A Priori and Empirical Approaches to the Classification of Higher Education Institutions: The United States Case

Enfoque a priori y enfoque empírico en la clasificación de las instituciones de educación superior: el caso de Estado Unidos

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Abstract

Higher education classification arose in the United States as a result of the dramatic growth in institutions and students in the 1950s and 1960s, as well as the growing federal role as sponsor of research. This paper discusses two epistemological approaches to classification: a priori and empirical and the strengths and weaknesses of both. The paper also discusses recent developments that suggest the era of higher education classification may be ending in the developed world. The paper concludes with an application of lessons from the U.S. case to current debates over higher education classification in Chile.

Keywords: classification and higher education institutions, a priori and empirical approaches, Carnegie Classification, U.S. News and World Report rankings, Academic Ranking of World Universities

Resumen

La clasificación de la educación superior surgió en Estados Unidos a raíz del crecimiento drástico de las instituciones y del estudiantado en las décadas de los cincuenta y sesenta, así como del creciente papel del Gobierno Federal en el financiamiento de la investigación. En el presente artículo se analizan dos enfoques epistemológicos de la clasificación —el enfoque *a priori* y el enfoque empírico— y sus fortalezas y debilidades. Asimismo, se examinan hechos recientes de los que se desprende que la era de la clasificación de la educación superior podría estar llegando a su fin en los países desarrollados. Se concluye el presente estudio aplicando las lecciones del caso estadounidense a los debates actuales sobre la clasificación de la educación superior en Chile.

Palabras clave: instituciones de clasificación y educación superior, enfoques a priori y empírico, Clasificación Carnegie, rankings U. S. News y World Report, ranking académico de universidades del mundo

Classification is an important organizing principle in social life. When classifications are widely adopted, they create the categories of thought through which people orient their actions. We can see this by imagining the difference it would make if educational studies were classified as a field of art rather than as a field of science. In the first case, we can imagine that description of creative educational practices would be close to the center of educational studies; in the second experimental studies of educational practices are close to the center. Influential classifications of higher education institutions, like any other successful classifications, create legitimated structures and roles for institutions classified at different levels, with accompanying differences in opportunities and rewards. It consequently makes a difference whether higher education institutions are classified by their student populations, their degree programs, their research outputs, their financial circumstances, or other characteristics.

In this paper, I will discuss the rise of higher education classification systems in the United States. I will discuss two approaches to the development of classifications: (a) a priori conceptualizations and (b) classifications based on empirical analyses. A priori conceptualizations are based on informed intuitions about the major divisions within an educational system. Empirical approaches, by contrast, develop classifications inductively from an analysis of data about the relationship of higher education institutions to one another. Examining the literature on classification and higher education classification, in particular, I will evaluate the strengths and weaknesses of both approaches. I will also discuss two recent developments in the classification of higher education institutions (HEIs): (a) the proliferation of classificatory categories and dimensions and (b) the partial eclipse of classification by rankings. These developments are important because they have led to the diminished significance of higher education classification in the United States (as well as in Europe). Taken together, they could consequently spell the end of the era of higher education classification.

In the course of this discussion, I will make four primary analytical points: First, I will argue that only an empirical approach can provide scholars and policy makers with the sociological equivalent of an "x-ray" of the underlying structure of a system. It can do so because it builds from the ground up, rather than imposing a vision that may or may not correspond to underlying relationships. At the same time, I will emphasize that in the social sciences, unlike the medical sciences, such "x-rays" can be influenced by the success of a priori conceptualizations that become influential in a system. Over time, a priori classifications can, if they become widely accepted, create an accurate picture of the underlying reality, as institutions adjust to their classification. For this reason, the choice between a priori and empirical approaches is not as clear as it first seems. Second, I will argue that classification systems that build in expectations for organizational mobility are more realistic than those that seek to impose strong constraints on mobility. My research suggests that institutions wish to move up in the hierarchies that matter to them and classificatory systems are on the right track when they provide incentives for institutions to improve. Turning to recent developments in classification, I observe that classifications have become more and more detailed, without necessarily providing additional help in understanding the structure of higher education. Limitations of the human mind prevent us from apprehending and using classifications that include more than a relatively small number of categories. The apprehension and retrieval of dozens of categories are clearly beyond the reach of most people. For this reason, parsimony is essential to effective classification. Third, I will argue that commercial interests and consumer status concerns threaten to marginalize all classification systems and replace them with rankings. These ranking systems stimulate the competitive instincts of high-status institutions and are of particular interest to the parents of high-achieving students. By contrast, less competitive institutions have little interest either in rankings or traditional forms of classification, both of which show them in a poor light. This suggests the need for classifications that are attuned to values of less competitive institutions and provide incentives for these institutions to achieve policy-relevant goals.

At the end of the paper, I will apply lessons from the U.S. case to current discussions about a proposed new classification of universities in Chile.

A priori classification of higher education institutions in the United States

Before 1960, the higher education sector in the United States was a weakly organized institutional field. Certainly nothing like a national system of classification existed. Instead, we can see a few common identity categories (such as the "land-grant" institutions created by mid-19th century federal law to

provide more open access and training in practical fields); some voluntary associations of higher education institutions (such as the American Association of Universities and the American Association of Junior Colleges); and some organizational status groups represented by common membership in inter-collegiate sports conferences (such as "the Ivy League" of selective private universities in the Northeast and the "Big 10" public universities in the industrial Midwest). Looking back, we can also see many institutions without a place; those that did not fit into any of the categories defined by this mélange. Indeed, many institutions saw themselves as one of a kind and, although the idea of public versus private institutions certainly existed, the organization of public higher education varied dramatically within the 50 American states. Locally-supported, county-supported, and state-supported institutions of a wide variety of types were all part of the mix.

The rapid growth and differentiation of the system is the most important context from which broader and more definitive approaches to classification developed. The number of students attending tertiary institutions in the United States tripled between 1950 and 1970, from three million to nine million enrolled students. These students included many more women, members of under-represented minorities, first-generation students, working students, and older students. It quickly became evident to higher education policy makers that the interests and learning needs of these new students differed from those of most college students of the past (Cross, 1971). We might term the period between World War II and the end of the 1970s, the era of "massification." By the end of this era, the total number of colleges and universities in the United States had grown by more than 50 percent and the size of the faculty had more than doubled (Thelin, 2004). The appearance of more or less unrestrained competition among new and established institutions encouraged a search for order. The higher education scholar Patricia Gumport suggested the role that growth and competition played in the search for the order that classification can provide: "It was during this period that the shape of institutions began to change dramatically… For the first time in American higher education history it was necessary to construct a taxonomy that described the varying range of institutional types" (Gumport, Iannozzi, Shaman, & Zemsky, 1997, p. 13).

