

Steven Brint  
JE Mark Riddle  
Lori Turk-Bicakci  
Charles S. Levy

---

## From the Liberal to the Practical Arts in American Colleges and Universities: Organizational Analysis and Curricular Change

One of the most important changes in American higher education over the last 30 years has been the gradual shrinking of the old arts and sciences core of undergraduate education and the expansion of occupational and professional programs. Occupational fields have accounted for approximately 60% of bachelors' degrees in recent years, up from 45% in the 1960s, and hundreds of institutions now award 80% or more of their degrees in these fields (Brint, 2001)

The arts and sciences originated historically for the pursuit of knowledge "for its own sake" and, simultaneously, as the educational foundation for youths preparing to occupy positions of power and influence in society. They include the basic fields of science and scholarship, such as chemistry, economics, history, literature, mathematics, philosophy, and political science. By contrast, programs in occupational fields are designed to educate students for jobs—in business, education, engineering, nursing, public administration, and many others. These applied programs are often housed in their own professional schools or colleges distinct from colleges of arts and sciences. In this paper, we will sometimes refer to these programs collectively as the "practical arts," a term

We would like to thank Philip Altbach, Mazen Hashem, John Mohr, Harriet P. Morgan, Ann Mullen, Craig Rawlings, Ann Swidler, and three anonymous reviewers for comments and/or bibliographic references that helped to improve the quality of this paper.

*Steven Brint is a professor in the Department of Sociology at the University of California, Riverside. Mark Riddle, Lori Turk-Bicakci, and Charles S. Levy are graduate students in the Department of Sociology at the University of California, Riverside.*

*The Journal of Higher Education*, Vol. 76, No. 2 (March/April 2005)  
Copyright © 2005 by The Ohio State University

we consider an apposite contrast to the familiar term “liberal arts.” For the most part, however, we will use the more conventional term “occupational-professional” programs.

This paper is not intended as a critique of occupational-professional education in American colleges and universities. Indeed, many writers, including Jencks and Riesman (1968) and Clark (1983), have argued that a key strength of American higher education has been its receptivity to practical training, beginning well before the original Morrill Act (Geiger, 1998), but of course stimulated greatly by the land grant commitments of the federal government. It is worth noting in this context that most educational systems in the industrialized world are much less focused on the arts and sciences than the American system. The French and Swedish, for example, extend vocational tracks from secondary to higher education. Countries like Germany in which arts and sciences predominate are able to maintain this focus primarily because of the early differentiation of primary and secondary schooling into vocational and academic tracks (Allmendinger, 1986). Nor do most European countries have general education requirements at all in the undergraduate curriculum. The Continental pattern is to channel students directly into specialized study in a discipline.<sup>2</sup>

At the same time, there can be little doubt that the conflict between market-based utilitarianism and the liberal arts tradition of education for understanding and democratic citizenship has been an important touchstone in the American context. Decisive shifts in one direction or the other have often been interpreted as indicators of the state of relations between the great forces of the market and cultural idealism among American elites. Even today, advocates of the arts and sciences frequently argue that the basic disciplines are superior sources of study for broadening the horizons of undergraduates (Geiger, 1980; Shapiro, 1997) and for developing skills in analysis, written and oral communication, and critical thinking (Bowen & Bok, 1998: 209–216). These views are supported by findings of sharp declines in self-reported gains among American college students in the 1990s as compared to college students in the late 1960s in awareness of different philosophies and cultures; in understanding and appreciation of science, literature and the arts; and in personal development when compared to American college students from the late 1960s (Kuh, 1999). A significant portion of these declines can be attributed to lower levels of course taking in arts and sciences fields (Adelman, 1995).

In this paper, we will try to answer two key questions about this rise of the practical arts in American four-year colleges and universities. First, is this shift a historical departure, or is it instead a continuation of the dominant tendency in American higher education in the twentieth

century, a tendency which was interrupted briefly in the 1960s by an unusual conjunction of forces favorable to the arts and sciences? Second, what institutional characteristics are most strongly associated with the production of a large number of degrees in occupational-professional fields as opposed to the arts and sciences?

These questions are important; scholars do not know whether the situation today is anomalous from a historical perspective. If American higher education has been predominantly concerned with occupational education for most of the last century, perhaps concerns about the “endangered” liberal arts are overstated, or at least should be evaluated in this larger context. Scholars also do not have a confident sense of where change since 1970 has been greatest. Are institutions focusing on applied fields central or marginal in the American system of higher education? Are they mainly public or not? Are they spread throughout the system or located mainly in particular regions and market segments? Because answers to these questions allow us to identify the locations in which the arts and sciences are weakest, they have potentially significant implications for higher education policy, particularly for efforts to revive or “reinvent” the arts and sciences in the context of predominantly occupationally oriented curricula (see, e.g., Shulman, 1997), and for efforts to reverse declines in the personal, civic, and cultural development of American college students.

The paper is divided into two major sections, reflecting the two key questions under consideration and the different methodological approaches that we bring to bear on each. We will first address the debate about historical trends in occupational-professional versus arts and sciences degrees. This analysis is based on a historical time series showing how the proportion of graduates in these two areas has changed from the 1910s to today. We will then discuss theories of the social bases of occupational-professional versus liberal arts organization among four-year colleges and universities. These theories focus, respectively, on (1) organizational functions, (2) status and selectivity, (3) historical traditions, and (4) socioeconomic and political contexts. We will present multiple-regression analyses to examine these theories and to locate the centers of occupational-professional and arts and sciences education among American four-year colleges and universities. We will conclude by considering what the findings imply about the future of American higher education.

### *Undergraduate Degree Trends, 1915–2000*

Has the American undergraduate experience been primarily utilitarian in emphasis over the past century or has it been devoted primarily to

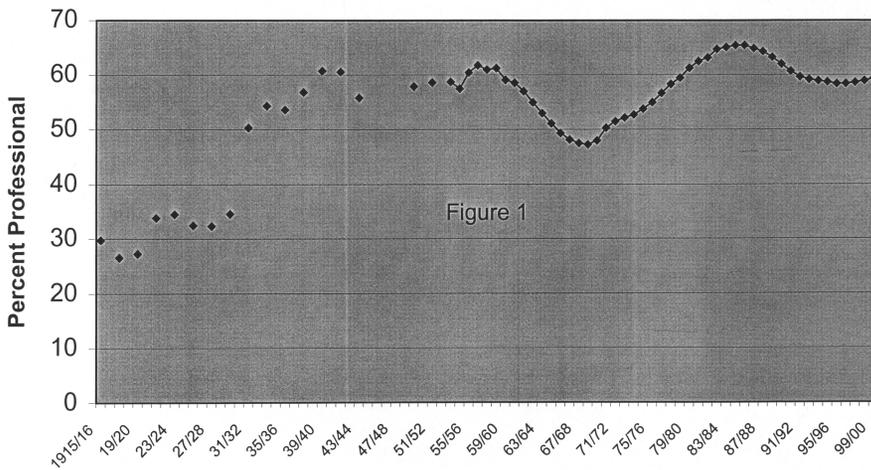
education in the arts and sciences? Oddly, no one, so far as we know, has attempted to answer this question through the development of a historical time series.<sup>3</sup> There are reasons to believe, as many do, that the 1960s and early 1970s represent a historically unusual period favoring the arts and sciences in the context of an otherwise longstanding historical commitment of most students and institutions to occupational majors. The land grant universities, after all, were strongly oriented to occupational-professional education from the beginning, and public institutions have long educated a large proportion of American college students. Yet there are also good reasons to believe that the practical arts have become dominant at the undergraduate level only recently. Before World War II, college going was more completely the preserve of the middle and upper-middle classes. Goyette and Mullen (2002) show that social class is strongly associated with majoring in the arts and sciences today, and it is likely that it was also associated with this preference in the past.

