The Academic Caste System: Prestige Hierarchies in PhD Exchange Networks

Val Burris
University of Oregon

The prestige of academic departments is commonly understood as rooted in the scholarly productivity of their faculty and graduates. I use the theories of Weber and Bourdieu to advance an alternative view of departmental prestige, which I show is an effect a department's position within networks of association and social exchange—that is, it is a form of social capital. The social network created by the exchange of PhDs among departments is the most important network of this kind. Using data on the exchange of PhDs among sociology departments, I apply network analysis to investigate this alternative conception of departmental prestige and to demonstrate its superiority over the conventional view. Within sociology, centrality within interdepartmental hiring networks explains 84 percent of the variance in departmental prestige. Similar findings are reported for history and political science. This alternative understanding of academic prestige helps clarify anomalies—e.g., the variance in prestige unconnected to scholarly productivity, the strong association between department size and prestige, and the long-term stability of prestige rankings—encountered in research that is based on the more conventional view.

Extensive research demonstrates the importance of departmental prestige for the career prospects of academic professionals. The prestige of the department in which an academic received a PhD consistently ranks as the most important factor in determining the employment opportunities available to those entering the academic labor market. Across a range of academic fields, studies report a high correlation between the prestige of the departments in which academics received their degrees and the prestige of the departments where they obtained jobs, especially their initial jobs (Caplow and McGee 1958; Berelson 1960; Crane 1965; Hargens and Hagstrom 1967, 1982; Shichor 1970; Zuckerman 1970; Cole and Cole 1973; Long, Allison, and McGinnis 1979; Reskin 1979; Baldi 1995). This effect holds independently of differences in pre-employment productivity (Long 1978; Long, Allison, and McGinnis 1979; McGinnis and Long 1988; Baldi 1995). Moreover, through a process of cumulative advantage, academic scientists and scholars who secure employment in the more prestigious departments gain differential access to resources and rewards that enhance their prospects for subsequent career recognition (Merton 1968; Reskin 1977, 1979; Long 1978; Long, Allison, and McGinnis 1979; Long and McGinnis 1981; Allison, Long, and Krauze 1982; McGinnis and Long 1988; Keith and Babchuk 1994; Zuckerman 1988). This cycle results in a stratified system of departments and universities, ranked in terms of prestige, that is highly resistant to change.

Although the existence of a well-institutionalized and self-perpetuating prestige hierarchy

Direct all correspondence to Val Burris, Department of Sociology, University of Oregon, Eugene OR 97403 (vburris@oregon.uoregon.edu).
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in academic employment has long been recognized, the structural properties of this stratification system rarely have been subjected to systematic research. More commonly, studies use individual scholars or departments as the unit of analysis when examining the relative importance of various factors that are hypothesized to predict department prestige and the employment outcomes of individual PhDs. These studies have taught us much about how the academic marketplace functions but still leave us with many unanswered questions. Most important, the concept that stands at the center of this research—departmental prestige—remains elusive and inadequately theorized.

I depart from the usual practice of treating prestige as an *attribute* attached to individual faculty or departments. Instead, I elaborate an explicitly *structural* understanding of prestige, which I conceptualize as an *effect* of the position of academic departments within *networks* of association and social exchange—that is, as a form of *social capital*. Undoubtedly, there are multiple social networks through which departmental prestige, as a form of social capital, circulates and accumulates. The most important network, I argue, is that formed by the exchange of PhDs (or, equivalently, the exchange of jobs) among departments.[1] This manner of conceptualizing departmental prestige brings us full circle; not only does departmental prestige influence the structure of academic employment, it also is itself an artifact of that employment structure.

In the following section I discuss the conventional view of academic prestige and empirical research that points to the limitations of this concept. The next two sections lay the theoretical foundation for an alternative understanding of academic prestige as a form of social capital. The following sections then summarize the results of an empirical study that employs data on hiring networks within sociology and two other disciplines to operationalize this alternative concept of academic prestige and demonstrate its superiority over conventional measures. In the conclusion, I consider the broader implications of these findings for the stratification of academic disciplines.

THE CONVENTIONAL VIEW

The common understanding of academic prestige (and its impact on academic careers) interprets the prestige ranking of departments as resting on the scholarly accomplishments of the faculty employed and the graduates trained by those departments. This is consistent with Merton's (1973) classic formulation of the normative ethos of science, which asserts that the assessment of quality and the distribution of rewards in scientific fields (and, by extension, other academic disciplines) are governed by the meritocratic application of universalistic criteria. From this perspective, high-ranking departments are presumed to be those with highly productive faculty, and graduates from those departments are preferred within the academic marketplace because of the expectation that they, too, will be highly productive scholars (Long and Fox 1995).

However important universalistic criteria may be within the normative ethos of academic institutions, there are nevertheless empirical problems with this view of departmental prestige and its effects. Numerous studies have investigated the presumed association between faculty productivity and departmental prestige (Cartter 1966; Hagstrom 1971; Cole and Cole 1973; Keith and Babchuk 1994, 1998; Jacobs 1999). Consistently, these studies do report a positive correlation between objective measures of faculty productivity and departmental prestige, but the magnitude of this association is sometimes weaker than the Mertonian hypothesis might imply. For example, data reported in the most recent National Research Council (NRC) ranking of graduate sociology departments reveal that objective indicators of faculty publications, citations, and research grants *together* explain approximately 30 percent of the variance in prestige scores among sociology departments (Goldberger, Maher, and Flattau 1995). Incorporating other, more refined, measures of faculty productivity allows me to account for slightly more than half the variance in prestige scores among sociology departments. This is a considerable improvement, but it still leaves much of the variation in departmental prestige

[1] In this paper, the term "exchange" refers to indirect (generalized) exchange in which values circulate within or across a network, rather than direct (restricted) exchange in which values move back and forth between members of a dyad (Bearman 1997).

unexplained. By comparison, something as seemingly unrelated to "quality" is the number of faculty in a department *alone* accounts for roughly 35 percent of the variance in prestige scores among sociology departments. Similar associations between faculty size and departmental prestige are reported in earlier studies (Cartter 1966; Jones, Lindzey, and Coggeshall 1982). This pattern, which is not unique to sociology, has puzzled many who have pondered the meaning of departmental prestige rankings.