The post-war growth in federally-funded research was an important reason why the classification systems that emerged emphasized distinctions between "teaching" and "research" institutions. Spurred by the successes of science during World War II and studies showing the potential contribution of science to economic development, the federal government launched ambitious projects to generate basic science, as well as defense-related, space, energy, and health research. In 1953, shortly after the founding of the National Science Foundation, universities accounted for just over 5 percent of total national R&D. By 1975, they accounted for 10 percent of a much bigger national research effort. During this period, the federal government eclipsed industry as the primary patron of university research–and indeed industry became a relatively minor player (Atkinson & Blanpied, 2008). Following in the wake of this influx of funding, doctoral production increased five-fold from 6000 annually in 1950 to just over 34,000 by 1975 (Gumport et al., 1997). The idea that research universities represented the pinnacle of the American higher education system followed from the huge federal investment in science following World War II (Kerr, 1963, chap. 2).

The development of the 1960 California Master Plan (Liaison Committee, 1960) should be regarded as the most important precursor to the development of classification in U.S. higher education. The Master Plan succeeded in imposing an order on what was fast becoming a chaotic competition among public higher education institutions in the state of California. Many of the "state colleges," whose origins lay in teacher training, had developed aspirations to grow into fully-fledged research universities, offering the doctorate. Similarly, many of the two-year community colleges offering associates degrees contemplated a future in which they would offer the full four years of baccalaureate-level education (Kerr, 2001, pp. 173-174). The Master Plan created the first clearly ordered and differentiated organizational field within public higher education, and it was organized by highest degree offered. The categories created by the California Master Plan remained in play and formed the basis of subsequent developments. They were: (a) two-year community colleges offering associates degrees, (b) four-year "comprehensive" universities offering both baccalaureate and master's degrees, and (c) doctoral-granting research universities offering baccalaureate, masters, and doctoral degrees. A primary objective was to create a meaningful functional order for California HEIs with the priority of research universities solely responsible for awarding the doctorate, established at the top of the system (and reflected as well in state funding priorities). Other institutions were arranged by limits on the highest degrees they were allowed to award.

Clark Kerr, the president of the University of California, who had been instrumental in creating the Master Plan, presided over the Carnegie Commission after he left the presidency of the University of California. The Commission produced the first broadly publicized Carnegie Classification of Higher Education Institutions in 1973 (Carnegie Commission, 1973).[1] The Carnegie Classification, modeled in many respects on the California Master Plan (McCormick & Zhao, 2005), became the dominant way of thinking about the organization of higher education in the United States. Like the Master Plan, the Carnegie Classification can be seen as an effort to impose order on an expanding and increasingly heterogeneous population of campuses–although in this case the purview was the entire United States, rather than only the state of California. Following the lead of the California Master Plan, the Carnegie Classification focused on highest degree awarded. It added criteria for marking off research from other doctoral-granting institutions and for distinguishing among baccalaureate-granting institutions those that were "liberal arts colleges" from those that were more mixed in curricular orientation. The Carnegie Classification went through several revisions over the years, but it remained very consistently focused around the highest degree institutions awarded. Research intensity was an important distinguishing factor among universities and liberal arts curriculum was an important distinguishing factor among colleges. By distinguishing between levels within ranks, the Carnegie Classification built in incentives for organizational ambition. Indeed, Kerr later expressed unhappiness about the amount of organizational striving the Classification had encouraged, as institutions lobbied to move up the levels in the Classification (McCormick & Zhao, 2005).

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[1] An early version of the Carnegie Classification preceded the 1973 version by two years but had limited circulation (McCormick and Zhao, 2005).

Table 1
The Carnegie Classification of Higher Education Institutions

Carnegie 1973	Carnegie 1994	Carnegie 2000	Carnegie 2005

Research Universities I
Research Universities II
Doctoral-Granting Universities I
Doctoral-Granting Universities II
Comprehensive Universities and Colleges I
Comprehensive Universities and Colleges II
Liberal Arts Colleges I
Liberal Arts Colleges II
Two-Year Colleges and Institutes
Professional Schools and Other Specialized Institutions
	Research I: Universities producing at least 50 doctorates and conducting more than $40 million federally-funded research per year
	Research II: Universities producing at least 50 doctorates per year and conducting more than $15.5 million in federally funded research
	Doctoral I: Universities producing at least 40 doctoral degrees per year in five or more disciplines.
	Doctoral II: Universities producing at least ten doctoral degrees in three or more disciplines, or 20 or more doctoral degrees in one or more disciplines.
	Masters I: Universities producing at least 40 master's degrees per year in three or more disciplines
	Masters II: Universities producing at least 20 master's degrees per year.
	Baccalaurate I: Institutions awarding at least 40 percent of their baccalaureate degrees in liberal arts fields; restrictive in admissions.
	Baccalaureate II: Institutions awarding fewer than 40 percent of their baccalaureate degrees in liberal arts fields; less restrictive in admissions.
	Specialized: Institutions offer degrees ranging from the bachelor's to the doctorate, and typically awarding a majority of degrees in a single field
	Associates: All two-year colleges awarding the associates degree
		Doctoral/Research-Extensive: Universities producing at least 50 doctoral degrees per year in at least 15 disciplines.
		Doctoral/Research-Intensive: Universities producing at least ten doctoral degrees per year across three or more disciplines, or 20 doctoral degrees per year overall.
		Masters I: Universities producing at least 40 master's degrees per year across three or more disciplines.
		Masters II: Universities producing at least 20 master's degrees per year.
		Baccalaureate-Liberal Arts: Institutions awarding at least half of their baccalaureate degrees in liberal arts fields.
		Baccalaureate- General: Institutions awarding less than half of their baccalaureate degrees in liberal arts fields
		Specialized: Institutions offer degrees ranging from the bachelor's to the doctorate, and typically awarding a majority of degrees in a single field
		Associates: All two-year colleges awarding the associates degree
			Doctorate-granting Universities. Includes institutions that awarded at least 20 research doctoral degrees during the update year (excluding doctoral-level degrees that qualify recipients for entry into professional practice, such as the JD, MD, PharmD, DPT, etc.).
			    RU/VH: Research Universities (very high research activity)
			    RU/H: Research Universities (high research activity)
			    DRU: Doctoral/Research Universities
			
			Master's Colleges and Universities. Generally includes institutions that awarded at least 50 master's degrees and fewer than 20 doctoral degrees during the update year (with occasional exceptions).
			    Master's/L: Master's Colleges and Universities (larger programs)
			    Master's/M: Master's Colleges and Universities (medium programs)
			    Master's/S: Master's Colleges and Universities (smaller programs)
			
			Baccalaureate Colleges. Includes institutions where baccalaureate degrees represent at least 10 percent of all undergraduate degrees and where fewer than 50 master's degrees or 20 doctoral degrees were awarded during the update year. (Some institutions above the master's degree threshold are also included.)
			    Bac/A&S: Baccalaureate Colleges—Arts & Sciences
			    Bac/Diverse: Baccalaureate Colleges—Diverse Fields
			    Bac/Assoc: Baccalaureate/Associate's Colleges
			