The vagaries of official statistics make it difficult to know with certainty whether the recent shift toward occupational-professional fields represents a long-term continuity in the organization of American higher education or a relatively new departure. Before the mid-1960s, government statistics do not separate first professional degrees from bachelors' degrees. In addition, the fields used for classification in the 1920s and 1930s vary greatly from those used in the 1950s and 1960s, and still more so from those in use today. To develop a time series for the percentage of bachelors' degrees awarded in occupational-professional fields, we have had to make two adjustments to government statistics: first, eliminating first professional degree fields (concentrated in law, medicine, and theology), because they are not truly bachelors'-level degrees, and, second, creating tables of correspondence for degree fields used in earlier years and those used by the National Center for Education Statistics (NCES) today.<sup>4</sup>

The time series also includes a solution to one other major problem in estimation. Before 1930–31, two major categories are used in government statistics: degrees awarded in Arts and Sciences (A&S) and degrees awarded in Professional Schools. Only aggregate degrees are given for A&S, while degrees awarded in professional schools are disaggregated by field. Between 1930–31 and 1943–44, by contrast, degrees in A&S are divided between traditional A&S fields and occupational programs within arts and sciences colleges. We know from this data that A&S degrees before 1930–31 must include significant numbers of degrees that we would today classify as occupational-professional. These include degrees in such fields as agriculture, commerce, engineering, and journalism. (During this period, colleges and universities did not consistently locate their occupational programs in separate professional

schools; some located them within colleges of arts and sciences.) Fortunately, for the period 1915–15 through 1929–30, it is possible to estimate the percentage of occupational-professional degrees within A&S by fitting a polynomial spline through data points associated with occupational degrees bestowed within arts and sciences colleges during the period 1930–31 through 1943–44.<sup>5</sup> Our estimates for these early years in the time series are corrected in this way. An extrapolation of the rate of error across the relatively short length of the estimated section suggests that deviations from the prediction line will be within the range of plus or minus two percentage points.

Because detailed data by subfields is not available before the 1960s, we have allocated fields to the category in which a majority of graduates belong. We do not believe the accuracy of the time series is greatly affected by this allocation rule, because the great majority of fields clearly belong either to the arts and sciences or the occupational-professional category. Even in the few divided fields (notably, communications, legal studies, psychology,



SOURCES: U.S. Department of the Interior (1917), pp. 298, 300; U.S. Department of the Interior (1919), pp. 732, 734; U.S. Department of the Interior (1922), pp. 19, 21; U.S. Department of the Interior (1925), pp. 589, 591; U.S. Department of the Interior (1927), pp. 14, 16; U.S. Department of the Interior (1929), pp. 19–20, 22; U.S. Department of the Interior (1931), pp. 355–57, 360–61; U.S. Department of the Interior (1933), pp. 91–101; U.S. Department of the Interior (1935), pp. 88–97; U.S. Department of the Interior (1937), pp. 78–87; U.S. Department of the Interior (1939), pp. 104–109; U.S. Department of the Interior (1943), pp. 55–56; Federal Security Administration (1945), pp. 62–63; Federal Security Agency (1950); Federal Security Agency (1951); Federal Security Agency (1952); U.S. Department of Health, Education, and Welfare (1953); U.S. Department of Health, Education, and Welfare (1954); U.S. Department of Health, Education, and Welfare (1956), p. 72–74; National Center for Educational Statistics (1958), pp. 18–19; U.S. Department of Health, Education, and Welfare (1960), pp. 83–85; National Center for Educational Statistics (1966), p. 8; National Center for Educational Statistics (1967), pp. 258–64; National Center for Educational Statistics (1968), p. 8; National Center for Educational Statistics (1969), p. 9; National Center for Educational Statistics (1970), p. 8; National Center for Educational Statistics (1971), pp. 8–9; National Center for Educational Statistics (1988), pp. 79–83; National Center for Educational Statistics (2001), p. 295.

FIG 1. Percent Occupational-Professional Degrees, 1915–2000

and visual and performing arts), the great majority of graduates clearly belong either to one category or the other. Communications, for example, is and has been predominantly applied. For most of the period, it was mainly journalism. Similarly, psychology is and has been predominantly arts and sciences. We therefore believe the data presented in Figure 1 to be accurate within 1–2% of the true proportion for each of the years reported.

The time series includes all available years from 1915–16 to 2000–01. For years before 1949–50, data are available biennially through the *Biennial Survey of Education*. For years since 1949–50, data are available annually. Due to wartime exigencies and postwar reorganizations, data on degrees awarded for 1945–46 and 1947–48 were not collected.

Figure 1 shows that the arts and sciences dominated in the 1910s and 1920s, at a time when higher education was a preserve of the middle and upper-middle classes, and the English model of liberal arts education at the collegiate level remained strong. This dominance began to slip just before the Great Depression. By the mid-1930s, occupational-professional programs were significantly stronger. Data from the World War II period are potentially somewhat misleading because of the large numbers of men fighting in the war. However, following World War II and through the 1950s, occupational-professional programs were once again decisively stronger than the arts and sciences, encouraged no doubt at first by the returning G.I.s who were older than traditional students and inclined toward degrees that would give them a leg up on their careers. In the early and mid-1960s, the arts and sciences regained control, with nearly 55% of graduates. In terms of absolute numbers of students and professors, this was a high watermark for many arts and sciences fields. The conjunction of a continuing national commitment to basic science following World War II and Sputnik, combined with promising developments in the arts and humanities, and the sophisticated social criticism found in some social science disciplines created unusually favorable grounds for the advance of the arts and sciences, even at a time of great expansion in enrollments. If we restrict our focus to the post-World War II period, the term “resurgence” is accurate; patterns in degrees awarded after 1971 are reminiscent of the patterns found in the late 1940s and throughout the 1950s.

Thus, a long-term historical view suggests an underlying trend toward occupational-professional programs combined with shorter-term cyclical movements. Within these cyclical movements, periods of change coincide with economic declines (the Great Depression of the 1930s and the tightening of the college labor market at the end of the 1960s). By contrast, periods of prosperity are sometimes (but not always) associated with stronger preferences for the arts and sciences. Economic declines are not, however, the only force involved in the two marked shifts

toward occupational-professional degrees during the period covered by our time series. The development of college-level credential requirements in newly professionalizing occupations is clearly another important factor. For example, the proportion of all bachelors' degrees awarded in education increased by more than 7% between 1915 and 1929, as many normal schools were transformed into teachers' colleges.

*The Resurgence of the Practical Arts, 1970–2000*

The most recent turn toward the practical arts dates from the depressed college labor market of the early 1970s (Freeman, 1976), and it continues to be encouraged by demographic and economic forces: an ever-growing number of students vying for a less rapidly growing number of good careers. In addition, a shift in federal financial aid policy from grants to loans may have encouraged lower-income students to choose curricula linked to jobs that could allow rapid loan repayment (Slaughter, 1998).

In the fifteen years between 1970–71 and 1985–86, occupational-professional fields gained significantly as compared to arts and sciences fields, with nearly two in three degrees awarded in occupational-professional fields in 1985–86. The arts and sciences rebounded from their nadir of the mid-1980s, but a decisive majority of degrees have continued to be awarded in occupational-professional fields since that time; in recent years, some 58% of bachelors' degrees have been awarded in occupational-professional fields. A more refined analysis can be made of these data by allocating subfields within the broad NCES disciplinary categories. Such an analysis suggests that a more accurate figure for the proportion of occupational-professional degrees awarded would be 2–3% higher.<sup>5</sup>

At the undergraduate level, the fastest-growing degree fields include a number that barely existed 30 years ago. Protective services and computer and information systems both experienced more than a ten-fold growth between 1970–71 and 2000–2001; fitness, recreation, and leisure studies experienced more than a five-fold growth; and communications grew more than three times larger. As Table 1 indicates, over the last three decades the fast-growing fields have been occupational in virtually every case.<sup>6</sup> The fastest-growing of all has been business, which now accounts for some one-fifth of all undergraduate degrees—up from one-seventh in 1970–71. As Adelman observed, business became in the 1980s “the empirical core curriculum” (Adelman, 1995, p. 229). By contrast, over the period only four liberal arts fields grew relative to other fields. Two of these fields—psychology and life sciences—are

TABLE I  
Growing, Stable, and Declining Degree Fields, 1970–2000

A. Growing Fields	B. Stable Fields	C. Declining Fields
<b>Bachelor's Degree Fields</b>		
<i>I. Fields with Fewer than 1% of BA/BS Degrees in 2000</i>		
Law/Legal Studies	Architecture	Library Science
Transportation Studies	Area/Ethnic Studies	Philosophy
	Communications	Religious Studies
	Technology	
	Theology	
<i>II. Fields with 1–5% of BA/BS Degrees in 2000</i>		
Public Administration	Agricultural Science	English Literature
Visual/Performing Arts	Home Economics	Physical Sciences
Communications		Mathematics
Liberal/General Studies		Foreign Languages/ Literatures
Interdisciplinary Studies		
Computer/Info. Systems		
Protective Services		
Recreation/Leisure/Fitness		
<i>III. Fields with More than 5% of BA/BS Degrees in 2000</i>		
Business	Engineering	Education
Health Professions		Social Sciences
Psychology		History
Biological/Life Sciences		
<b>Master's Degree Fields</b>		
<i>I. Fields with Fewer than 1% of Master's Degrees in 1995–96</i>		
Communications Tech.	Area/Ethnic Studies	Foreign Languages/ Literature
Engineering Tech.	Home Economics	Philosophy/Religion
Law/Legal Studies		
Liberal Studies		
Interdisciplinary/ Multidisciplinary Studies		
Parks/Recreation/Fitness		
Protective Services		
<i>II. Fields with 1–5% of Master's Degrees in 1995–96</i>		
Communications	Agriculture/Nat. Resources	Biological/Life Sciences
Computer/Information Sciences	Theology	English Literature
Psychology	Visual/Performing Arts	Library Science
	Architecture	Mathematics
		Physical Sciences
		Social Science/History
<i>III. Fields with More than 5% of Master's Degrees in 1995–96</i>		
Business Administration	Engineering	Education
Health Professions		
Public Administration/ Services		