Also puzzling is the stability of departmental prestige rankings over long periods of time, despite the tremendous turnover of faculty, the intense competition for scholarly recognition, and the rise and fall of new theories and lines of research. In sociology, the top-ranked departments in the latest prestige ranking are, with but a few exceptions, virtually identical to those in the first such study done in 1925 (Table 1).[2] Overall, Keith and Babchuk (1994, 1998) demonstrate that the strongest predictor of current departmental prestige is past departmental prestige, even after controlling for faculty productivity. Moreover, the modest changes in departmental prestige rankings from one decade to the next are not explained by changes in faculty productivity (Baldi 1994; Keith and Babchuk 1998).

Finally, there is little evidence of any independent effect of the prestige of one's PhD-granting department upon productivity, either at the predoctoral stage or later in the academic career. The strongest predictors of postdoctoral productivity are predoctoral productivity (publications and/or citations) and how quickly candidates complete the doctorate. However, neither of these factors weighs heavily in the hiring decisions of academic departments compared with the importance given to the prestige of one's PhD-granting department (Clemente and Sturgis 1974; Long 1978; Long, Allison, and McGinnis 1979; Long and McGinnis 1981; McGinnis and Long 1988; Baldi 1995).

Various explanations have been advanced to account for these anomalies in the conventional view of departmental prestige. Some have suggested that the close association between departmental prestige and faculty size is because a well-rounded department needs to have a certain number of faculty members so that it can achieve prominence across the core subfields of a discipline (Hagstrom 1971). Others have argued that having a large faculty increases the visibility of a department, thereby introducing a distortion into the perceptions of those asked to rank the "quality" of departmental faculty, who easily confuse quality with quantity (Elton and Rodgers 1971; Elton and Rose 1972; Dolan 1976; Goldberger, Maher, and Flattau 1995). A variant of this argument is that the perception of departmental quality is influenced strongly by the presence of one or a few highly visible "stars" whose prominence eclipses the attention given to the average or cumulative productivi-

[2] These studies of departmental prestige differ in their details; however, all are based on a reputational method in which panels of experts or samples of disciplinary peers rate the scholarly "quality" of department faculty.

Table 1. Prestige Rankings of Sociology Departments, 1925–1993

Rank	1925	1934	1957	1964	1969	1981	1993
1	Chicago	Chicago[a]	Harvard	Berkeley	Berkeley	Chicago	Chicago
2	Columbia	Columbia[a]	Columbia	Harvard	Harvard	Wisconsin	Wisconsin
3	Wisconsin	Minnesota[a]	Chicago	Columbia	Chicago	Michigan	Berkeley
4	Minnesota	N. Carolina[a]	Michigan	Chicago	Michigan	Berkeley	Michigan
5	Michigan	Wisconsin[a]	Cornell	Michigan	Columbia	Harvard	UCLA
6	Harvard	—	Berkeley	Wisconsin	Wisconsin	N. Carolina	N. Carolina
7	—	—	Minnesota	Cornell	N. Carolina	Columbia	Harvard
8	—	—	N. Carolina	Princeton	UCLA	Stanford	Stanford

Note: Sources: Hughes (1925, 1934); Kenniston (1959); Cartter (1966); Roose and Anderson (1970); Jones, Lindzey, and Coggeshall (1982); Goldberger, Maher, and Flattau (1995). UCLA = University of California Los Angeles.

[a] Rated "distinguished" (departments listed alphabetically).

ty of the remaining faculty. Generally, large departments can be expected to have a greater number of stars, and so a department with 3 stars out of 30 faculty members may receive more recognition than a department with 2 stars out of 20 faculty members (Goldberger, Maher, and Flattau 1995).

Several factors have been cited to account for the stability of departmental prestige rankings over long time periods. The theory of cumulative advantage holds that the departments with the highest prestige will receive disproportionate access to resources required to perpetuate their status within the discipline (Merton 1968; Reskin 1977, 1979; Long 1978; Long, Allison, and McGinnis 1979; Long and McGinnis 1981; Allison, Long, and Krauze 1982; McGinnis and Long 1988; Keith and Babchuk 1994). Most commonly, this theory is framed in terms of differential access to resources required for scholarly productivity (research facilities, grants, release from teaching, etc.). As I have already noted, however, the ability of a department to maintain its prestige from one decade to another does not appear to depend on its productivity during the intervening period (Baldi 1994; Keith and Babchuk 1998).

Two additional factors have been proposed to explain the stability of departmental prestige rankings independently of variations in productivity. The first factor is the simple weight of tradition. Departments that achieved early recognition as centers of innovation and achievement within a discipline acquire an honorific status that persists despite later fluctuations in productivity (Keith and Babchuk 1994). Second, perceptions of departmental prestige are influenced by the eminence of the universities within which they are located. The eminence of a university is relatively unaffected by variations in the productivity of individual departments at any point in time, but reflects the cumulative accomplishments of numerous departments over a long historical period (Keith 1994). Hence, the eminence of a university (or lack thereof) creates a "halo effect" that bolsters the status of departments of modest achievement so long as they are located within prestigious universities, and that inhibits the recognition of highly productive departments if they are not located within distinguished universities (Keith and Babchuk 1998). Third, some have argued that the application of universalistic criteria in the assessment of academic quality is distorted by ascriptive biases. For example, Jacobs (1999) shows that academic departments that are located in universities with "State," "A&M," or regional designations ("North," "Southern") in their names, departments with a larger proportion of female graduate students, and departments in urban, public, largely commuter schools receive significantly lower prestige rankings net of any effects of productivity.