			Special Focus Institutions. Institutions awarding baccalaureate or higher-level degrees where a high concentration of degrees (above 75%) is in a single field or set of related fields.
			    Spec/Faith: Theological seminaries, Bible colleges, and other faith-related institutions
			    Spec/Medical: Medical schools and medical centers
			    Spec/Health: Other health profession schools
			    Spec/Eng: Schools of engineering
			    Spec/Tech: Other technology-related schools
			    Spec/Bus: Schools of business and management
			    Spec/Arts: Schools of art, music, and design
			    Spec/Law: Schools of law
			    Spec/Other: Other special-focus institutions
			
			Associate's Colleges. Includes institutions where all degrees are at the associate's level, or where bachelor's degrees account for less than 10 percent of all undergraduate degrees.
			    Assoc/Pub-R-S: Associate's—Public Rural-serving Small
			    Assoc/Pub-R-M: Associate's—Public Rural-serving Medium
			    Assoc/Pub-R-L: Associate's—Public Rural-serving Large
			    Assoc/Pub-S-SC: Associate's—Public Suburban-serving Single Campus
			    Assoc/Pub-S-MC: Associate's—Public Suburban-serving Multicampus
			    Assoc/Pub-U-SC: Associate's—Public Urban-serving Single Campus
			    Assoc/Pub-U-MC: Associate's—Public Urban-serving Multicampus
			    Assoc/Pub-Spec: Associate's—Public Special Use
			    Assoc/PrivNFP: Associate's—Private Not-for-profit
			    Assoc/PrivFP: Associate's—Private For-profit
			    Assoc/Pub2in4: Associate's—Public 2-year Colleges under Universities
			    Assoc/Pub4: Associate's—Public 4-year, Primarily Associate's
			    Assoc/PrivNFP4: Associate's—Private Not-for-profit 4-year, Primarily Associate's
			    Assoc/PrivFP4: Associate's—Private For-profit 4-year, Primarily Associate's
			
			Tribal Colleges. Colleges and universities that are members of the American Indian Higher Education Consortium, as identified in IPEDS Institutional Characteristics.
			    Tribal: Tribal Colleges

Clearly, quite a bit was left out of the Carnegie scheme. Institutional control was, for example, a meaningful distinction for many in higher education. Institutional control referred to whether colleges and universities were directly subsidized by state appropriations ("public") or dependent on tuition and endowment ("private"). The University of Illinois, for example, is a state-subsidized (or "public") institution, while Harvard University, also classified as a research/doctoral university in the Carnegie Classification, receives no direct state subsidy for educational provision and instead supports itself as a "private" university primarily from tuition and endowment income. The degree of selectivity in admissions was another meaningful source of division for many in U.S. higher education, and one correlated with the distinction between public and private institutions. Harvard and the University of Illinois are both research universities in the Carnegie scheme, but most members of the Harvard community do not think of themselves as very closely related to the University of Illinois, because it is much harder for students to be admitted to Harvard than it is for students to be admitted to the University of Illinois. Other identity categories mattered to particular sets of institutions. For example, minority-serving institutions and women's colleges were meaningful categories for administrators and alumni in those institutions. Similarly, Protestant –and Catholic– affiliated colleges were distinguishable as identity categories among institutions with those historical identities. Geographical scope –whether institutions are local, regional, or national in the scope of their admissions and service– might constitute another plausible base for classification. Institutions that enrolled many part-time students could be distinguished from those whose students were solely full-time. Institutions with high graduation rates could be distinguished from those with low graduate rates. Indeed, the number of potential bases for the classification of HEIs is all but inexhaustible.

Given the large number of other variables upon which classifications can be built, it is not surprising that competitors arose to contest the authority of the Carnegie Classification. Alexander Astin (1993), a higher education expert at UCLA, produced his own classification, separating universities by institutional control and colleges by their religious affiliations (or lack of religious affiliations), as well as by institutional control as public or private entities. Astin appears to have been motivated primarily by the desire to develop a more accurate description of the underlying structure of U.S. higher education. Subsequently, the higher education scholar Robert Zemsky of the University of Pennsylvania produced a "market-oriented" classification separating institutions by graduation rates and the proportion of part-time students they enrolled (Zemsky, Shaman, & Iannozzi, 1997). Zemsky and his colleagues explicitly grounded their classification in an effort to reflect "market segmentation" in the U.S. system.

Table 2
Alternatives to the Carnegie Classification

U.S. News & World Report 1983	Astin 1993	Zemsky, Shaman, and Ianozzi (ZSI) 1997	U.S. News and World Report 1999
National Universities: Reputational ranking of institutions by college presidents	Public Universities: Research, doctoral, and masters'-granting universities under public control.	Medallion: Five-year graduation rates of 75 percent or more in both public and private institutions.	National Universities: Ranking based on up to 16 indicators of "educational quality."
National Liberal Arts Colleges: Reputational ranking of institutions by college presidents	Private Universities: Research, doctoral, and masters'-granting universities under private control (including private, non-profit and religious control).	Name Brand: Five-year graduation rates from 60 to 74 percent for public universities and from 65 percent to 74 percent for private universities.	National Liberal Arts Colleges: Ranking based on up to 16 indicators of "educational quality."
Regional Universities: Reputational ranking of institutions by college presidents	Public 4-Year Colleges: Baccalaureate-granting colleges under public control.	Good Buys: Five-year graduation rates from 35 to 59 percent for public universities and from 40 to 64 percent for private universities.	Regional Universities: Ranking based on up to 16 indicators of "educational quality."
Regional Colleges: Reputational ranking of institutions by college presidents	Private Independent Colleges: Baccalaureate-granting colleges under private, not-for-profit control.	Opportunity: Five-year graduation rates less than 35 percent for public universities and less than 40 percent for private universities.	Regional Colleges: Ranking based on up to 16 indicators of "educational quality."
	Protestant Colleges: Baccalaureate-granting colleges affiliated with a Protestant religious Denomination.	User-Friendly: Institution's undergraduate degree production is less than 15 percent and part-time students comprise at least 25 percent of total student body.	
	Catholic Colleges: Baccalaureate-granting colleges affiliated with a Catholic order.		

Note: For National Universities and National Liberal Arts Colleges, the following indicators were used to determine rank (academic reputation survey-25%; student selectivity-15%; faculty resources-20%; retention rate-20%; financial resources-10%; alumni giving-5%; graduation rate performance (actual above expected)-5%. Student selectivity includes acceptance rate, yield, high school class standing in top 10%, and SAT/ACT scores. Faculty resources include faculty compensation; proportion of faculty with doctorates, full-time faculty, student-faculty ratio, proportion of classes with fewer than 20 students, and proportion of classes with 50 or more students. Retention rate includes graduate rate and freshmen retention rate. Most data reported by institutions. See Ehrenberg, 2000, p. 54.

Empirical approaches to higher education classification in the United States

Approaches like those discussed thus far are based on the analysts' prior conceptions of the consequential divisions among higher education institutions. These conceptions may be based on informed intuitions, based on years of experience, or policy interests that encourage the creation of divisions to realize perceived socially desirable goals in an efficient way. The Carnegie Classification appears to have been a mix of the two, linking informed intuitions with the policy goal to distinguish the functions of research-oriented universities, teaching-oriented universities, liberal arts colleges, and "community-serving" two-year colleges.