SOURCE: Computed from NCES, 1998, p. 282–3.

closely linked to health occupations. The other two fields are “liberal/general studies” and “interdisciplinary studies.” These latter two fields—still quite small in numbers of graduates—illustrate one facet of another interesting trend in academe: the slow and still very limited erosion of disciplinary boundaries in the liberal arts. Performing and visual arts, fields which could be classified either as arts and sciences or as occupational-professional, have also grown a little relative to other fields.<sup>7</sup>

Every other arts and sciences field has declined not only proportionately, but also in absolute numbers. It is important to emphasize this point, because the American higher education system is substantially larger today than it was in 1970–71. More than 1.5 million students graduated with bachelors’ degrees in 2000–2001 compared to about 840,000 in 1970–71. Under these circumstances, it is not easy for a field to decline in absolute numbers, however poorly it may fare in competition with other fields. In this context, it is necessary to underline the significance of a decline in absolute numbers: *During a period in which graduates nearly doubled, almost every field which constituted the old liberal arts core of the undergraduate college was in absolute decline as measured by numbers of graduates. This includes not only all of the humanities and social sciences (except psychology), but also the physical sciences and mathematics.* One could say that all of the traditional arts and sciences fields, except those closely connected to health careers, have a receding profile in today’s colleges and universities.

From these new enrollment patterns arises the prevailing wisdom: “[In] recent decades, students . . . have been oriented chiefly toward gaining useful skills and knowledge rather than membership in a cultural elite . . .” (Trow, 2000, p. 1), and the familiar but nevertheless arresting statistic from Astin’s annual survey showing that the proportion of college freshmen interested in attending college to develop a “meaningful philosophy of life” dropped by 45% in the years between 1967 and 1987, while the proportion interested in attending to “become well-off financially” grew by 40% over essentially the same period (Astin, 1998).

Institutions, nevertheless, vary greatly in the extent to which they have embraced the “practical arts.” Hundreds of institutions graduate nearly all of their students in occupational-professional fields. Hundreds more maintain a near-exclusive focus on the arts and sciences. And, of course, a very large number of institutions are located somewhere between these two extremes. We will turn now to an analysis of the sources of variation among American colleges and universities in the proportion of bachelor’s degrees they award in occupational-professional as opposed to arts and sciences fields.

*Institutional Bases of the "Practical Arts"*

What factors explain this variation in curricular focus among American colleges and universities? Previous efforts to investigate this issue have focused on one or another of two institutional characteristics: Carnegie classification and average SAT scores (see Breneman, 1994; Gilbert, 1995; Morgan, 1998; and Turner & Bowen, 1990). Are these the most important influences? It is at least plausible that other factors, such as socioeconomic composition, size, religious affiliation, or regional location are also important explanatory factors. Our approach is to develop a set of explanatory models based on competing theoretical expectations about the relationship between institutional characteristics and curricular emphasis and to choose the most important explanatory variables from these models for further analysis. Specifically, we focus on four sets of hypotheses to account for levels of concentration in occupational-professional fields. These have to do with: (1) organizational functions and market segmentation, (2) status and selectivity, (3) historical traditions, and (4) the environmental context in which institutions are located.

The first set of hypotheses is based on the expectation that degree concentrations should be associated with differences in *organizational functions*. This is obviously true in the case of institutions specifically constituted for the purpose of occupational education, such as the Georgia Institute of Technology or the University of Texas Health Sciences campus. The Carnegie classification system was designed to reflect (and also to shape) the functional differentiation of the American higher education system circa 1970. The Carnegie categories distinguish between institutions that serve differing functions as marked by the level of degrees offered and the defined purposes of the institutions. Selective baccalaureate-granting institutions are functionally differentiated in this framework by their greater concentration on arts and sciences fields. In so far as they are oriented to the advance of basic science and scholarship, research universities might also be expected to produce comparatively high proportions of arts and sciences graduates. Campus size, whether measured by enrollment or budget, is another functional measure in so far as size reflects the likelihood that curricular activities will be more diverse than concentrated. Today, program diversification occurs primarily through the development of new occupational-professional programs (Breneman, 1994; Hashem, 2002). Functional analysis can be enhanced by drawing on the insights of market segmentation economics. Winston (1999) has argued that because of their small subsidy resources, the less prestigious baccalaureate and master's granting insti-

tutions face the largest incentives to reduce their cost structures or diversify their current revenue streams. This leads to the expectation that occupational-professional fields may be particularly strong at Carnegie BA II and Carnegie MA I and MA II (or Comprehensive) institutions. Thus, other factors held constant, we expect BA I colleges, Research I universities, and smaller institutions to award a higher proportion of degrees in arts and sciences fields, while technical colleges and universities, larger institutions, and the financially weaker BA II and MA I and II institutions to award a higher proportion of degrees in occupational-professional fields.

The second set of hypotheses is based on the expectation that degree concentrations should be associated with the *status and selectivity* of institutions. Higher education observers have long noted the dominant ideal of elite sectors of American higher education is that “students should do liberal arts work as undergraduates, postponing occupational training until they entered a graduate school or took a . . . job” (Jencks & Riesman, 1968, p. 263). Reputation and undergraduates’ standardized test scores are indicators of academic status and selectivity. The socioeconomic composition of student bodies is a second dimension of status. Students from higher SES families may be expected to enroll in higher status curricula (Bourdieu & Passeron, 1977). The economic status of institutions is a third dimension of status. Institutions charging high tuitions and those with large operating budgets per student are out of reach of many lower and middle-class students. These institutions might also be associated with higher status curricula in the arts and sciences. Thus, we expect academically selective, socially elite, and expensive institutions to have higher proportions of graduates in the arts and sciences.

The third set of hypotheses is based on the expectation that *historical traditions* should make a difference in the proportion of occupational degrees awarded. Organizational sociologists since Stinchcombe (1965) have noted the constraining force of the institutional designs at the time of their foundings. Colleges founded earlier in the nation’s history, denominational colleges connected originally to the liberal arts, and women’s and historically black institutions might all be expected to cleave closely to the older traditions in undergraduate education, while state institutions, influenced throughout their history by the economic development concerns spelled out in the Morrill Acts, should be more likely to favor practical education as a means of serving their states and their generally less affluent student constituencies. Catholic colleges were founded to provide opportunities to members of then-subordinate religious and ethnic communities, and it is reasonable to expect that they

might remain more attuned to occupational-professional education. Thus, we expect older, Protestant-affiliated, single-sex, historically black, and private institutions to retain a stronger focus on the arts and sciences.

The fourth set of hypotheses is based on the expectation that degree concentrations should be associated with the *socioeconomic and political context* in which institutions act. Institutional offerings may reflect more liberal or more conservative political cultures of states. States with more liberal political cultures may encourage a stronger emphasis on the arts and sciences because of citizen concerns with issues of intellectual and social development, whereas more conservative states may feel an affinity to the utilitarian outlooks of occupational-professional programs. Degree concentrations might also reflect variations in opportunities for postgraduate training within states. Where such opportunities are relatively plentiful, undergraduates can “afford” to major in arts and sciences fields, knowing that they can receive occupational education following college graduation. We might expect a correlation between economic growth and arts and sciences for similar reasons. Where average incomes are growing, more people will feel a degree of autonomy from the conditioning influence of market forces (Brint & Karabel, 1991). Even population growth alone might encourage a greater emphasis on traditionally higher status curricula, because population growth creates a sense of increasing opportunities. Thus, we expect variations in the proportion of arts and sciences graduates to reflect the area of the country in which institutions are located and changes in states’ per capita incomes and population growth rates.

