, MD: Johns Hopkins University Press.
- Bradley, Karen and Francisco O. Ramirez. 1996. "World Polity and Gender Parity: Women's Share of Higher Education, 1965–1985." *Research in Sociology of Education and Socialization* 11:63–91.
- Chabbott, Colette. 1999. "Development INGOs." Pp. 222–48 in *World Polity in Formation: A Century of International Non-Governmental Organization*, edited by J. Boli and G. Thomas. Stanford, CA: Stanford University Press.
- . 2002. *Constructing Education for Development: International Organizations and Education For All*. London, England: Taylor and Francis.
- Clark, Roger. 1992. "Multinational Corporate Investment and Women's Participation in Higher Education in Noncore Nations." *Sociology of Education* 65:37–47.
- Cohen, Yehudi. 1970. "Schools and Civilization States." Pp. 55–147 in *The Social Sciences and the Comparative Study of Education*, edited by J. Fischer. Scranton, NY: Industrial Textbook.
- Collins, Randall. 1971. "Functional and Conflict Theories of Educational Stratification." *American Sociological Review* 36:1002–19.
- . 1979. *The Credential Society: An Historical Sociology of Education and Stratification*. New York: Academic.
- Dale, Roger and Susan Robertson. 2002. "The Varying Effects of Regional Organizations as Subjects of Globalization of Education." *Comparative Education Review* 46:10–36.
- Dent, Harold Collett. 1961. *Universities in Transition*. London, England: Cohen and West.
- Djelic, Marie-Laure. 1998. *Exporting the American Model: The Postwar Transformation of European Business*. Oxford, England: Oxford University Press.
- Drori, Gili S., John W. Meyer, and Hoky Hwang,

- eds. 2006. *Globalization and Organizations*. Oxford, England: Oxford University Press.
- Drori, Gili, John W. Meyer, Francisco O. Ramirez, and Evan Schofer. 2003. *Science in the Modern World Polity: Institutionalization and Globalization*. Stanford, CA: Stanford University Press.
- Drori, Gili S. and Hyeoung Moon. Forthcoming. "The Changing Nature of Tertiary Education: Neo-Institutional Perspective on Cross-National Trends in Disciplinary Enrollment, 1965–1995." In *The Impact of Comparative Education Research on Institutional Theory*, edited by D. P. Baker and A. W. Wiseman. International Perspectives on Education and Society Series. Philadelphia, PA: Elsevier Science.
- Fiala, Robert and Audri Gordon Lanford. 1987. "Educational Ideology and the World Educational Revolution, 1950–1970." *Comparative Education Review* 31:315–32.
- Frank, David J. and Jay Gabler. 2006. *Reconstructing the University: Worldwide Changes in Academic Emphases over the Twentieth Century*. Stanford, CA: Stanford University Press.
- Frank, David J., Ann M. Hironaka, and Evan Schofer. 2000. "The Nation State and the Natural Environment, 1900–1995." *American Sociological Review* 65:96–116.
- Frank, David J., John W. Meyer, and David Miyahara. 1995. "The Individualist Polity and the Prevalence of Professionalized Psychology: A Cross-National Study." *American Sociological Review* 60:360–77.
- Freeman, Richard. 1976. *The Overeducated American*. New York: Academic.
- Gourinchas, Marion Fourcade and Sarah Babb. 2002. "The Rebirth of the Liberal Creed: Paths to Neoliberalism in Four Countries." *American Journal of Sociology* 107:533–79.
- Harbison, Frederick and Charles A. Myers. 1964. *Education, Manpower, and Economic Growth: Strategies of Human Resource Development*. New York: McGraw-Hill.
- Heston, Alan, Robert Summers, and Bettina Aten. 2002. *Penn World Table Version 6* [dataset]. Philadelphia, PA: Center for International Comparisons at the University of Pennsylvania.
- Hofstadter, Richard. 1963. *Anti-intellectualism in American Life*. New York: Knopf.
- Hwang, Hokyū. 2003. "Planning Development: The State, Globalization, and Shifting Locus of Planning." Ph.D. dissertation, Department of Sociology, Stanford University, Stanford, CA
- Institut International de la Paix. 1910. *Annuaire de la vie Internationale* [Directory of the International Life]. Paris, France: Institut International de la Paix.
- Jedell, Hugh. 1931. "Warns Germany on Overeducation: Sees Economic Waste." *New York Times*, November 1, p. 56.
- Jepperson, Ronald L. 2002. "Political Modernities: Disentangling Two Underlying Dimensions of Institutional Differentiation." *Sociological Theory* 20:61–85.
- League of Nations. 1929. *Handbook of International Organizations*. Geneva, Switzerland: League of Nations.
- Lenhardt, Gero and Manfred Stock. 2000. "Hochschulentwicklung und Bürgerrechte in der BRD und der DDR." *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 52:520–40.
- Marshall, M. G. and K. Jagers. 2000. *Polity IV Project: Political Regime Characteristics and Transitions, 1800–1999* [dataset]. College Park, MD: Center for International Development and Conflict Management.
- Mazza, Carmelo, Kerstin Sahlin-Andersson, and Jesper Strandgaard Pedersen. 1998. "MBA: European Constructions of an American Model." *Score Report 4*, Stockholm Centre for Organizational Research (SCORE), Stockholm University, Sweden.