A difficulty with all a priori forms of classification is that they are ultimately based on informed intuitions about meaningful differences. These differences may or may not accurately represent the "underlying

reality" of affinity and distance between institutions. A conception that is badly out of alignment with the underlying reality runs the risk of becoming irrelevant or, in the worst case, an object against which opponents rally. The hope or expectation is that the conception will become widely accepted and from that point on will provide a meaningful order around which institutions in the field (and consumers) can organize. Skeptical social scientists are by nature doubtful that intuitions, however well informed, can be accurate. Many sociologists consequently advocate empirically grounded inductive statistical approaches to classification as a way to capture the underlying reality. As the sociologists Martin Ruef and Manish Nag (2011) have observed, "Only a quantitative model can systematically assess the homogeneity of underlying categories… that are applied across several thousand organizations and, possibly, (hundreds) of attributes" (p. 3).

In contrast to a priori approaches, empirical approaches are based on analysis of data with the intention to determine the underlying affinities and distances between institutions. My research group was, as far as I know, the first to subject the intuition of experts to an empirically grounded analysis of the structure of the U.S. higher education system (Brint, Riddle, & Hanneman, 2006). Rather than develop a conception of meaningful categories and then assign institutions to those categories, we allowed higher education institutions to "sort themselves" and we then defined the meaningful bases of differentiation from that sorting.

The study was based on a sample of institutions drawn from the Institutional Data Archive (IDA) on American Higher Education (Brint, Turk-Bicakci, Riddle, & Levy, 2003). We focused only on four-year colleges and universities, those that grant the baccalaureate or higher degrees. This is a distinct limitation of the analysis, because it does not include two-year community colleges, a large and important category of institutions in the United States. IDA collects data from 21 separate sources on U.S. four-year colleges and universities. Data has been collected at five-year intervals, beginning in 1970-71, and now extends to 2010-11. IDA over-samples selective colleges and universities, a small but influential sector of U.S. four-year colleges and universities. We created lists of institutions in each of four tiers and selected randomly for inclusion in the sample. When an institution declined our invitation to participate in the study, we invited the next institution on the selected list. In the sample, Tier 1 consists of highly selective liberal arts colleges and leading research universities. Tier 2 consists of other selective liberal arts colleges and doctoral granting universities. Tier 3 consists of master's granting comprehensive universities. Tier 4 consists of non-selective baccalaureate-granting institutions, many of them religiously affiliated. IDA includes 375 colleges and universities, approximately one-quarter of U.S. four-year colleges and universities.[2] Tier 1 includes 75 institutions. Tiers 2 through 4 include approximately 100 institutions each.[3]

First, we asked how structural characteristics of colleges and universities clustered empirically. We used the statistical technique of cluster analysis as the underpinnings for this analysis. It is important to emphasize that even putatively empirical approaches to classification are not innocent of conceptualization. Instead, they are based on ideas about the kinds of characteristics that are likely to be important in the organization of the field. The empirical aspect comes from letting institutions group themselves once the bases of grouping are specified.

We chose variables on which to group institutions with organizational theory in mind. The organizational theories on which we drew suggest that resource dependencies (Pfeffer & Salancik, 1978), status hierarchies (Polodny, 1993), and adaptive capacities (Blau, 1973) are important characteristics underlying organizational identities and behaviors. Resource dependencies encourage organizations to be sensitive to the interests of primary resource providers. Status provides a leadership position and improved market position for some organizations, allowing them to monopolize large proportions of the valued goods within a system. Adaptive capacities, either due to wealth or size, allow for greater efficacy in responding to environmental incentives and challenges. In the case of HEIs, expressed mission can be considered another important feature of the structure of the system. Institutions arrange themselves in terms of the missions they represent to the world. These can include, for example, a focus on practical training as preparation for the labor market or an emphasis on intellectual and character development linked to the liberal arts tradition (Clark, 1970).

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2   IDA excludes specialized institutions, such as theological seminaries, art institutes, and business colleges.
3   Because part of our approach to validation involved examining the self-identified reference institutions of presidents, the sampling frame was limited to institutions whose presidents returned surveys that included questions about reference institutions. Of the 375 surveys that were sent to presidents, 304 were returned for a response rate of 81 percent.

We included variables closely connected to resource dependency (institutional control), status (selectivity, tuition price), and adaptive capacity (size, operating budget/student). Most measures were taken from the Integrated Post-secondary Educational Data System (IPEDS) for academic year 1999-2000. Institutional control was measured as a dichotomy, public or private. Selectivity was measured as average SAT or ACT test scores of incoming freshmen, and adopted from data collected by the Higher Education Research Institute at UCLA. Although control and status are often related, with private institutions in the United States tending to be more prestigious, this is not invariably the case. Some public institutions, such as the University of California, Berkeley and the University of Michigan-Ann Arbor, are among the most prestigious institutions in the country, while some private institutions must provide steep tuition discounts to attract classes. Tuition price was measured in 1999 dollars. Size was measured as fall head count enrollment. Operating budget was logged to normalize the distribution. Historically, two important missions in U.S. higher education are the access/practical training mission of land grant universities and the intellectual and character development mission of liberal arts colleges. As a proxy measure for these historically important institutional missions, we included another variable: proportion of liberal arts to occupational-professional degrees. We developed this variable by grouping degree fields as either "arts and sciences" or "occupational-professional" and coding completions in our sample institutions from IPEDS degree data. Finally, we included our institutions' Carnegie Classification category. We did so mainly to identify institutions by highest degree awarded, another status measure, but also in recognition of the Carnegie Classification's influence on the self-understanding of leaders of academic institutions.[4]

Cluster analysis allows for the aggregation of individual patterns of linkage into larger groups on the basis of measures of similarity. We used an agglomerative method that produced clusters whose centroids are constrained to be far apart from one another. No definitive statistical criteria exist to determine the "correct" clustering solution. Clustering algorithms provide solutions ranging from the most disaggregated (each institution in its own group of one) to the most aggregated (the unity of all institutions in the sample). Judgments about where to stop in this process –that is, judgments about the "correct" solution– are based on the interpretation of standard diagnostic tests and, at least equally, on the analysts' sense of a meaningful solution. Our choice of the number of clusters was guided by Akaike's Information Criterion (AIC), a measure of residual error in the assignment of cases to clusters (Long, 1997, pp. 109-110). A meaningful solution can be defined as a solution that satisfies diagnostic criteria, makes substantive sense, and culminates at a sufficiently high level of aggregation so as to be meaningful.