### *Data and Methods*

The data used to construct the dependent variable in this analysis is drawn from the NCES annual survey of American colleges and universities, as reported in its Integrated Post-secondary Educational Survey (IPEDS). We have used data from 1997–98, the most recent data currently available on degree fields by institution. We have classified fields as either occupational-professional or arts and sciences and computed the proportion occupational-professional degrees awarded at each institution for 1997–98. All data is for bachelor’s degrees only. Table 2 shows the categorization scheme used in this analysis. This categorization scheme is based on the 40 major discipline categories currently in use by NCES. To increase the accuracy of the analysis, we reallocated a small number of subfields in communications, law and legal studies,

TABLE 2

## Occupational/Professional and Arts and Sciences Degree Categories

Occupational/Professional	Arts and Sciences
Advertising (Communications)	Area, ethnic and cultural studies
Agricultural business & production	Biological sciences/Life sciences
Agricultural sciences	Communications (except those found under occ./prof.)
Architecture and related programs	English language and literature/letters
Arts management (Visual & Perform. Arts)	Foreign languages and literatures
Broadcast journalism (Communications)	History
Business management & admin. services	Law and legal studies (except those found under occ./prof.)
Clinical psychology (Psychology)	Liberal/general studies & humanities
Communications Technologies (Communications)	Mathematics
Communications, other (Communications)	Multi/Interdisciplinary Studies
Computer & information sciences	Philosophy and religion
Commercial photography (Visual & Perform. Arts)	Physical Sciences
Communications, General	Psychology (except those found under occ./prof.)
Conservation & renew. natural resources	Social Sciences
Construction trades	Visual & performing arts (except those found under occ./prof.)
Counseling psychology (Psychology)	
Education	
Engineering	
Engineering related technologies	
Fashion design (Visual & Perform. Arts)	
Film-video making/cinematography and prod. (Visual & Perform. Arts)	
Graphic design, commercial art and illus. (Visual & Perform. Arts)	
Health professions and related sciences	
Home economics	
Industrial design (Visual & Perform. Arts)	
Interior design (Visual & Perform. Arts)	
Journalism (Communications)	
Law (Law and legal studies)	
Library science	
Marketing ops./market & distribution	
Mechanics and repairers	
Military technologies	
Music bus. management & merchandising (Visual & Perform. Arts)	
Paralegal/legal asst. (Law and legal studies)	
Parks, recreation, leisure & fitness	
Personal & Miscellaneous services	
Precision production trades	
Protective services	
Public administration and services	
Public relations & Organizational comm. (Communications)	
Radio & television broadcasting (Communications)	
School psychology (Psychology)	
Science technologies	
Theological studies/religious vocations	
Transportation & material moving workers	
Vocational home economics	

psychology, and visual and performing arts. (See Table 2.) The dependent variable is continuous and runs from under 10% to over 90% of degrees awarded in occupational-professional programs.

The data set used in this analysis was constructed by combining the earned degrees data with variables collected from a wide variety of sources and archived in the Institutional Data Archive on American Higher Education (IDA). The analysis is based on data collected on every four-year college and university in the United States listed in the Higher Education Directory (1999). We will use sample statistics in reporting the results of our analyses, however, because not all institutions are included in the Higher Education Directory and because missing data do not allow us to make claims that the analyses are based on a complete representation of the underlying population.<sup>8</sup>

Table 3 provides an overview of the independent variables used in the analysis. The independent variables are grouped in relation to the four sets of hypotheses described above. Our analyses compare the explanatory power of these sets of independent variables. Variables in Model 1 (organizational function/market segment) include: (1) dummy-coded variables for each Carnegie classifications measured in 1994 with BA I institutions as the reference category; (2) student enrollment in 1997–98; and (3) log of operating budget in 1997–98, the latter two being measures of organizational size. This set also includes: (4) a variable dummy coded to isolate institutions dedicated to technical, business, or health sciences education.<sup>9</sup> Variables in Model 2 (status and selectivity) include: (1) average combined SAT/ACT scores; (2) a dummy variable for institutions of national reputation based on membership in the American Association of Universities, the Consortium for Financing Higher Education, and other measures of national reputation; (3) dummy variables for five categories of graduation rates—a measure correlated with the socioeconomic composition of student bodies; and (4) log of tuition. The first two of these variables are academic status variables, and the last measures economic status of institutions. In the absence of direct measures of the socioeconomic composition of student bodies, we have chosen to use five-year graduation rates, a measure correlated both with the academic status of institutions and the socioeconomic status of student bodies. Variables in Model 3 (historical traditions) include: (1) institutional age in 2002 coded in seven time periods with colleges established in the seventeenth and eighteenth centuries as the reference category; (2) a dummy variable for public institutions; (3) dummy variables for evangelical Christian, other Protestant, and Catholic colleges with independent, nonreligious colleges as the refer-

TABLE 3  
Independent Variables

Variable	Categories/Range	Level of Measurement
<b>I. Function/Market Segment</b>		
Technical Institution	Technical Other (reference)	Nominal
Carnegie Classification	BA II BA I (Reference) MA II MA I Doctorate II Doctorate I Research II Research I	Nominal
Enrollment	278–48,906	Interval
Log operating Budget	\$3.1M–\$3.03B	Interval
<b>II. Status/Selectivity</b>		
Combined (V+M) SAT/ACT Scores	623–1500 (SAT) ACT converted to SAT scale	Interval
“National” Institution	National Other (Reference)	Nominal
5-Year Graduation Rate	Very High: >75% (Reference) High: 60–74% public; 65–74% private Mid: 35–59% public; 40–64% private Low: < 35% public; < 40% private V. Low: < 15% & > 25% part-time	Nominal
Log Tuition	\$150–\$32,164	Interval
<b>III. Historical Tradition</b>		
Date of Establishment	Before 1800 (reference) 1800–1850 1851–1875 1876–1900 1901–1925 1926–1950 1951–2000	Nominal
Control	Public Private (reference)	Nominal
Religious Affiliation <sup>1</sup>	No Religious Affiliation (reference) Christian Council Colleges Other Protestant Catholic	Nominal
Historically Black	Yes No (reference)	Nominal
Women’s College	Yes No (reference)	Nominal

TABLE 3 (Continued)

Variable	Categories/Range	Level of Measurement
IV. Social/Political Context		
Region <sup>2</sup>	Northeast (reference) West Coast Mid-Atlantic South Central Southeast Southwest Industrial Midwest Farm Midwest Mountain	Nominal
Population Growth, 1990–2000	–34,841–4,111,627	Interval
Income Growth Per Capita, 1990–2000	\$1,166–\$5,281	Interval

SOURCES: *Carnegie Classification, Enrollment, Control, Religious Affiliation, Historically Black Colleges and Universities, Women's Colleges, Region*: Higher Education Directory (1999); *Technical Institution*: Derived from Higher Education Directory (1999); *Operating Budget, Operating Budget for Student*: National Center for Educational Statistics, IPEDS data file (1999); *SAT/ACT scores*: Higher Education Research Institute (1999); *National Institutions*: American Association of Universities membership list, Consortium for Financing Higher Education membership list, Breneman (1994), Goldberger, Maher, and Flattau (1995), Geiger (2002); *Five Year Graduation Rates*: College Board Institutional data file (1998); *Christian Council Colleges*: CCCU website ([www.cccu.org](http://www.cccu.org)); *Population Growth, 1990–2000, Income Growth Per Capita, 1990–2000*: United States Bureau of the Census data file (2002).

NOTES: <sup>1</sup>The Higher Education Directory data file was our primary source for determining religious affiliations. We also relied on the membership lists provided on websites for denominational colleges. These included: Christian Council ([www.cccu.org](http://www.cccu.org)), Congregationalist ([www.naucc.org](http://www.naucc.org)), Episcopal ([www.cuac.org](http://www.cuac.org)), Independent Baptist ([www.bn66.com/churches/schools](http://www.bn66.com/churches/schools)), Latter Day Saints (Mormon) ([www.lds.org](http://www.lds.org)), Lutheran ([www.lutherancolleges.org](http://www.lutherancolleges.org)), Mennonite ([www.mennoyouth.org](http://www.mennoyouth.org)), Methodist ([www.gbhem.org](http://www.gbhem.org)), Nazarene ([www.ptloma.edu/universityinformation/Nazarene\\_colleges](http://www.ptloma.edu/universityinformation/Nazarene_colleges)), Presbyterian ([www.apcu.net](http://www.apcu.net)), Quaker ([www.earlham.edu/~fahe](http://www.earlham.edu/~fahe)), Roman Catholic ([www.accunet.org](http://www.accunet.org)), Seventh Day Adventist ([www.sdanet.org](http://www.sdanet.org)), and Southern Baptist ([www.baptistschools.org](http://www.baptistschools.org)).