Although these arguments go a long way toward accounting for the anomalies in the conventional view of academic prestige, none of them challenges the premise that departmental prestige is, at root, a function of differences in scholarly achievement. At most, they point to measurement problems or biases that affect the perception of scholarly "quality" and, hence, the operationalization of the concept. I advance an alternative view that conceptualizes departmental prestige as primarily rooted in patterns of association and social exchange, and only secondarily in scholarly productivity.

THE CONCEPT OF SOCIAL CAPITAL

It is noteworthy that when sociologists have directed their attention to the functioning of status hierarchies within their own institutions, they have largely ignored the theoretical tools that have been developed by the discipline for making sense of these social processes—tools that have been applied successfully to a variety of other institutional spheres. The prevailing theory of social status, laid out by Weber (1968:926–40) more than 80 years ago, asserts that the reproduction of prestige hierarchies depends on (1) the adoption of a distinctive style of life by the members of a privileged status group, and (2) the closure of social intercourse between higher and lower status groups. Of these two factors, the latter is clearly determinant, since, as Weber (1968:936) emphasizes, the mere acquisition of the resources and training necessary to practice the style of life appropriate to the privileged status group is almost never sufficient to confer social honor upon the outsider or parvenu who is not already accepted within the exclusive circles formed by the closure of social intercourse.

Besides the differences in social honor that stratification by status entails, such stratification tends to be associated with differential access

to, or the monopolization of, material goods and opportunities of various kinds, including professional opportunities. It is for this reason that Weber (1968:937) depicts stratification by status as inherently antithetical to the free operation of the market, which "knows no personal distinctions" but is governed by impersonal calculations of utility and functionality. More generally, the formation of prestige hierarchies through social closure is inherently antithetical to the distribution of rewards or recognition on the basis of universalistic criteria of value or merit as, for example, envisioned in Merton's (1973) concept of the normative ethos of science.

Social closure reaches its most extreme form in the caste system, in which prohibitions on social intercourse between status groups acquire not just conventional or legal but ritual sanction. Weber (1968:934) comments that caste systems are exceptional not only for their high degree of social closure, but for their extraordinary success in securing the approval by lower castes of the social honor ascribed to higher castes. This is achieved by the strict distribution of occupational positions according to caste, which associates higher castes with functional roles that are deemed essential to the common goals of the larger society.[3]

Of the various forms of social closure that reproduce status hierarchy, none is more important than marital endogamy. But, even in the case of caste systems, Weber (1946:406) notes that exceptions can be made when the dominant caste's access to valued resources is at stake. For example, in the traditional Indian caste system, the maintenance of polygyny within the upper castes sanctioned the recruitment of brides from lower castes without any stigma being attached to the offspring of such unions. A strictly enforced norm of marital endogamy was also characteristic of the European nobility, but here, too, exceptions could be made for brides from newly enriched bourgeois families, especially during the period of the economic decline of the landed gentry in the late 19th and early 20th centuries (Toennies 1966; Cannadine 1990).[4]

Weber's insights into the essential link between the closure of social intercourse and the reproduction of status hierarchy have been applied and refined by generations of sociologists in a variety of social and institutional contexts. Particularly useful for the purposes of this study are the conceptual refinements advanced by Bourdieu (1986). Building on Weber's distinction between class and status group, and synthesizing these concepts with Marx's notion of capital as an accumulation of human labor that reproduces itself through its ability to appropriate additional labor, Bourdieu identifies three forms of "capital" that structure the distribution of power and opportunity in society. Economic capital corresponds most closely to Marx's notion as well as to Weber's concept of the productive assets and skills that govern the distribution of life chances derived from market exchange (i.e., class situation). Cultural capital and social capital correspond to the twin underpinnings that Weber cites as essential to the reproduction of status hierarchy. Cultural capital designates the cultivation of taste and the acquisition of cultural goods and skills needed to practice the specific style of life expected of members of a privileged status group. Social capital designates the "possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition"—that is, membership in a group—that increases in value in proportion to the exclusiveness of the group and the resources collectively under its control (Bourdieu 1986:248). The membership and boundaries of such groups are sometimes formalized by the assignment of a common name or title (e.g., family names or titles of nobility). Fundamentally, however, it is in and through the enactment of material and/or symbolic exchanges (of gifts, meals, salutations, marriage partners, etc.)—exchanges that both presuppose and reaffirm mutual acknowledgment

[3] Aspects of Weber's definition of caste, especially as applied to India, have been questioned by later scholars. Although there is general agreement with Weber's claims regarding social closure and occupational specialization, there is controversy over the importance of ritual and the acquiescence of lower castes (Klass 1980; Sharma 1999).

[4] Weaker, but still pronounced, norms of marital endogamy also characterize the upper social class within the United States (Warner 1960; Baltzell 1964).

and recognition—that the boundaries of the group are maintained.[5]

Like economic capital, cultural and social capital take time and labor to accumulate. They have the potential to yield "profits" and, thereby, to reproduce themselves and possibly expand. The distribution of these three forms of capital (and the rules by which one is changed into another) constitute what Bourdieu (1986:242) calls "the immanent structure of the social world," that is, the set of relatively durable constraints that enable or inhibit social action.