As a result of the cluster analysis, we found that the U.S. four-year colleges and universities in our sample could be characterized as organized along three dimensions: (a) by highest degree offered, (b) by selectivity, and (c) by private or public control. Not all possible cells in the matrix produced by these three parameters were filled. Instead, the cluster analysis yielded a seven-category solution. Beginning at the top: (a) highly selective private colleges and universities, like Williams College, Harvard University, and Stanford University, (b) large, mainly public research universities, like the University of California at Berkeley and the University of Michigan-Ann Arbor, (c) other doctoral-granting universities (both public and private), (d) other selective baccalaureate-granting colleges, (e) private master›s granting universities, (f) public master›s granting universities, and (g) nonselective private baccalaureate granting colleges. In the United States many nonselective baccalaureate-granting colleges are religiously affiliated. Clearly, this structure has only a very limited correspondence to the Carnegie Classification system as it existed during the period of its greatest influence. Neither selectivity nor control was an important feature of the Carnegie Classification. The empirical structure we discovered through cluster analysis has still less of a correspondence to the recent form of the Carnegie Classification, which now includes 33 categories in its "basic" classification (Carnegie Foundation for the Advancement of Teaching, 2012).

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[4]   In sum, we examined seven covariates of institutional structure: (1) Carnegie classification (in 1994), (2) source of control (public or private), (3) 1999 head count enrollment size, (4) selectivity, as measured by 1999 average SAT or ACT test scores of incoming freshmen, (5) 1999 tuition price, (6) log of 1999 operating budget, and (7) 1999 percentage of degrees awarded in arts and sciences (as opposed to occupational-professional fields). For additional details, see Brint, Riddle, and Hanneman (2006).

Table 3
Brint, Riddle and Hanneman "Institutional Clusters" (2006)

1) Highly selective private colleges & universities
2) Large public research universities
3) Other doctoral universities
4) Public masters-granting universities
5) Private masters-granting universities
6) Selective Baccalaureate-granting colleges
7) Non-selective Baccalaureate-granting colleges

Note: Based on clustering of the following institutional characteristics: Carnegie classification (1994), control (public/private, not-for-profit), 1999 head count enrollment, tuition, log of 1999 operating budget, average 1999 SAT/ACT score, and 1999 percent of students graduating with arts and sciences (as opposed to) occupational-professional) degrees.

We allowed institutions to sort themselves also in a second way. We asked presidents of IDA colleges and universities to identify up to eight institutions they considered to be similar to their own. This is a perceptual form of classification based on the reference group concept; it asks presidents to select a set of reference institutions and then assumes that these reference sets define categories of similar institutions.

We showed that our "institutional clusters," as we called them, corresponded well to the patterns of presidential reference choices. We considered a "very good fit" to be one in which four-fifths of the presidential choices of current reference institutions were within-category. By "within-category" we meant choices of other institutions in the institution's category. We considered a "good fit" to be one in which two-thirds of the choices were within-category. We considered a "minimally acceptable" fit to be one in which half of the choices were within-category. Using these criteria, presidential reference choices in one of the clusters –large public research universities– showed a "very good" fit. More than four-fifths of presidents chose other large public research universities as similar to their own. Presidents in two other categories –elite private colleges and universities and public master's granting institutions– had within-category selections at the level of two-thirds, a "good fit" using our criteria. In the other four cases, within-category choices were at the level of 50 percent or above, indicating a minimally acceptable fit. Thus, presidents tended to choose institutions that, according to the cluster analysis, were structurally like their own institutions, although they did not always choose such institutions (Brint, Riddle, & Hanneman, 2006).

This level of correspondence stood in some contrast to the performance of the classification schemes to which we compared the institutional clusters derived from our inductive statistical approach. One, Alexander Astin's 1993 classification, performed nearly as well in terms of presidents' propensity to make within-category choices, but two categories in the Astin classification failed to meet the standard of a minimally acceptable fit. The other three classifications did not show high levels of predictive success either in presidents' propensity to make within-category selections or in terms of the number of classificatory categories meeting the 50 percent criterion we established as a minimally acceptable fit.

Table 4
Proportion of presidential within-category choices of reference institutions, by classification ccheme (N of presidents)

1. Brint, Riddle & Hanneman (BRH) 2006		2. Astin 1993	
Elite Private Colleges and Universities	.67 (27)	Private University	.76 (53)
Large Research Universities	.85 (27)	Public University	.92 (104)
"Other Doctoral" Universities	.51 (25)	Independent College	.67 (40)
Private Masters-Granting Universities	.55 (33)	Protestant College	.52 (50)
Public Masters-Granting Universities	.67 (31)	Catholic College	.31 (6)
Selective Baccalaureate-Granting Colleges	.55 (35)	Public College	.47 (19)
Non-Selective Baccalaureate-Granting Colleges	.56 (40)		
		Average:	.61
Average:	.62	# Categs. Below 50%:	2
# Categs. Below 50%:	0		
3. Carnegie 1994		4. Carnegie 2000	
Research I	.91 (39)	Doc./Res. Extensive	.93 (52
Research II	.18 (9)	Doc./Res. Intensive	.35 (29)
Doctoral I and II*	.51 (25)	MA I	.62 (68)
Masters I	.63 (70)	MA II	.08 (18)
Masters II	.11 (12)	BA Liberal Arts	.82 (61)
BA I	.87 (56)	BA General	.41 (42)
BA II	.54 (56)		
		Average:	.54
Average:	53		
# Categs. Below 50%:	2	# Categs. Below 50%:	3
5. Zemsky, Shaman & Iannozzi 1997			
Very High Grad Rate	.85 (32)		
High Grad Rate	.40 (43)		
Medium Grad Rate	.36 (76)		
Low Grad Rate	.11 (19)		
Very Low Grad Rate	.48 (48)		
Average:	.44		
# Categs. Below 50%:	4		

Note: * Carnegie Doctoral I and II collapsed due to small sample N.

This brings me to the first analytical point mentioned in the introduction to this paper. Generalizing from the California case, Kerr thought doctoral granting institutions would focus on research, master's granting institutions would focus on practical, job-related training at both the baccalaureate and master's level; and smaller baccalaureate granting institutions would instill values and teach the liberal arts and sciences. Our analysis indicates that the underlying structure of the system was, in contrast, always partly constructed on the basis of status resources and relations of resource dependency.

It is tempting to conclude that the empirical approach represents a superior method for developing classifications. However, I think it unwise to draw this conclusion. Instead, my conclusion is mixed. On the one hand, a priori conceptualizations that are badly out of correspondence with the "underlying reality" are unlikely to shape organizational behavior in meaningful ways. Our analysis suggests that selectivity and institutional control –two characteristics that did not figure prominently in the Carnegie Classification– have been structurally important features of the U.S. higher education system. The existence of organizations such as the Consortium for the Financing of Higher Education (COFHE), an association of selective private institutions, suggests that the leaders of highly selective private research

universities often consider their interests to intersect more closely with those of leaders of well-endowed private colleges more than with those of leaders of public research universities. Moreover, the analysis suggests that presidents also saw these characteristics as important features of the system to which they oriented themselves and, by extension, their institutions. At the same time, I recognize that human consciousness works through conceptualization, whether or not that conceptualization accurately reflects an underlying empirical reality. Indeed, insofar as a priori classifications become influential, they begin to structure reality according to their design. Brint, Riddle, and Hanneman (2006) recognized the power of influential classifications by including the Carnegie Classification as one of our input variables.