<sup>2</sup>Northeast region includes: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont. Mid-Atlantic region includes: Delaware, Maryland, New Jersey, New York, Pennsylvania, Washington, DC. South Central region includes: Kentucky, North Carolina, Tennessee, Virginia, West Virginia. Southeast region includes: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, South Carolina. Industrial Midwest region includes: Indiana, Illinois, Michigan, Minnesota, Ohio, Wisconsin. Farm Midwest includes: Iowa, Kansas, Nebraska, Missouri, North Dakota, South Dakota. Southwest region includes: Arizona, Colorado, New Mexico, Oklahoma, Texas. Mountain states include: Alaska, Idaho, Montana, Nevada, Utah, Wyoming. West Coast includes: California, Hawaii, Oregon, Washington.

ence category; (4) a dummy variable for historically black colleges and universities; and (5) a dummy variable for women's colleges. Variables in Model 4 include: (1) dummy variables for nine regions of the country with New England as the reference category; (2) income growth per capita by state, 1990–2000; and (3) population growth by state, 1990–2000.<sup>10</sup>

### Findings

We have used ordinary least squares multiple regression to determine the net effects of variables in each of our four models.<sup>11</sup> The regressions

TABLE 4

Four Models of Percent Occupational-Professional Degrees, 1997-98

Variables	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>		<i>Model 4</i>	
	Functional/Market Segment		Status & Selectivity		Historical Traditions		Socio-Political Contexts	
	B	Beta	B	Beta	B	Beta	B	Beta
BA 2	33.9	.702***						
MA 1	35.1	.728***						
MA 2	36.7	.397***						
D 1	32.8	.268***						
D 2	36.2	.325***						
R 1	19.5	.218***						
R 2	30.5	.224***						
Technical Institution	25.5	.158***						
Enrollment (in 0000s)	.6	.206***						
Log_Op Budget	-3.7	-.210***						
Ave. SAVACT (in 000s)			-5.8	-.309***				
National Reputation			-14.2	-.188***				
Very Low Grad Rate			5.5	.106***				
Low Grad Rate		-	-.7	-.007				
Mid Grad Rate			3.2	.065*				
High Grad Rate			-.8	-.011				
Log Tuition			-3.0	-.112***				

\*\*\*p&lt;.001 \*\*p&lt;.01 \*p&lt;.05

Established 1800-1850	14.5	.217***
Established 1851-1875	25.2	.448***
Established 1876-1900	29.5	.549***
Established 1901-1925	28.4	.462***

TABLE 4 (Continued)

Four Models of Percent Occupational-Professional Degrees, 1997-98

Variables	Model 1 Functional/Market Segment		Model 2 Status & Selectivity		Model 3 Historical Traditions		Model 4 Socio-Political Contexts	
	B	Beta	B	Beta	B	Beta	B	Beta
Established 1926–1950					27.3	.376***		
Established 1951–2000					26.5	.407***		
Public Institution					8.6	.182***		
Historically Black Institution					1.4	.015		
Women's College					-12.5	-.111***		
Christian Council College					8.2	.093***		
Other Protestant College					2.5	.047		
Catholic College/University					9.0	.138***		
Population Growth, 1990–2000 (in 000,000s)							-1.7	-.087*
Per Capita Inc Growth, 1990–2000 (in \$0000s)							-2.3	-.084**
West Coast Region							2.1	.026
Mid Atlantic Region							6.4	.111*
South Central Region							8.8	.128***
Industrial Midwest Region							13.5	.230***
Southwest Region							15.3	.191***
Southeast Region							15.8	.239***
Farm Midwest Region							18.8	.238***
Mountain States Region							21.7	.135***
<i>R</i> <sup>2</sup>		.348		.301		.137		.074
<i>Adj. R</i> <sup>2</sup>		.343		.297		.129		.068
<i>SEE</i>		18.3		18.6		21.1		21.8

in Table 4 look successively at the models based on organizational function, status and selectivity, historical traditions, and socioeconomic and political context.

This analysis indicates that an explanatory model built around functional variables explains nearly one-third of the variation in the proportion of occupational-professional degrees awarded by institutions in 1997–98. Not surprisingly, BA I institutions stand out for their commitment to the arts and sciences. Research I universities also award comparatively more arts and sciences degrees than other institutions. By contrast, nonselective baccalaureate institutions (BA II) and comprehensive institutions (MA I and MA II) are strongly associated with higher levels of occupational-professional degrees. These findings tend to confirm Winston's (1999) thesis that the weaker baccalaureate and master's granting institutions should be more market sensitive and, therefore, more occupationally oriented than other institutions. At the same time, institutions in all categories other than elite liberal arts colleges and research universities appear to be highly market sensitive and oriented to occupational-professional education. As expected, larger institutions as measured by student enrollment were also more occupationally oriented. However, our other measure of size, log operating budget, was connected with higher proportions of arts and sciences degrees and thus behaved more like a status variable than a functional variable.

The set of status and selectivity variables also provided a relatively good explanatory model, again explaining nearly one-third of the variation in proportion occupational degrees awarded. The variable measuring average SAT/ACT scores was by some measure the best predictor in this set, with each additional one-hundred points in SAT score being associated with a decrease of nearly 6% in the proportion of occupational as compared to arts and sciences degrees awarded. The national reputation variable also showed strong effects; it was associated with a decrease of 14% in the proportion of occupational degrees awarded. As expected, log tuition was also associated with lower proportions of occupational degrees. The variable measuring six-year graduation rates showed a less consistent predictive power.<sup>12</sup> In general, the findings indicate that the arts and sciences are strongly favored by prestigious institutions and that status includes at least two dimensions, academic and economic.

The models based on historical traditions and sociopolitical contexts were less powerful, although variables in these models (with the exception of historically black colleges and universities) do show the expected pattern of relationships: that is, higher proportions of arts and sciences degrees among older colleges and universities, women's colleges, and more liberal regions of the country (New England, the West Coast, and

the Mid-Atlantic regions). They also show higher proportions of occupational degrees among public, Catholic, and evangelical colleges and in the “heartland” regions of the country (notably, the farm and industrial Midwest, the mountain states, and the Southeast). We have associated population and income growth with higher degrees of autonomy from the conditioning of the labor market. Consistent with this notion, these variables showed significant, albeit weak, net associations with higher proportions of arts and sciences degrees.

Regional variation in the proportion of occupational-professional degrees may be due to a number of possible influences. These include: more conservative political cultures, leading to an emphasis on practical pursuits; economies requiring fewer highly educated professionals; or simply fewer opportunities for postgraduate study. We were unable to find measures that perfectly capture these potential sources of variation, but our exploratory analysis using state data suggests that political culture—as measured by presidential vote in 2000—may be a surprisingly important influence.<sup>13</sup>

Our best-fitting model incorporates variables from each of the four models discussed above. We created this best-fitting model through stepwise deletion of nonsignificant predictors. Table 5 shows the coefficients and significance levels for the independent variables in our best-fitting model.<sup>14</sup>

The results for this model represent a clear improvement over the results obtained for any one of the four models in Table 4. The model explains nearly 60% of the variance in the percentage of occupational degrees awarded by four-year colleges and universities in 1997–98. Standardized regression coefficients indicate that Carnegie categories and average SAT/ACT scores are the strongest predictors of the proportion occupational-professional degrees awarded. These findings indicate that selective baccalaureate-granting institutions and other institutions with strong academic profiles, as measured by average SAT/ACT scores, are the core of support for the arts and sciences, while nonselective baccalaureate-granting institutions, master’s granting institutions, and other institutions with weaker academic profiles are the core of support for occupational-professional education. Other variables also made an important net contribution to the explanatory power of the model. The most important of those associated with higher proportions of occupational-professional degrees were technical institutions, institutions established during the peak years of industrialization (1876–1900), larger institutions, and institutions located in heartland regions. The most important of those associated with higher proportions of arts and sciences degrees were public institutions, historically black institutions, women’s colleges, and institutions located in the Northeast, Atlantic and Western seaboard states.