ACADEMIC PRESTIGE AS SOCIAL CAPITAL

Although it is common to speak of an academic "marketplace," most observers recognize that market forces play a restricted role within academia as compared with other professions. According to Smelser and Content (1980:6), "If the allocation of academic services is to be characterized in market terms, then surely the principal operative currency is prestige."[6] The implications of this observation, however, are seldom followed to their logical conclusion. If academic professionals are motivated mainly by the quest for prestige and academic institutions are ranked mainly in terms of prestige, then analogies to the market are likely to be of little use in explaining the structure and dynamics of academic employment. Rather, we must turn to theories of status hierarchy and, especially, to concepts of social closure and social capital, if we are to make sense of stratification among academic professionals.

Based on the insights of Weber and Bourdieu, I propose that academic prestige be conceptualized as a form of status honor that is reproduced through the closure of social exchange between higher and lower status groups and that can be measured by the magnitude of social capital possessed by individual academics or groups of academics. In the case of caste systems and similar status hierarchies, the exchange of marriage partners serves as the most important form of social exchange by which members of a privileged status group acknowledge one another, establish ties of reciprocity, and reaffirm the boundaries of the group. In the academic realm, I argue that the exchange of PhDs among departments functions as an analogous mechanism of affirming and reproducing status divisions. This is consistent with the evidence on academic hiring, which shows that the most prestigious departments hire almost exclusively from the graduates of similarly prestigious departments to an extent that exceeds anything that can be explained by the meritocratic application of universalistic standards regarding past or potential scholarly productivity (Caplow and McGee 1958; Berelson 1960; McGee 1960; Crane 1970; Gross 1970; Shichor 1970; Hargens and Farr 1973; Clemente and Sturgis 1974; Long 1978; Long, Allison, and McGinnis 1979; Reskin 1979; Long and McGinnis 1981; McGinnis and Long 1988; Baldi 1995).

One of the distinctive aspects of Bourdieu's concept of social capital is his notion of the fungibility of different forms of capital: Social capital, for example, can be exchanged with, transformed into, or used to acquire other forms of capital, including economic capital. This is consistent with Weber's observation that stratification by social status leads to the monopolization of material goods and opportunities. In the case of academic status hierarchies, the exchange of PhDs between departments can be viewed as a symbolic act of mutual affirmation, but it is also a process by which social capital is used to gain privileged access to economic capital (jobs for one's graduates), which, in turn, provides the foundation for further accumulation of social capital (in the form of an expanded network of institutionalized ties to persons employed within the discipline).

Although the most prestigious academic departments rarely hire PhDs from lesser ranked departments, the converse is not true. To hire the graduate of a middle-ranked department would undermine the principle of social exclusiveness

[5] Although Bourdieu is often credited with introducing "social capital" into the sociological lexicon, his explication of the concept is quite brief. For a fuller discussion, see Bourdieu and Wacquant (1992), Swartz (1997), Portes (1998), and Lin (2001).

[6] Even Caplow and McGee (1958:10), whose classic study is most often associated with the notion of an academic "marketplace," admit in their introduction that, although it was not their original intent, they were forced by the findings of their research to make prestige a central variable in the book. Consequently, the index of *The Academic Marketplace* includes 33 separate entries under "prestige" and none under "markets."

that guarantees the status honor of the most prestigious departments. There is no such stigma, however, associated with placing one's PhDs in lesser-ranked departments. Indeed, top-ranked departments compete for this honor, even while they cooperate in filling their own vacancies with PhDs recruited from other top-ranked departments. This situation is analogous to that of the Indian caste system described by Weber (1946:406). In that caste system, the rules of marital endogamy sanctioned the recruitment of brides from lower castes (a practice that facilitated polygyny and male reproductive success) but not bridegrooms (which jeopardized the purity of the caste).

Because the economic capital on which academic employment depends is distributed widely among institutions, the elite departments can expand their social capital only by colonizing faculty positions in less prestigious departments.[7] Lesser-ranked departments are generally eager to exchange their economic capital (faculty positions and salaries) for the increment in prestige they hope to gain by hiring the graduate of a highly ranked department (or, what is the same thing, by establishing an institutional link with a department that already commands extensive social capital). From the standpoint of the entire system, however, the cumulative result of these unequal exchanges is merely to reproduce the status differential (i.e., the unequal distribution of social capital) between more prestigious and less prestigious departments, since the graduates of more prestigious departments will tend to monopolize employment not only in elite departments but across the discipline. Hence, it is possible to speak of a process of cumulative advantage in academic prestige hierarchies that operates purely through the self-reproducing capacity of social capital.

In addition to their advantage in securing employment for their graduates (and thereby reproducing their social capital), departments that possess an extensive network of institutional connections to other faculty and departments, accumulated over many years of hiring and placing PhDs, reap additional advantages as well. Such extended networks are instrumental in securing the formal or informal nominations, endorsements, and recommendations that facilitate the acquisition of tokens of honor and recognition within the discipline: publication by the most prestigious journals and presses, office in professional associations, membership in learned societies, invited lectures, honorary degrees, and so on. Furthermore, because judgments of academic prestige always are to some extent self-referential, the larger a department's extended "kinship" network, the greater the number of faculty within the discipline whose own status claims will be tied to affirming the prestige of that department.[8]

Does this mean that scholarly productivity is irrelevant to the reproduction of academic status hierarchies? Certainly not. There is nothing in the preceding argument that contradicts the notion that most academic hiring decisions are at least broadly consistent with meritocratic principles. The important point, however, is that even the most rigorous application of meritocratic principles in academic hiring still leaves significant room for choice and inevitably calls for subjective judgments of scholarly quality or potential. The number of reasonably qualified applicants typically exceeds the number of job openings in the more prestigious departments. Moreover, the criteria by which applicants are judged are neither fixed nor universally agreed upon, but necessarily entail an element of academic taste or fashion, where the fashions currently in vogue are almost certain to be those initiated or promoted by the more prestigious departments.