We relied on cluster analysis and reference group analysis to assess the underlying *current* empirical reality. We also conducted a third analysis based on a question asking the presidents to identify up to eight institutions they would like to resemble in the future. This allowed us to look at "aspirational peers, in addition to current peers.[5] Based on their choices of institutions they would like to resemble in 10 years' time, some presidents showed themselves to be content with their current situations; they mainly chose institutions within their current category as aspirational peers. Within-category choices were particularly common of presidents of institutions at the top of the hierarchy, the elite private and the large public research universities. But elsewhere in the system we could see considerable restlessness and desire for change. As indicated in Table 5, presidents of other doctoral-granting institutions, public master's-granting universities, private master's-granting universities, and nonselective private baccalaureate-granting colleges were all less likely to make within-category choices to describe their aspirational peers than they were to make within-category choices to describe their current peers.

Table 5
Current and Aspiration Reference Sets, BRH Institutional Clusters

	Current reference sets							
	Elite privates	Large Rus	Other Doctoral	Public Mas	Private Mas	Selective Bas	Non-Selective Bas	N
Elite Privates	.67	.10	.01	.00	.01	.21	.01	27
Large RUs	.09	.85	.07	.00	.00	.00	.00	25
Other Doctoral	.02	.20	.51	.20	.06	.01	.00	31
Public MAs	.03	.06	.18	67	.02	.04	.00	33
Private MAs	.09	.05	.05	.02	.55	.11	.13	27
Selective BAs	.28	.01	.01	.00	.08	.55	.06	35
Non-Selective BAs	.01	.01	.00	.03	.29	.11	.56	40

	Aspiration reference sets							
	Elite Privates	Large Rus	Other Doctoral	Public Mas	Private Mas	Selective Bas	Non-Selective Bas	N
Elite Privates	.67	.05	.00	.03	.03	.21	.01	26
Large RUs	.14	.86	.00	.00	.00	.00	.00	20
Other Doctoral	.08	.43	.24	.18	.05	.01	.00	30
Public MAs	.09	.12	.24	.48	.04	.02	.02	31
Private MAs	.16	.12	.00	.01	.36	.29	.06	25
Selective BAs	.48	.01	.02	.01	.03	.44	.01	31
Non-Selective BAs	.06	.00	.00	.01	.27	.36	.36	41

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[5] Not all presidents responded to the survey and, among those who responded, not all filled out the questions on reference institutions. Consequently, our final sample consisted of 275 presidents who completed the question on current reference institutions, and 253 presidents who completed the question on institutions they aspired to resemble.

Patterns of presidential aspirations tended to follow paths related to their institutions' current structural locations. The presidents of upwardly mobile private institutions sought to become more selective and thereby to raise their tuitions, creating a stronger economic base for maintaining quality. By contrast, the presidents of upwardly mobile public institutions sought to move up by becoming more heavily committed to graduate and professional training and research activities. These patterns express differential incentives that are connected to a reliance on private tuition dollars versus state subsidies. Private tuition rises with selectivity. For public institutions, limited by legislatures in their tuition charges, the main way to gain status has been to conduct more and better research. These analyses also showed that upwardly-mobile presidents within each category tended to be from the stronger institutions in those categories. We separated "strivers" (those with a preponderance of future choices outside of their current category) from "non-strivers" (those with a preponderance of future choices within their current category). Within each of the six institutional clusters below the elite privates, the strivers tended to have higher tuitions, larger operating budgets, students with higher test scores, and curricula that were more likely to emphasize liberal arts and sciences degrees than the non-strivers.

This brings me to the second analytical point mentioned in the introduction. The Master Plan viewed a stratified system as essential to regulate competition along the lines established by the classification scheme (Liaison Committee, 1960). Kerr himself observed the threats to the University of California posed by unregulated competition for academic eminence, particularly the interest of the California State Universities in offering the doctorate (Kerr, 2001, pp. 173-174). For Kerr, resources were wasted when master's granting institutions strove to offer the doctorate and when two-year colleges strove to add baccalaureate programs. Undoubtedly, Kerr was right to see the wastefulness of unregulated competition. At the same time, my research suggests the leaders of colleges and universities value the opportunity for mobility, and a good case can be made that upward mobility aspirations encourage institutions to perform at a higher level than they otherwise would, just as people who are upwardly mobile often perform at a higher level than those who are not upwardly mobile (Merton & Kitt, 1950; Polodny & Baron, 1997). We observe further confirmation of this principle in our finding that presidents of stronger institutions were the ones most likely to harbor ambitions for upward mobility. It follows that systems should be open enough to encourage realizable aspirations for upward mobility, rather than severely limiting those aspirations through rigid differential funding schemes.

Recent developments: Fine distinctions and multiple dimensions

I now turn to a discussion of recent developments in the classification of HEIs in the United States. These developments suggest that the era of bold, single-dimension classifications may be ending. The Carnegie Classification was revised in 2005 and 2010 in ways that made it arguably more precise than before, but also, in my view, much less useful than before. Today, the "basic" Carnegie Classification includes 33 categories. Fine distinctions developed, in particular, for two-year associate degree granting institutions. Once encompassed by a single category, by 2010 community colleges were split into 14 separate categories, depending on control and curricular specialization. Equally important, Carnegie adopted several additional classification schemes to complement the "basic" classification. These included undergraduate and graduate program classifications, enrollment profiles, undergraduate program profiles, size and setting classifications, and special purpose classifications including an elective classification for institutions that saw themselves as highly engaged with their surrounding communities.

An article by McCormick and Zhao (2005), the architects of the revised classification, documented the rationale for this profusion of categories and classificatory dimensions. The value of classification, McCormick and Zhao wrote, is closely linked to its intended use. Because classifications are used for a variety of purposes, no single classification can be adequate. They also note the "significant danger" of reification. Categories easily become taken for the things they represent. The latter are inevitably more complex that the categories that come to stand for them. This leads to dissatisfaction with the classification on grounds of accuracy. In addition to these philosophical concerns, political concerns also appear to have figured in the decision to add categories and dimensions. McCormick and Zhao observed that many institutions did not like to be classified. The leaders of these institutions partly objected on grounds of principle; they found that classifications tended to "privilege one element of institutional mission… over others judged equally or more important" (McCormick & Zhao, 2005, pp. 54-55). Institutions liked to represent themselves in ways that put their qualities in the best possible

light. As McCormick and Zhao put it, classifications "run counter to the rhetoric of distinctiveness on our campuses." Marketability clearly mattered to institutions and the Classification did not always help institutions to market themselves effectively. Carnegie consequently found itself in the "uncomfortable position" of trying to preserve the integrity of its classification without harming the institutions whose support was necessary for its own legitimacy. The 2010 revision opted to play down continuity in favor of letting institutions identify their own value by choosing the dimensions on which they wished to be classified.