- Meyer, John W. 1977. "The Effects of Education as an Institution." *American Journal of Sociology* 83:55–77.
- Meyer, John W., David Kamens, Aaron Benavot, and Young Kyoung Cha. 1992a. *School Knowledge for the Masses: World Models and National Primary Curricular Categories in the 20th Century*. Washington, DC: Falmer.
- Meyer, John W., Francisco O. Ramirez, Richard Rubinson, and John Boli-Bennett. 1977. "The World Educational Revolution, 1950–1970." *Sociology of Education* 50:242–58.
- Meyer, John W., Francisco O. Ramirez, and Yasemin N. Soysal. 1992b. "World Expansion of Mass Education, 1870–1980." *Sociology of Education* 65:128–49.
- Morris, Martina and Bruce Western. 1999. "Inequality in Earnings at the Close of the Twentieth Century." *Annual Review of Sociology* 25:623–57.
- Paulsen, Friedrich. [1893] 1906. *The German Universities: Their Character and Historical Development*. New York and London, England: Macmillan.
- Ralph, John H. and Richard Rubinson. 1980. "Immigration and the Expansion of Schooling in the United States, 1890–1970." *American Sociological Review* 46:943–54.
- Ramirez, Francisco O. and Richard Rubinson. 1979. "Creating Members: The Political Incorporation and Expansion of Public Education." Pp. 72–84 in *National Development and the World System*, edited by J. Meyer and M. Hannan. Chicago, IL: University of Chicago Press.
- Ramirez, Francisco O., Yasemin Soysal, and Suzanne Shanahan. 1998. "The Changing Logic of Political Citizenship: Cross-National Acquisition of

- Women's Suffrage." *American Sociological Review* 62:735-45.
- Ramirez, Francisco O. and Christine Min Wotipka. 2001. "Slowly But Surely? The Global Expansion of Women's Participation in Science and Engineering Fields of Study, 1972-92." *Sociology of Education* 74:231-51.
- Riddle, Phyllis. 1990. "University and State: Political Competition and the Rise of Universities, 1200-1985." Ph.D. dissertation, School of Education, Stanford University, Stanford, CA.
- . 1993. "Political Authority and University Formation in Europe, 1200-1800." *Sociological Perspectives* 36:45-62.
- Rotberg, Robert I., ed. 1999. *Creating Peace in Sri Lanka: Civil War and Reconciliation*. Washington, DC: Brookings Institution Press, 1999.
- Rubinson, Richard and Bruce Fuller. 1992. "Specifying the Effects of Education on National Economic Growth." Pp. 101-15 in *The Political Construction of Education*, edited by B. Fuller and R. Rubinson. New York: Praeger.
- Schofer, Evan. 1999. "Science Association in the International Sphere 1875-1990: The Rationalization of Science and the Scientization of Society." Pp. 249-266 in *World Polity in Formation: A Century of International Non-Governmental Organization*, edited by J. Boli and G. Thomas. Stanford, CA: Stanford University Press.
- . 2003. "The Global Institutionalization of Geological Science, 1800-1990." *American Sociological Review* 68:730-59.
- Schofer, Evan and Ann Hironaka. 2005. "World Society and Environmental Protection Outcomes." *Social Forces* 84:25-47.
- Schofer, Evan and Elizabeth McEneaney. 2003. "Methodological Strategies and Tools for the Study of Globalization." Pp. 43-76 in *Science in the Modern World Polity: Institutionalization and Globalization*, edited by G. Drori, J. W. Meyer, F. O. Ramirez, and E. Schofer. Stanford, CA: Stanford University Press.
- Singer, J. David and Melvin Small. 1990. *National Material Capabilities Data, 1816-1985* [dataset]. Ann Arbor, MI: Inter-university Consortium for Political and Social Research (ICSPR).
- Taylor, Charles L. and Michael C. Hudson. 1973. *World Handbook of Political and Social Indicators*. 2d ed. New Haven, CT: Yale University Press.
- Tsutsui, Kiyoteru and Christine Min Wotipka. 2004. "Global Civil Society and the International Human Rights Movement: Citizen Participation in Human Rights International Nongovernmental Organizations." *Social Forces* 83:587-620.
- UNESCO. 1963. *The Development of Higher Education in Africa*. Paris, France: United Nations Educational, Scientific and Cultural Organization (UNESCO).
- . 2000. *Statistical Yearbook*. New York: United Nations Publication.
- . 2004. *UNESCO Online Database*. Montreal, Canada: UNESCO Institute for Statistics Online Publication ([www.uis.unesco.org](http://www.uis.unesco.org)).
- Union of International Associations. 1986, 1988, 1995, 2000. *The Yearbook of International Associations*. Munich, Germany: K. G. Saur.
- Wallerstein, Immanuel M. 1974. *The Modern World-System*. New York: Academic.
- Windolf, Paul. 1997. *Expansion and Structural Change: Higher Education in Germany, the United States, and Japan*. Boulder, CO: Westview.
- Wittrock, Bjorn. 1993. "The Modern University: The Three Transformations." Pp. 303-62 in *The European and American University Since 1800: Historical and Sociological Essays*, edited by S. Rothblatt and B. Wittrock. Cambridge, England: Cambridge University Press.
- Wyatt, Ian. 2005. "A Century of Occupational Change." Paper presented at the Federal Forecasters Conference, April 21, Washington, D.C.