[7] This has not always been the case. In the early 20th century, research grants (especially grants from Rockefeller family foundations) provided much of the economic capital for building sociology departments (Bulmer 1984; Harvey 1987; Turner and Turner 1990). In that era, social ties to wealthy foundations were the most crucial form of social capital and the main source of prestige within the discipline. Departmental inbreeding was common, as elite departments used such grants to create jobs for their own graduates. Only later did undergraduate demand for sociology courses (and, hence, salaries for faculty to teach those courses) become the chief source of economic capital for the discipline.

[8] Caplow and McGee (1958) refer to this as the "aggrandizement effect" and present compelling evidence of the extent to which faculty inflate the prestige of the departments with which they are connected when compared with the judgments made by other faculty.

Standards of scholarly accomplishment in elite departments perhaps are viewed best as an instance of Weber's thesis that the reproduction of status inequality requires the display of a distinctive style of life by the members of a privileged status group. Faculty members in prestigious departments are expected to possess sufficient human and cultural capital to demonstrate virtuosity in those fields of performance that define the academic life: research, publishing, and lecturing, for example. Being groomed for this role, and being provided with extensive resources and inducements to perform to these expectations, most faculty members in elite departments do, in fact, display a level of scholarly accomplishment that is roughly commensurate with their social status. At the same time, many faculty in less prestigious departments also strive to emulate the scholarly virtuosity that faculty in elite departments are called upon to display; and some (both as individuals and as departments) are, by any objective standard, at least as proficient in this endeavor as the faculty of more prestigious departments. Like the parvenu discussed by Weber (1968:936), however, their mastery of the behavioral repertoire of the privileged status group may be insufficient to secure social honor for these departments if they lack the proper pedigree and social connections.

THE STRUCTURE OF THE PHD EXCHANGE NETWORK

The concept of social capital designates the position of individuals or groups within *networks* of association and social exchange. The measurement of social capital therefore requires data on the overall network of social connections among the persons or groups that are the focus of analysis. As defined in this study, the social capital of an academic department is a function of the number and pattern of institutional links created through the exchange of PhDs among departments. In this section and the ones that follow, I employ network analysis to construct such a measure of social capital and employ it to evaluate the empirical adequacy of my thesis regarding the relationship between social capital and departmental prestige. The discipline of sociology serves as my primary case for this analysis. Comparable data on two other academic disciplines (history and political science) are marshaled to assess the generalizability of the findings based on the field of sociology.

To construct a model of the PhD exchange network in sociology I consulted the American Sociological Association's *Guide to Graduate Departments of Sociology* (1995) for information on the institution where each full-time faculty member at a PhD-granting department received his or her own PhD. Emeritus faculty and those holding joint appointments with other departments were excluded from the tally. Included in the study were all but one of the 95 sociology departments that were ranked in the National Research Council's latest survey of departmental prestige (Goldberger, Maher, and Flattau 1995). One PhD-granting institution, the Graduate Center of the City University of New York (CUNY), was omitted from the analysis because of its unconventional organizational structure and ambiguity in demarcating which faculty should or should not be counted within the program.[9] With these data I constructed a 94 x 94 matrix of all PhD-granting departments in sociology with entries showing how many PhDs each department hired from each of the others and, conversely, how many PhDs they placed with each of the others.

Table 2 distills some of the basic patterns that are revealed by this hiring matrix. Shown here are the 94 PhD-granting sociology departments, ranked according to the number of their PhDs who occupy faculty positions within any of the departments in the matrix.[10] Even for those familiar with the hierarchical nature of academic employment, the results shown in Table 2 are striking. Graduates from the top 5 departments account for roughly one-third of all faculty hired in all 94 departments. The top 20 departments account for roughly 70 percent of the total. Boundaries to upward mobility are extremely rigid. Sociologists with degrees from

[9] The Graduate Center operates with a small core of six to eight full-time faculty but also incorporates, in varying capacities, scores of affiliated faculty from other campuses within the CUNY system. Different sources report widely different figures on which and how many faculty members actively are involved in the PhD program.

[10] Hanneman (2001) reports similar findings based on an earlier year and using a slightly less restrictive way of enumerating departmental faculty.

Table 2. Sociology Departments Ranked by Number of Graduates Employed in All 94 PhD-Granting Departments

PhD-Granting Department	Rank	PhDs Hired in All 94	PhDs Hired in Top 20	PhDs Hired in Top 5
Top 5				
Wisconsin	1	122	40	15
Chicago	2	111	41	13
Michigan	3	105	35	21
UC Berkeley	4	105	34	12
Harvard	5	102	50	15
Total from top 5		545	200	76
Percent from top 5		32%	48%	56%
Remaining Top 20				
Columbia	6	64	18	3
Stanford	7	58	26	12
North Carolina	8	57	18	2
Indiana	9	48	9	1
Washington	10	46	16	5
Yale	11	45	18	3
Texas	12	43	5	2
Pennsylvania	13	41	11	3
Northwestern	14	39	10	1
Cornell	15	37	9	5
Princeton	16	33	19	7
Minnesota	17	32	6	1
Ohio State	18	31	1	0
Duke	19	26	7	2
Johns Hopkins	20	26	6	1
Total from top 20		1171	379	124
Percent from top 20		69%	88%	91%
Non-top 20				
UCLA	21	25	7	1
Pennsylvania State	22	25	2	1
Brown	23	22	4	0
SUNY Stony Brook	24	19	3	1
New York University	25	19	2	2
Iowa	26	18	2	0
Arizona	27	17	6	0
Massachusetts	28	17	1	0
Michigan State	29	16	3	1
Brandeis	30	15	1	1
UC Santa Barbara	31	15	1	0
Kentucky	32	15	0	0
Washington State	33	14	0	0
Oregon	34	13	0	0
Kansas	35	13	0	0
Florida State	36	12	1	0
Iowa State	37	12	0	0
Illinois	38	11	1	0
Purdue	39	11	0	0
Colorado	40	11	0	0
Vanderbilt	41	10	4	0
Nebraska	42	10	0	0
Tennessee	43	9	1	1
Boston University	44	9	1	0
SUNY Albany	45	8	3	1