Interestingly, empirical approaches to classification have also moved toward offering an expanding number of categories and multiple dimensions of classification. Princeton University sociologists Martin Ruef and Manish Nag (2011) recently classified HEIs into three distinct property spaces based on (a) institutional characteristics, (b) student demographic characteristics, and (c) narratives of institutional mission.[6] Ruef and Nag modeled the assignment of organizations to categories using a set of algorithms, focusing in particular on Latent Dirichlet Allocation (LDA), a probabilistic topic model (Blei, Ng, & Jordan., 2003). By design, they limit the distinctions to 18 in each of the three property spaces (or 54 altogether).

Ruef and Nag's analysis of institutional characteristics reveals more distinctions among colleges and universities at the bottom of the hierarchy than among those at the top. In a result similar to the 2010 Carnegie classification, their results divide two-year colleges into nine separate categories based in large part on the specific type of curricula offered (such as cosmetology or technology-centered programs). Their demographic analysis leads to divisions at lower ends of the hierarchy among predominantly male and predominantly female colleges, connected to the gendered nature of curricula offered. They found, for example, divisions in the empirical analysis between nursing and electronic technology oriented programs. They found that universities, by contrast, were divided demographically principally by the extent to which they enroll mainly full-time students or full-time and part-time students. They found finer distinctions in mission among more selective institutions of higher learning than among broad-access institutions. They distinguished, for example, between universities that emphasize research and those that highlight the diversity and values of their students. The mission statements of selective colleges were divided among those that embrace a global mission; those that highlight the classical liberal arts curriculum; and those that advocate a "progressive" social justice agenda. By contrast, mission statements in broad access institutions tend to be differentiated by career tracks –for example, a focus on cosmetology or medical technology–rather than by these value statements or educational priorities.

Like McCormick and Zhao, Ruef and Nag emphasize that colleges and universities can be interpreted as pursuing multiple interests and should therefore be classified along several dimensions. They note that an important development in recent work on organizations has been "to recognize that membership in categories is often fuzzy and partial, rather than conforming to the crisp boundaries proposed by traditional approaches to classification" (Ruef & Nag, 2011, p. 4). The work of organizational theorist Miller McPherson (1983) underlies this preference for partial and fuzzy categories. McPherson argued that the ecology of organizations should be understood in terms of a duality between their internal structures and the niches they fill within the larger ecology, a duality in which "niches define forms and forms define niches." Moreover, organizations are constantly searching for niches that are compatible with their evolving forms. In the face of such fluidity, categorization by internal characteristics, such as size or control, becomes suspect.

The 2010 Carnegie Classification and the recent work of Ruef and Nag represent what is a more general intellectual trend: the rising appreciation of heterogeneity and instability in the conceptualization of cultural and organizational fields. Theorists of postmodernism would call this shift an example of

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[6]   In their modeling of institutional characteristics, Ruef and Nag (2011) include many variables that my group chose not to include, such as full-time versus part-time students, curricular emphases, and special off-campus study opportunities. These choices reinforce the point that, in empirical approaches, the choice of input variables is conceptual. I believe such choices should be well grounded in organizational theory. Ruef and Nag do not explicitly address the reasons for their choices of input variables. It is worth noting that they did not include other possible candidate variables, such as proportion of students in fraternities or sororities or size of the athletic budget. Inclusion of these variables might have affected their results, just as they might have affected our results. Even inductive approaches are not innocent of cultural content; what comes out of empirically based modeling depends, in large part, on what variables go into the generation of empirical results. Consequently, the importance of these variables should be very well justified and not represent a mere potpourri. The old saying "garbage in, garbage out" is very relevant to all empirical approaches to classification.

the "decline of master narratives" (Lyotard, 1984). Clearly this appreciation has numerous sources, philosophical, political, and observational. Whatever the sources, it appears to be a quite general cultural development in advanced industrial societies: the evolution of European higher education classification shows a similar pattern emphasizing multiple dimensions of classification (Ziegele, 2012).

This brings me to the third analytical point mentioned in the introduction. Recent approaches to classification run the risk of producing too much information to be truly useful. The human mind, as G.A. Miller (1956) observed, appears to have distinct limits when it comes to recalling meaningful categories. Miller wrote of the "magic number seven, plus or minus two," meaning that the average person can recall approximately seven chunks of information. (He acknowledged a range between two and 15.) Subsequent studies have cast doubt on the "magic" of the number seven.[7] Nevertheless, it is clear that an upper limit exists and that this upper limit is lower than the 54 presented by Ruef and Nag or the 33 presented in the 2010 "basic" Carnegie Classification. One of the virtues of the early Carnegie Classifications is that they respected the upper limit of human memory capacity. Between 1973 and 2000, the Classification focused on six major categories (research universities, other doctoral institutions, masters' granting comprehensives, baccalaureate granting, associates granting, and specialized institutions),[8] and consequently fell within Miller's "magical number" limit.[9] The same is true of the level of aggregation adopted by my group in our otherwise quite different approach to classifying HEIs. If classifications are not useful for purposes of conveying the structure of higher education systems in a way that can be easily apprehended by the human mind, they are not likely to be broadly relevant. Where influence is the intent, the tilt should be toward meaningful parsimony over forgettable precision.

Recent developments: The rise of rankings

The other major development has been the triumph, particularly in the commercial arena, of wealth and status as the sine qua non in higher education ranking. Rankings constitute an analytically distinct form of classification from more familiar forms that establish equity within ranks. Instead of grouping like institutions, they differentiate similar institutions on fine distinctions related to referenced criteria. Classification is a method for apprehending the structure of a system; ranking is a method for stimulating competition among those at a similar level in the system. Rankings have the universal appeal of all forms of competition in which only a few emerge as champions.

The most important rival to the Carnegie Classification since the 1980s has been the *U.S. News and World Report* (*U.S. News*) rankings. Indeed, it is safe to say that the *U.S. News* rankings have replaced Carnegie as the most influential "classification scheme" for most colleges and universities, in spite of the widely recognized biases in these rankings.[10] Instead of classifying institutions, *U.S. News* ranked them within categories. These categories, renamed from the Carnegie Classification, include "national universities," "regional universities," and "liberal arts colleges." *U.S. News* also conducts separate rankings of professional schools, such as business schools, medical schools, and law schools (Hopkins, 2012). *U.S. News* is intended to provide a guide to "educational quality," and it uses a wide variety of indicators to develop its quality measures. These include: a reputational survey, the number of small classes as a proportion of the whole, actual over expected graduation rate, and proportion of alumni who donate annually (Morse & Flanigan 2012). The *U.S. News* rankings elicited great public interest from the beginning. In 2007, for example, the *U.S. News* college rankings issue received 10 million page views on the Internet (Freedman, 2007). They also began to dominate significant amounts of institutional energy;

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7 Baddely (1994) observed that "it is unlikely that the limit is set purely by the number of chunks, independent of such factors as the degree to which material within each chunk integrated is the result, for example, of prior learning" (p. 55).