TABLE 5  
Best-Fitting Model of Percent Occupational-Professional Degrees, 1997–98

<i>A. Functional/Market Variables</i>	<i>B</i>	<i>Beta</i>	<i>D. Socio-Political Context Variables</i>	<i>B</i>	<i>Beta</i>
BA 2	24.3	.501***	Population Growth, 1990–2000 (in 000,000s)	–.2	–.079***
MA 1	27.4	.574***	Per Cap Inc Growth, 1990–2000 (in \$0000s)	–2.0	–.077***
MA 2	27.8	.313***	West Coast Region	–7.2	–.091***
D 1	28.2	.238***	Industrial Midwest Region	6.4	.112***
D 2	30.4	.274***	Southeast Region	6.1	.090***
R 1	25.8	.300***	Farm Midwest Region	7.6	.102***
R 2	29.8	.234***			
Technical Institution Enrollment (in 0000s)	30.0	.195***			
	.3	.109**	<i>R</i> 2	.585	
			<i>Adj. R</i> 2	.575	
			<i>SEE</i>	14.5	
<i>B. Status &amp; Selectivity Variables</i>			*** <i>p</i> <.001   ** <i>p</i> <.01   * <i>p</i> <.05		
Ave. SAT/ACT (in 000s)	–5.1	–.272***			
National Reputation	–6.7	–.089***			
Very Low Grad Rate	3.6	.068**			
Mid-Level Grad Rate	2.4	.048*			
Log Tuition	–2.9	–.107*			
<i>C. Historical Identity Variables</i>					
Established 1851–1875	4.5	.081***			
Established 1876–1900	6.2	.117***			
Public Institution	–8.0	–.172***			
Historically Black	–15.6	–.113***			
Women’s College	–9.5	–.086***			
Evang. Christian College	3.3	.041*			

Perhaps the most interesting finding is the net association between the arts and sciences and institutions created to serve socially disadvantaged groups (women’s colleges, historically black colleges and universities, and public universities). It is particularly notable that state control is associated with a higher proportion of arts and sciences degrees net of other predictors—a finding at odds with popular images of state and land grant institutions. Although high proportions of arts and sciences graduates are the norm only among institutions serving academic and socioeconomic elites, some institutions designed to serve less advantaged groups do provide support for the arts and sciences. This is true of historically black institutions, women’s colleges, and state colleges and universities, but not of religiously affiliated institutions. Evangelical Christian colleges are more likely to embrace occupational-professional fields than are otherwise comparable nondenominational institutions.

*Discussion*

The shift toward the practical arts in American colleges and universities cuts to the core of the competing values of educators in different sectors of the American higher education system. Many educators in the liberal arts sector endorse the view that shaping “the intellectual maturation of young people and widening their cultural horizons has traditionally been the strength and the mission of American undergraduate education” and agree with the assessment that the decline of the liberal arts tradition can only lead to a significant deterioration in “the vitality of intellectual life throughout the broad middle of the academic hierarchy” (Geiger, 1980, p. 54). Against this view, many educators in other sectors argue that colleges and universities have little choice but to adapt to the job-related interests of today’s students, and in any event this adaptation allows higher education to contribute more effectively than it once did to the economic life of the country (see, e.g., Clark, 1998).

Whatever one concludes about the larger value issues at stake, there can be no doubt that the resurgence of the practical arts since 1970 has had important implications for the organization of academe. The growth of occupational-professional education is itself one support for the climate of utilitarianism on campus. It has also led to the migration of faculty toward the professional schools and indeed whole disciplines toward a professional model. In many institutions, arts and sciences disciplines have been transferred to colleges of professional studies to articulate more closely with career-oriented programs.<sup>15</sup> Psychology has become a clinical specialty at some universities and economics an arm of business administration. The smaller arts and sciences disciplines, particularly area studies and foreign languages and literatures, have faced significant downsizing and even elimination, while interdisciplinary majors in the arts and sciences have grown more popular among administrators, sometimes as much for economic as for intellectual reasons (Brint, 2002).

Kerr argued that “it may become increasingly difficult and misleading to talk about the future of ‘higher education.’ There will be many quite different segments, each with its own future . . . Institutions in the different segments will not know or care much about each other” (Kerr, 2002, p. 10). In contrast to contemporary forms of segmentation, Kerr foresaw a new classification of institutions emerging, which include today’s research universities and liberal arts colleges, but also new categories of “professional school institutions” (presumably today’s doctoral-granting institutions) and “polytechnic colleges” (today’s comprehensive and less selective baccalaureate-granting colleges).

Our analysis indicates the plausibility of Kerr's vision of the future. The resurgence of the practical arts since 1970 has been largely driven by less prestigious institutions, which have also experienced the greatest growth in enrollments. The less selective baccalaureate and comprehensive institutions are now quite far along in the direction of transforming themselves into exclusively career-oriented polytechnics.<sup>16</sup> Prestigious institutions, by contrast, do not need to worry about competing for students and funds by providing job-related education, because they have a secure market position. They have, therefore, largely eschewed lower-level practical training and have instead competed for the highest status students and for research grants in the established disciplines. Indeed, some research universities have had an incentive to become markedly *more* liberal arts oriented, as they attempt to compete more exclusively in the "status goods" segment of the market for undergraduate students. Thus, Kerr's vision of the future may need to be adjusted just a little to separate out "liberal arts research universities," such as Duke and Harvard, from true "multiversities," such as the University of Florida and the University of Illinois, in which enrollments in occupational-professional have long been very strong among undergraduates (Morgan, 1998).

Because the current proportion of occupational-professional degrees is comparable to that found throughout much of the mid-twentieth century, it is possible to conclude that worries about the decline of the arts and sciences are overstated. If not for one important difference between the two eras, we would tend to agree with this assessment. That difference is as follows: Where arts and sciences degrees were once concentrated in both BA I and BA II institutions, they are now concentrated in elite segments of the system: the BA I institutions and a fraction of high-status R I institutions (Gilbert, 1995; Morgan, 1998). This suggests that what was once largely a functional divide—different kinds of institutions emphasize different curricula—has become largely a status divide. Kuh's (1999) concerns about changes in students' reports concerning their personal development and cultural awareness should be interpreted in the context of increasing stratification between undergraduates attending elite institutions and all others.

The most important finding of this paper is the connection between less prestigious institutions and high proportions of occupational-professional degrees. We find a particularly strong occupational emphasis in institutions enrolling high proportions of students with low test scores and, by implication, from lower socioeconomic backgrounds.<sup>17</sup> To the extent that these institutions represent the growth areas of academe, the practical arts are greatly favored. The broader institutional implications of this finding are also important: Just as secondary schools became

vocationalized in the early twentieth century, when they were transformed from elite preparatory institutions into institutions the majority attended and did not go beyond (Trow, 1961), so colleges and universities became definitively oriented to occupational-professional education at the end of the twentieth century, at a time when they were becoming mass terminal institutions in the same sense.

A variety of circumstances can, as we have shown, provide freedom from the conditioning influence of the labor market, thereby encouraging higher enrollments in the arts and sciences. Clearly, institutions enrolling students with unusually good prospects in life are much more likely to emphasize the arts and sciences. For this reason, the stratum of selective liberal arts colleges and elite research universities, those that send large numbers of students on to postgraduate studies, will likely continue to be an exception. As environmental influences at the state level, growth in population and per capita income are associated with higher arts and sciences proportions for similar reasons, we believe, because they encourage a degree of freedom from the conditioning influence of the labor market.

However, these forces are not likely to reverse the rise of the practical arts, now that occupational fields have demonstrated their centrality over the last 30 years in both good economic times and bad. It is particularly notable that the growing earnings advantage of college-educated workers in the 1990s did not lead to a marked decline in occupational-professional degrees. This suggests that any rebirth of the arts and sciences as the center of undergraduate education probably lies well in the future, at a time when the bachelor's degree has become a preparatory degree for a majority of students who are planning to pursue postgraduate training, rather than the mass terminal degree it is today.<sup>18</sup> And even in this distant future it is possible that the arts and sciences will become the preserve of a still smaller number of students and faculty than they are today, if they are further devalued by a society that has turned away from the types of intellectualism they reflect and sustain.<sup>19</sup>

### *Notes*

<sup>1</sup>The pattern in Scotland and England is a bit different, and some other parts of the world, including India and Japan, have a variant of general education at the undergraduate level. Interestingly, a recent report of the World Bank's task force on higher education and society makes a case for introducing general education (Hopper, 2001).

<sup>2</sup>The time series developed by Gilbert (1995) goes back only to 1956 and that developed by Turner and Bowen (1990) also begins in the 1950s.