(continued on next page)

Table 2. *(Continued).*

PhD-Granting Department	Rank	PhDs Hired in All 94	PhDs Hired in Top 20	PhDs Hired in Top 5
UC San Diego	46	8	1	1
Missouri	47	8	1	1
University of Southern California	48	8	1	0
UC Santa Cruz	49	7	1	1
Connecticut	50	7	1	0
Florida	51	7	0	0
UC Riverside	52	7	0	0
Utah	53	7	0	0
Rutgers	54	6	0	0
Virginia	55	6	0	0
Georgia	56	6	0	0
SUNY Binghamton	57	5	1	0
Temple	58	5	1	0
Syracuse	59	5	0	0
SUNY Buffalo	60	5	0	0
Notre Dame	61	4	1	0
Maryland	62	4	0	0
UC San Francisco	63	4	0	0
Pittsburgh	64	4	0	0
Tulane	65	4	0	0
Southern Illinois	66	4	0	0
Illinois Chicago	67	3	0	0
Texas A & M	68	3	0	0
Louisiana State	69	3	0	0
Northeastern	70	3	0	0
Cincinnati	71	3	0	0
Oklahoma State	72	3	0	0
Boston College	73	2	0	0
New Hampshire	74	2	0	0
Bowling Green	75	2	0	0
Colorado State	76	2	0	0
Western Michigan	77	2	0	0
Denver	78	2	0	0
Utah State	79	2	0	0
Hawaii	80	1	0	0
North Carolina State	81	1	0	0
Loyola Chicago	82	1	0	0
Delaware	83	1	0	0
Arizona State	84	1	0	0
Howard	85	1	0	0
Fordham	86	1	0	0
Akron	87	1	0	0
Mississippi State	88	1	0	0
Oklahoma	89	1	0	0
American University	90	0	0	0
Kent State	91	0	0	0
NorthTexas	92	0	0	0
Catholic University	93	0	0	0
Georgia State	94	0	0	0
Total from non-top 20		529	51	12
Percent from non-top 20		31%	12%	9%
All 94		1700	430	136

non-top 20 departments are rarely hired at top 20 departments and almost never hired at top 5 departments.

With simple arithmetic, data for the three tiers of departments shown in Table 2 can be collapsed into the familiar format of a 3 x 3 mobility table indicating origin and destination categories for each sociology PhD (Table 3). In this mobility table only 6 percent of faculty are below the diagonal (upward mobility), 40 percent are along the diagonal (horizontal mobility), and 54 percent are above the diagonal (downward mobility). This information confirms the observation made by Berelson (1960:114) and supported by later studies (Gross 1970; Shichor 1970; Cole and Cole 1973; Burke 1988; Baldi 1994) that mobility in academia is mainly horizontal or downward and seldom upward.

A closer examination of the individual cells in Table 3 allows us to pinpoint areas of greater or lesser social closure and/or mobility. To facilitate this examination I have calculated the deviations of the observed from the expected frequencies (assuming randomness) for each cell in the table. The cells designated with superscript 'a' are those in which the observed frequency departs from the expected frequency by ±50 percent or more, while cells designated with superscript 'b' are ones in which the deviation is ±20 percent or more.[11] Note that the highest level of endogamy is found among PhDs exchanged among the top 5 departments (upper-left cell), whereas the strongest barrier of social exclusion is found in the low percentage of PhDs from non-top 20 departments hired in top 20 departments (lower-left and lower-center cells). Otherwise, there are moderately high levels of endogamy along the remaining cells of the diagonal and moderately high levels of downward mobility of PhDs from top 5 depart-

[11] The magnitude of cell residuals is not the same thing as their statistical significance. Following the method outlined by Reynolds (1977:11–12), I calculated z-scores for the adjusted residuals of each cell. All of the residuals except those of the center-left and center-right cells are significant at the $p < 0.001$ level.

Table 3. Mobility Table Showing Origins and Destinations of Sociology PhDs among Three Tiers of Departments

	Department of Employment			
Ph.D-Granting Department	Top 5	Next 15	Other 74	Total
Top 5 Departments				
Raw N	76[a]	124[b]	345	545
Percent	4.5	7.3	20.3	32.1
Ratio	1.73	1.32	.85	—
Next 15 Departments				
Raw N	48	131[b]	447	626
Percent	2.8	7.7	26.3	36.8
Ratio	.96	1.22	.96	—
Other 74 Departments				
Raw N	12[a]	39[a]	478[b]	529
Percent	.7	2.3	28.1	31.1
Ratio	.29	.43	1.21	—
All Departments				
Raw N	136	294	1270	1700
Percent	8.0	17.3	74.7	100.0
Ratio	—	—	—	—

Note: Raw N = raw number of PhDs; Percent = % of the entire population; Ratio = ratio of the actual number of PhDs to the expected number assuming randomness (i.e., row marginal times column marginal divided by total N). Departments are ranked according to the number of graduates employed in all 94 PhD-granting departments (see Table 2).

[a] Observed frequency departs from expected frequency by ≥ 50 percent.