8 Tribal colleges, attended by Native Americans and few in number, were included as a seventh category in the Carnegie Classifications.

9 Many of these categories were subdivided into two levels, but these subdivisions failed to tax cognitive boundaries, because they were all labeled similarly: Research Universities I and II, Masters Granting Universities I and II, etc.

10 The biases of the *U.S. News* rankings have been widely discussed (see, e.g.; Myers & Robe 2009; NORC, 1997; Thompson, 2000). First, *U.S. News* only considers sectors in which well-educated magazine readers are interested. Second, public universities do not enroll students whose test scores are uniformly as high as those of students enrolled in places like Harvard and Stanford, and they cannot offer as many small classes. Consequently, for many years, not a single public university appeared in the top 20 national universities. Third, in spite of *U.S. News's* claim that its rankings are based on more than a dozen separate and distinctive indicators of "educational quality," I calculated that as much as 70 percent of the variance in *U.S. News* rankings could be explained by one variable: the average standardized test scores of incoming students (Brint, 2007). Others have come up with similar results (Pascarella, 2001).

moving up even a spot or two at the top of the rankings could lead to large increases in applications for admission, and therefore a stronger reputation for selectivity, as well as large increases in alumni donations (Ehrenberg, 2000, chap. 4).

This brings me to the fourth analytical point mentioned in the introduction. In the most advanced societies, rankings threaten to overshadow classification. This is true not only because of the universal appeal of competition, but also because of the strong interests of powerful institutions. As compared to rankings, classification is of little interest to institutions at the top of the hierarchy. They know they are strong institutions, and they know their type. Because higher education admissions is a competitive arena in which thousands of students vie for only a relatively few places at the top of the system, these institutions can gain only from deepening their reputation as the best or one of the best of their type. To gain such a reputation means moving up in the ranks. By doing so, they gain more applicants for admission. With more applicants, they can become more selective. As they become more selective, they can guarantee that they admit only students who are likely to do very well in later life. These students, thankful for the benefits of their prestigious educations, are more likely to become loyal to their institutions, including as donors and employers of graduates. Faculty members too want to teach at the best institutions. Once an institution has achieved the reputation as the finest in its category, it has its opportunity to choose among the most productive and creative scholars and scientists to add to its faculties (Allison & Long, 1987).

Again, we see a general pattern. On the world stage, the Shanghai Jiao Tong academic rankings of world universities (ARWU) have generated a similar level of interest among higher education experts, university leaders, and Ministry of Education policy makers (Salmi, 2012). The same concentrated efforts to move up the ARWU rankings now capture the attention of leaders of top American research universities who were once content to train their energies on moving up a peg or two on the *U.S. News* rankings (Altbach, 2010). A similar level of interest has developed in Europe (Rauhvergers, 2011).

By contrast, less prestigious institutions have little interest in competing. If institutional leaders do not have the resources to compete for rank along the established criteria, they are unlikely to find rankings to be of much interest or value. They squander resources competing and gain little from the effort. They are simply too far behind to rank well. This fosters a general opposition to rankings or a search for ranking systems that will show the institution in a more positive light. The popularity of the Carnegie Foundation's "community engagement" classification is a tribute to the growing importance of service to surrounding communities among institutions that cannot compete successfully on the quality of their students or faculty members. Similarly, some socially conscious institutions have found The Washington Monthly (2012) rankings to be valuable sources of legitimacy and publicity. *Washington Monthly* ranks partly on educational quality, but also on social contribution (as measured by the proportion of first-generation college students enrolled and demonstrated high levels of community engagement).

Discussion and application to Chilean higher education institutions

I now turn to an application of the U.S. experience to the Chilean case. I will focus on the use of a priori classification to influence organizational behavior. I will discuss ways in which additional empirical analysis can be valuable in subsequent development of a classification for HEIs in Chile. I will not discuss the recent developments in classification in the United States and Europe because these developments are less relevant to a system in which classification is still under development.

Until recently HEI classification in Chile consisted of the division between "traditional" and "private" universities, professional institutes, and technical training centers. The traditional universities were members of the Council of Rectors of Chilean Universities (CRUCH), and they enjoyed the financial privilege of state support. Recently, the Chilean Ministry of Education has developed a new classification of CRUCH universities to be used as a foundation for allocation of basal and performance funding (Reich, 2012). The new classification, based partly on an analysis of the research productivity of Chilean universities (Reyes & Rosso, 2011), divided the CRUCH universities into three categories: (1) those prioritizing teaching, research, and Ph.D. programs (category 1); (2) those prioritizing teaching and specialized research (category 2); and (3) those prioritizing teaching (category 3). The system can be characterized as a mix of a priori and empirical approaches; it is a policy-driven form of classification anchored by empirical analysis.

This classification creates a meaningful distinction among the CRUCH institutions and a well-designed set of criteria for measuring performance among the three categories of universities. These criteria address the distinctive characteristics of institutions in each tier. For example, only "category 1" institutions are expected to submit the annual number of publications their faculties produce per capita. By contrast, only "category 3" institutions are expected to submit the percentage of students they enroll from the bottom three quintiles and the proportion of students they retain in the first year. At the same time, the new classification it appears not to address the interests of universities and other HEIs outside the CRUCH universities. Important questions arise in this context: Should policy makers also develop distinctions among these other institutions? If so, on what grounds should these distinctions be developed? Should some be encouraged to aspire to upward institutional mobility, or should these aspirations be constrained by equity in budgetary allocations? If they are to be encouraged, by what methods can they be encouraged?

My research suggests that the empirical approach can be used to identify not only government-supported universities, but also those that support themselves entirely through private means. Through empirical analysis using meaningful metrics, it is possible to determine whether some institutions are strong and ambitious enough to make the jump to higher levels in the structure of higher education, given sufficient encouragement by state policy or market incentives. The "official" reality can shape organizational behavior, but undefined distinctions and unsupported aspirations among institutions falling beyond the scope of classification can also weaken the practical force of public policy.

If the trends discussed in this paper are applicable to Chilean HEIs, we can expect the private universities outside the CRUCH framework, the professional institutes, and the technical training centers to seek identities that show their instructional and social service activities in the best light. They may, for example, seek recognition for their success in improving the measurable skills of entering students or for graduating first-generation students or for their deep engagement with their surrounding communities. It is possible to imagine a system in which policy goals are integrated into classification by incorporating the realistic aspirations of these institutions. Thus, Chilean policy makers may wish to separate non-CRUCH institutions by levels of teaching excellence, as measured by learning gains, the difference between actual as compared to expected graduation rates, or other measures. They may also wish to separate technical training centers by their levels of community engagement, as measured by job placement, partnerships with local and regional entities, or other statistics relevant to the objectives of these institutions. In this way, policy goals can be realized through classification at the same time that opportunities for mobility within the structure can be encouraged. By ignoring policy outcomes for institutions that are not supported by government funds, the new classification developed by the Ministry misses an important opportunity to influence the behavior of a wider range of institutions.

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