<sup>3</sup>The following fields were classified as "first professional degree" fields throughout the time series and excluded: dentistry, law, medicine, optometry, pharmacy, and veterinary medicine. The following fields were classified as arts and sciences: area studies, biological/life sciences (e.g., biology, biochemistry, ecology, microbiology), English

and cultural studies, ethnic studies, foreign languages and literatures, history, legal studies (other than law as a first professional degree), liberal/general studies, mathematics, multi-/ interdisciplinary studies, philosophy, physical sciences (e.g., chemistry, geology, physics), psychology, religious studies, social science (e.g., anthropology, economics, political science, sociology), visual and performing arts (e.g., art, dance, drama, music). The following fields were classified as occupational-professional: agriculture, architecture, business/commerce, communications, computer and information sciences, construction trades, education, engineering, forestry, health professions (other than first professional degree fields), home economics, industrial technology, journalism, library science, parks and recreation, precision productive trades, pre-dentistry, pre-law, pre-medicine, protective services, public administration, religious vocations (other than theology), and transportation.

<sup>4</sup>This is an algebraic solution. We begin by plotting on a Cartesian coordinate system the proportion of occupational-professional to total degrees in arts and sciences for those years when official data makes that distinction. We then use the line formed by that plot to estimate the proportion occupational-professional for the earlier years in which some occupational-professional programs are contained within arts and science colleges. The line is a curve formed by a fourth-degree polynomial of the form:  $y=3Dax+bx^2+cx^3-dx^4$ . For this reason, the line is frequently referred to as a polynomial spline.

<sup>5</sup>This more refined analysis allocates occupational-professional subfields within arts and sciences categories to the occupational-professional category and vice versa. Thus, mass communication degrees are reallocated from occupational-professional to arts and sciences, while arts management degrees are reallocated from arts and sciences to occupational-professional. Similarly, clinical psychology degrees are reallocated from arts and sciences to occupational-professional.

<sup>6</sup>Hashem (2002) has examined the development of eight fast-growing occupational fields, including computer and information science, legal studies, recreation and fitness, criminal justice, communications, public administration, mental health, and health administration. Two of these fields (computer and information science and legal studies) were offshoots of well-established academic disciplines (mathematics and law) and here innovation occurred near the center of the system. One might expect that innovation in the other fields would have occurred in the weakest schools, those most exposed to market threat. But the innovating institutions were not, by and large, those most exposed to market threat. Instead, they were large, often urban, and less selective universities, such as New York University, Syracuse, Florida State, Wayne State, Kent State University, and San Jose State. In other words, innovation was led by institutions with discretionary resources at the fringes of the center. In two cases (mental health and criminal justice), another organization, the federal government, played a major role by providing funds for the development of new programs. This study illustrates the importance of looking at curricular change in organizational terms and not simply as a function of market forces.

<sup>7</sup>Over the period, economics also grew slightly in absolute terms, perhaps due to its close connection to business, but it did not grow in relative terms.

<sup>8</sup>Data is quite complete on the great majority of variables used in this analysis. No missing values exist for Carnegie classes, enrollment, national reputation, establishment date, public/private control, historically black colleges and universities, women's colleges, region, population growth, or average income growth. Several variables include 10 or fewer missing values: operating budget, operating budget per student, tuition, and graduation rate. Only two variables have larger numbers of missing values: average SAT/ACT scores (148) and religious affiliation (244).

<sup>9</sup>These institutions are usually not exclusively occupational-professional. Both MIT and Cal Tech, for example, also offer degrees in arts and especially sciences.

<sup>10</sup>Enrollment size and log of operating budget are strongly associated ( $r=.82$ ). This raises concerns about multicollinearity. However, a high correlation between two variables in a multiple regression model does not violate the Gauss-Markov assumption concerning the limits of multicollinearity for multiple regression (Berry, 1993). Otherwise,

the correlation matrix indicates moderate to low correlations for the independent variables, and we therefore conclude that the models are not compromised by problems of multicollinearity. Normal diagnostics were run to test for potential biases due to nonnormal distributions, skewness, and outliers. These diagnostic tests indicate that results of the analyses are unbiased.

<sup>11</sup>Using a proportion for a dependent variable in ordinary least squares multiple regression can raise problems if the variable is nonnormally distributed and skewed. In this case, two solutions are possible: either the variable must be transformed or a different statistical model (such as logistic regression or general linear modeling) must be used. However, if the proportion is normally distributed and is mainly dispersed between .3 and .7, as is true of the dependent variable in our analyses, ordinary least-squares multiple regression remains a robust model.

<sup>12</sup>Interestingly, institutions with both very low and mid-level retention rates were associated with higher proportions of occupational degrees, controlling for other variables in the model. Many institutions with very low graduation rates resemble community colleges and proprietary schools in their student base and objectives, while a number of institutions with mid-level graduation rates have adopted either a polytechnic model of post-secondary education or are former teacher's colleges which retain large education programs.

<sup>13</sup>In our exploratory analysis, we used the percentage of each state's vote for George W. Bush in the presidential election of 2000 as an indicator of more conservative political cultures, and graduate degrees per capita as an indicator of postgraduate opportunities. The findings from this two-variable regression suggest that political culture deserves additional study as a potential influence on curricular emphasis. In this two-variable regression, state percentage vote for Bush was strongly associated with state-level variation in the proportion of occupational degrees awarded, while graduate degrees per capita was insignificant.

<sup>14</sup>Again, normal diagnostics show no important biases in the model presented in Table 5.

<sup>15</sup>Two examples of this phenomenon are the College of Science, Technology, and Health Professions at Western Kentucky University and the College of Business and Economics at California State University-Los Angeles. Although organization based on separate colleges of arts and sciences and professional schools remains the norm, such hybrids are now found at a number of institutions.

<sup>16</sup>Our research does not answer one important question: How much of the change at less prestigious institutions is due to the growth of a new market composed of non-traditional, adult re-entry students? Clearly, these students are among the most likely to want courses and degrees that will help them with their careers. We think it likely that they are a very important source of support for occupational programs at comprehensive and doctorate-granting institutions, but a less important influence at BA II institutions, where 18–24-year-old students continue to predominate. This question merits additional study.

<sup>17</sup>No direct measures of socioeconomic composition exist in this data set. One correlated measure, log tuition, was one of the last variables deleted from the best-fitting model, while another correlated measure, five-year graduation rates, showed relatively small net effects (cf. Goyette and Mullen, 2002). It is likely that more direct measures of socioeconomic composition would show stronger effects.

<sup>18</sup>This forecast is based on the view that demographic movements and the inflationary pressures they encourage play major roles in structuring the higher education system at the most macro level. As the number of students entering college goes up, inflationary pressures encourage more students to differentiate themselves from their peers by pursuing still higher levels of education (Collins, 1979, 2002). Eventually, this pressure can encourage a "ratcheting up" of the normative level of education.

<sup>19</sup>This possibility is suggested by Cohen (1998, p. 450).

References

- Adelman, C. (1995). *The new college course map and transcript files: Changes in course-taking and achievement, 1972–1993*. Washington: Department of Education, Office of Educational Research and Improvement.
- Allmendinger, J. (1989). "Educational systems and labor market outcomes." *European Sociological Review*, 5, 231–250.
- Astin, A. W. (1998). "The changing American college student: Thirty-year trends, 1966–1996." *Review of Higher Education*, 21, 115–135.
- Berry, W. (1993). *Understanding regression assumptions*. Newbury Park, CA: Sage Publications.
- Bourdieu, P., & Passeron, J.-C. (1977). *Reproduction in economy, society, and culture*. Beverly Hills: Sage Publications.
- Bowen, W.G., & Bok, D. (1998). *The shape of the river: Long-term consequences of considering race in college and university admissions*. Princeton: Princeton University Press.
- Breneman, D.W. (1994). *Liberal arts colleges—thriving, surviving, or endangered?* Washington: The Brookings Institution Press.
- Brint, S. (2002). "The rise of the 'practical arts'." In S. Brint (Ed.), *The future of the city of intellect: the changing American university* (pp. 231–259). Stanford: Stanford University Press.
- Brint, S., & Karabel, J. (1991). "Institutional origins and transformations: The case of American community colleges." In P.J. DiMaggio and W.W. Powell (Eds.), *The new institutionalism in organizational studies* (pp. 337–360). Chicago: University of Chicago Press.
- Clark, B.R. (1983). *The higher education system: Academic organization in cross-national perspective*. Berkeley: University of California Press.
- Clark, B.R. (1998). *Creating entrepreneurial universities: organizational pathways to transformation*. London: Pergamon.
- College Board. (1999). *Institutional data, 1997–98*. New York: The College Board. (data file)
- Collins, R. (1979). *The credential society: An historical sociology of education and stratification*. New York: Academic Press.
- Collins, R. (2002). "Credential inflation and the future of universities." In S. Brint, (Ed.), *The future of the city of intellect: The changing American university* (pp. 23–46). Stanford: Stanford University Press.
- Cohen, A.M. (1998). *The shaping of American higher education: Emergence and growth of the contemporary system*. San Francisco: Jossey-Bass.
- Federal Security Administration, Office of Education. (1949). *Biennial survey of education in the United States, 1942–44*. Washington: Government Printing Office.
- Federal Security Administration, Office of Education (1950). *Biennial survey of education in the United States, 1948–49*. Chap. 4 ("Statistics of Higher Education"). Washington: Government Printing Office.
- Federal Security Administration, Office of Education (1951). *Earned degrees conferred by higher education institutions*. Washington: Government Printing Office. Circular 282a.