[b] Observed frequency departs from expected frequency by ≥ 20 percent.

ments to the remaining departments of the top 20 (upper-center cell). Interestingly, the percentage of faculty employed in top 5 departments who received their PhDs from the remaining 15 of the top 20 (center-left cell) does not depart noticeably from randomness, indicating that barriers to mobility between these two tiers are relatively weak compared with barriers to mobility into the top 20 from non-top 20 departments.[12] Further, so long as we restrict our population to PhD-granting departments, graduates of top 20 programs are not markedly overrepresented among faculty hired at non-top 20 departments (upper-right and center-right cells). Of course, this abstracts away from the large number of PhDs who are employed in non-PhD-granting departments—a pattern that we can assume removes a disproportionate number of graduates of non-top 20 departments from the population under study. Hence, it is possible (indeed likely) that graduates of top 20 departments are highly advantaged with respect to their prospects for employment in non-top 20 departments, but that, relative to the subpopulation of PhDs who secure employment in PhD-granting departments, their numbers remain commensurate with the expected frequencies, given the marginal distribution of PhDs exchanged among these three tiers of departments.

Two facts about the data in tables 2 and 3 should be emphasized. First, the predominance of graduates from the top 5 or top 20 departments among the faculties of all PhD-granting programs is not simply a reflection of the greater output of PhDs by the top departments. There was a time when most sociology PhDs were produced by a handful of elite departments (National Research Council 1963; Sibley 1963), but this has not been true since the 1960s. Using data from Jones, Lindzey, and Coggeshall (1982) and Goldberger, Maher, and Flattau (1995), I estimate that the top 5 departments in Table 2 were responsible for 14 percent of sociology PhDs awarded between 1975 and 1992, and that the top 20 departments were responsible for 35 percent.[13] These estimates are smaller by several magnitudes than the percentages in Table 2 indicating the dominance of these programs over employment across the discipline.

Second, it should be emphasized that these data refer to not just new PhDs but to faculty at *all* stages of their careers. Most of the research on the impact of departmental prestige on academic hiring has focused on the origins and destinations of new PhDs at the time of their first academic employment. This research shows clearly that the prestige of one's PhD-granting department is the single most important factor in faculty hiring at this early stage of the career, but it also leaves open the possibility that hiring at more advanced levels might place less importance on departmental pedigree and more importance on demonstrated achievement (Gross 1970). If this were the case, one could plausibly argue that the reliance on departmental prestige in the hiring of new PhDs is simply a reaction to the dearth of reliable evidence on scholarly potential at this early stage of the career. This would be consistent with research on the role of organizational status in the functioning of more conventional economic markets, which shows that the attention given to the status of the producing organization is contingent on the degree of uncertainty surrounding the

[12] As early as 1970, it has been common to speak of the "top 20" as designating the elite departments within sociology (Gross 1970). Although this may seem an arbitrary cut-off point, the patterns of closure and mobility in Table 3 confirm the meaningfulness of this classification. To explore this issue further, I conducted an inductive analysis of closure and mobility within the hiring network using Borgatti and Everett's (1999) core-periphery algorithm. Consistent with the conventional typology, the results show that the most salient dichotomization of the discipline judged by the exchange of PhDs is one that places 19 of the top 20 departments in the "core" category and the remaining 75 departments in the "periphery."

[13] Jones, Lindzey, and Coggeshall (1982) provide data on the total number of PhDs produced by each department between 1975–1976 and 1979–1980. Goldberger, Maher, and Flattau (1995) provide data on the total number of PhDs produced by each department between 1987–1988 and 1991–1992. The percentages of the total number of sociology PhDs awarded by the top 5 and top 20 departments were virtually identical in each of these five-year periods. I have therefore taken these percentages as an estimate for the entire 1975–1992 period.

quality of the product being exchanged (Podolny 1993, 1994, 2001).

My data show that this explanation is insufficient to account for the caste-like nature of hiring networks within sociology. The prestige of one's PhD-granting department is no less important in circumscribing the jobs open to those hired at a senior level (when more objective evidence of scholarly ability is typically available) than it is in the hiring of newly minted PhDs. In this respect, the current situation appears little changed from that encountered over 40 years ago by Caplow and McGee (1958:225), who concluded that the initial choice of a graduate school sets an "indelible mark" on a student's career that is unlikely to be overcome by the postgraduate achievements of even the most brilliant scholar. In fact, my data suggest that the hiring of senior faculty by prestigious departments is even *more* incestuous than the hiring of new PhDs. While the recent graduate of a lower ranked department may bear the stigma of his or her PhD-granting department, those who are employed in similar departments for a period of years also bear the stigma of the departments in which they are employed. Of the 430 full-time faculty employed by the top 20 sociology departments shown in Table 2, only 7 (less than 2 percent) received their PhD from a non-top 20 department, worked for three or more years in a non-top 20 department, and, after building their scholarly reputations, advanced to a faculty position in one of the top 20 departments.[14] The more common pattern among the lucky few who have been able to parlay a PhD from a non-top 20 department into a job at a top 20 department is that they achieved this at the time of their first job—often with the aid of a postdoctoral fellowship from a prestigious department or an accompanying bachelor's or master's degree from an elite university.

[14] Even this figure exaggerates the extent of upward mobility in senior hires, since 3 of these 7 received their PhDs from one of the 5 departments immediately below the top 20, and 2 of these 3 advanced only as high as the bottom quartile of the top 20.

THE MEASUREMENT OF SOCIAL CAPITAL

Having surveyed the general pattern of hiring among sociology departments, I now turn to the task of operationalizing social capital and investigating its relationship to departmental prestige. Bourdieu (1986:249) says that the volume of social capital is a function of two things: (1) the number of social connections possessed by a given agent; and (2) and the amount of social (and other) capital held by those with whom connections are maintained. Based on this definition, an appropriate measure of the social capital of department i is therefore one that takes into account the total number of links maintained by department i, where each link is then weighted by a function of the number and type of links maintained by the other departments $j_1 \ldots j_n$ to which department i is connected. We can express the same thing by noting that the social capital of any one department can only be accurately measured when we also know the social capital possessed by other departments, since, according to Bourdieu's theory, not all social connections are of equal value. Ties to another department that, in turn, commands extensive social capital are of greater value than ties to a department that has few important social connections. In general terms, we can therefore represent the social capital of department i, (denoted by c_i) by the expression

$$c_i = a_{i1}c_1 + a_{i2}c_2 + a_{i3}c_3 + \ldots + a_{in}c_n = \sum_j a_{ij}c_j, \quad (1)$$

where a_{ij} is the number of ties that department i has with department j, c_j is the social capital possessed by department j, and a_{ii} is set equal to zero (since ties to oneself do not constitute social capital).