- Federal Security Administration, Office of Education (1952). *Earned degrees conferred by higher education institutions*. Washington: Government Printing office. Circular 333a.
- Freeman, R. (1976). *The overeducated American*. New York: Academic Press.
- Geiger, R.L. (1980). "The college curriculum and the marketplace." *Change* (November/December), 17–23ff.
- Geiger, R.L. (1998). "The rise and fall of useful knowledge: Higher education for science, agriculture and the mechanic arts, 1850–1875." *History of Higher Education Annual* 18, 47–65.
- Gilbert, J. (1995). A "The liberal arts college—is it really an endangered species?" *Change* (September/October), 37–43.
- Goldberger, M.L., Maher, B.A., & Flatteau, P.E. (Eds.). (1995). *Research-doctorate programs in the United States*. Washington: National Academy Press.
- Goyette, K.A., & Mullen, A.L. (2002). "College for what? The influence of social background on the choice of liberal arts or pre-professional fields of study." Paper presented at the annual meeting of the American Sociological Association.
- Hashem, M. (2002). *Academic knowledge from elite closure to public catering: The rise of new growth fields in American higher education*. Unpublished Ph.D. dissertation, Department of Sociology, University of California, Riverside.
- Higher Education Directory. (1999). *Higher education directory*. Falls Church: Higher Education Publications, Inc. (data file).
- Higher Education Research Institute. (1999). *Selectivity index, 1997–98*. Los Angeles: HERI. (data file).
- Hofstadter, R. (1962). *Anti-intellectualism in American life*. New York: Knopf.
- Hopper, R. (Ed.). (2002). *Constructing knowledge societies: New challenges for tertiary education*. New York: World Bank.
- Jencks, C., & Riesman, D. (1968). *The academic revolution*. New York: Doubleday.
- Kerr, C. (2002). "Shock wave II: An introduction to the twenty-first century." In S. Brint (Ed.), *The future of the city of intellect: The changing American university* (pp. 1–22). Stanford: Stanford University Press.
- Kuh, G. (1999). "How are we doing? Tracking the quality of the undergraduate experience, 1960s to the present." *Review of Higher Education* 22, 99–120.
- Morgan, H.P. 1998. *Moving missions: organizational change in liberal arts colleges*. Unpublished Ph.D. dissertation. University of Chicago, Department of Sociology.
- National Center for Educational Statistics. (1966). *Earned degrees conferred, 1963–64*. Washington: Government Printing Office.
- National Center for Educational Statistics. (1967). *Earned degrees conferred, 1964–65*. Washington: Government Printing Office.
- National Center for Educational Statistics. (1968). *Earned degrees conferred, 1965–66*. Washington: Government Printing Office.
- National Center for Educational Statistics. (1969). *Earned degrees conferred, 1966–67*. Washington: Government Printing Office.
- National Center for Educational Statistics. (1970). *Earned degrees conferred, 1967–68*. Washington: Government Printing Office.
- National Center for Educational Statistics. (1971). *Earned degrees conferred, 1968–69*. Washington: Government Printing Office.

- National Center for Educational Statistics. (1998). *Chartbook of degrees conferred, 1969–70 to 1993–94*. Washington: U.S. Office of Education.
- National Center for Educational Statistics. (1999). *Integrated post-secondary educational survey, 1997–98*. Washington: U.S. Office of Education (data file)
- National Center for Educational Statistics. (2001). *Digest of education statistics, 2000*. Washington: U.S. Office of Education.
- Shapiro, H.T. (1997). "Cognition, character and culture in undergraduate education: Rhetoric and reality." In R.G. Ehrenberg (Ed.), *The American University: National treasure or endangered species?* (pp. 58–97). Ithaca: Cornell University Press.
- Shulman, L.S. (1997). "Professing the liberal arts." In R.Orrill (Ed.), *Education and democracy: Re-Imagining liberal learning in America* (pp. 151–173). New York: The College Board.
- Slaughter, S. (1998). "Federal policy and supply side institutional resource allocation at public research universities." *Review of Higher Education* 21, 209–244.
- Stinchcombe, A. (1965). "Social structure and organizations." In J.G. March (Ed.), *Handbook of Organizations* (pp. 142–193). New York: Rand McNally.
- Trow, M. (1961). "The second transformation of American secondary education." *International Journal of Comparative Sociology* 2, 144–166.
- Trow, M. (2000). "From mass higher education to universal access: The American advantage." *Minerva* 37 (Spring): 1–26.
- Turner, S.E., & Bowen, W.G. (1990). "The flight from the arts and sciences: Trends in degrees conferred." *Science*, 250, 517–521.
- U.S. Bureau of the Census. (2002). *Population statistics of the United States, 2000*. Washington: Bureau of the Census. (data file).
- U.S. Department of Health, Education, and Welfare, Office of Education. (1954). *Earned degrees conferred by higher educational institutions*. Washington: Office of Education. Circular No. 360a.
- U.S. Department of Health, Education, and Welfare, Office of Education. (1955). *Earned degrees conferred by higher educational institutions*. Washington: Office of Education. Circular No. 380a.
- U.S. Department of Health, Education, and Welfare, Office of Education. (1956). *Earned degrees conferred by higher educational institutions, 1953–54*. Washington: Office of Education. Circular No. 418.
- U.S. Department of Health, Education, and Welfare, Office of Education. (1958). *Earned degrees conferred, 1955–56*. Washington: Government Printing Office.
- U.S. Department of Health, Education, and Welfare, Office of Education. (1960). *Biennial survey of education, 1956–58*. Washington: Government Printing Office.
- U.S. Department of the Interior, Commissioner of Education. (1917). *Report 1917*. Chap. 4. (AUniversities, colleges and technological schools, 1915–16"). Washington: Government Printing Office.
- U.S. Department of the Interior, Bureau of Education. (1919). *Bulletin 1919*. Chap. 4. ("Statistics of universities, colleges, and professional schools"). Washington: Government Printing Office.
- U.S. Department of the Interior, Bureau of Education. (1922). *Bulletin 1922*. No. 28 ("Statistics of universities, colleges, and professional schools"). Washington: Government Printing Office.

- U.S. Department of the Interior, Bureau of Education. (1925). *Bulletin 1925*. No. 45 ("Statistics of universities, colleges, and professional schools"). Washington: Government Printing Office.
- U.S. Department of the Interior, Bureau of Education. (1927). *Bulletin 1927*. No. 40. ("Statistics of universities, colleges, and professional schools"). Washington: Government Printing Office.
- U.S. Department of the Interior, Office of Education. (1929). *Bulletin 1929*. No. 38. ("Statistics of universities, colleges, and professional schools"). Washington: Government Printing Office.
- U.S. Department of the Interior, Office of Education. (1931). *Biennial Survey of Education, 1929–30*. Chap. 4. ("Statistics of universities, colleges, and professional schools"). Washington: Government Printing Office.
- U.S. Department of the Interior, Office of Education. (1933). *Biennial Survey of Education, 1930–32*. Chap. 3. ("Statistics of universities, colleges, and professional schools"). Washington: Government Printing Office.
- U.S. Department of the Interior, Office of Education. (1935). *Biennial survey of education, 1935*. Chap. 4. ("Statistics of universities, colleges, and professional schools"). Washington: Government Printing Office.
- U.S. Department of the Interior, Office of Education. (1937). *Biennial survey of education, 1937*. Vol. 2, Chap. 4. ("Statistics of universities, colleges, and professional schools"). Washington: Government Printing Office.
- U.S. Department of the Interior, Office of Education. (1939). *Biennial survey of education, 1936–38*. Chap. 4. ("Higher education"). Washington: Government Printing Office.
- U.S. Department of the Interior, Office of Education. (1943). *Biennial surveys of education, 1939–40 and 1941–42*. Chap. 4. ("Higher education"). Washington: Government Printing Office.
- Winston, G.C. (1999). "Subsidies, hierarchy, and peers: The awkward economics of higher education." *Journal of Economic Perspectives* 13, 13–36.

Copyright of Journal of Higher Education is the property of Ohio State University Press and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.