The problem of calculating the prominence or centrality of actors within a network, where each actor's score is simultaneously a function of the scores of all other members of the network, is a common one in social network analysis, and there are a number of approaches to its solution. We can conceive of the problem as one of solving n simultaneous linear equations for n unknowns, where formula (1) provides us with one equation for each actor in the network. Or we can conceive of the problem as one

of the convergence of an infinite sequence, where we begin by simply counting the number of ties maintained by each actor as a measure of his or her prominence; then calculate a more refined, second-order measure by weighting each of ego's ties by the corresponding prominence score of each alter derived from the first round; then calculate a third-order measure based on the weights derived from the second round; and so forth ad infinitum. Or we can conceive of the matrix of ties between each dyad of actors as measures of association, analogous to a correlation matrix, and then apply factor analysis to derive the first principle component as an estimate of the overall tendency of each actor to form associations with other actors in the network.

Fortunately, we do not have to choose between these competing approaches, since Bonacich (1972), in an elegant application of matrix algebra, demonstrates that all three approaches converge on a common solution, henceforth referred to as Bonacich's eigenvector centrality measure. Bonacich's measure is defined as follows. Given an adjacency matrix A_{ij} denoting the links or relations between all pairs of actors i and j, the centrality of actor i (again denoted c_i) is given by the expression:

$$c_i = \alpha \sum_j A_{ij} c_j, \qquad (2)$$

where α is the reciprocal of the largest positive eigenvalue and where the centralities $c_1 \ldots c_n$ are therefore the elements of the corresponding eigenvector. Note that formula (2) is equivalent to formula (1) except for the addition of parameter α, which is required to give the equation a nontrivial solution. Eigenvector centrality is the most widely used of a class of similar measures—variously referred to as status, power, prominence, or prestige—that have been developed for analyzing centrality within exchange or communication networks (Katz 1953; Hubbell 1965; Bonacich 1972, 1987; Knoke and Burt 1983; Wasserman and Faust 1994).

Implicit in the choice of Bonacich's eigenvector centrality index to operationalize social capital are three measurement decisions that deserve comment. The first concerns the question of the relative weight to be given to ties formed by placing one's PhDs in another department versus ties formed by hiring PhDs from another department. Bourdieu's discussion of social capital eludes this question by implicitly assuming that all social ties are reciprocal; whereas Weber more accurately recognizes that exchange within and between levels of a status hierarchy is sometimes directional in nature. My guess would be that differential success in the *placement* of PhDs plays a somewhat greater role in determining the status-ranking of elite departments relative to one another, whereas differential success in *hiring* PhDs from well-connected (i.e., prestigious) departments plays a greater role in determining the status-ranking among non-elite departments (with the placement and hiring of PhDs having more equal weight in the status ranking of second-tier or quasi-elite departments). At all levels of the status hierarchy, however, both placement and hiring of PhDs contribute to aggregate social capital and should, therefore, have consequences for relative prestige. Alternative measures exist that allow separate centralities to be calculated for either of these two types of interdepartmental ties—that is, separate centrality scores can be calculated for the rows and columns of an asymmetrical matrix (Knoke and Burt 1983; Wasserman and Faust 1994). Since I have no compelling theoretical grounds, however, for assigning different weights to these two types of interdepartmental ties, I shall treat them equivalently. This is done by summing the number of PhDs hired by department i from department j with the number of PhDs hired by department j from department i to yield a symmetrical matrix A_{ij} denoting the total number PhDs exchanged between departments i and j.

After the attention given in the previous section to the association between departmental prestige and the number of PhD placements, it might appear more appropriate to calculate network centrality exclusively on the basis of placements, where the number of each department's PhDs hired by other departments is conceived as a form of sociometric choice or preference data.[15] This is the more typical approach in network studies of prominence or prestige (Knoke and Burt 1983). However, the important point to emphasize is that the ties created through

[15] This is the approach followed by Hanneman (2001) in what, to my knowledge, is the only other study that uses network concepts to analyze departmental prestige.

the exchange of PhDs are conceptualized in this study, not simply as sociometric indicators of preference, but as objective social *relations*. This can be confusing, since prestige is usually perceived as a product of choices, preferences, or nominations. This is how we assess prestige in reputational surveys like the NRC study. Moreover, status-conscious choices (both on the part of departments in deciding from whom to hire and on the part of individual PhDs in deciding from whom to accept faculty appointments) are instrumental in reproducing the prestige hierarchy. However, my thesis is that, behind these status conscious choices (or, better, as the self-reproducing, social-structural foundation of these status conscious choices), an objective structure of social relations exists among departments, which is captured by the concept of social capital. The accumulated social capital of each department is understood as the accretion of years of both hiring from certain types of departments and years of placing its PhDs in certain types of departments, though the distribution of social capital between these two sources of social ties will necessarily vary for departments at different levels of the prestige hierarchy.

The second measurement issue concerns the relative weight to be given to direct versus indirect social ties. Bourdieu explicitly states that indirect social ties are part of the calculus of social capital. What matters is not simply with which and how many alters each ego has a direct social tie, but which and how many other actors are indirectly accessed through that social tie. Nevertheless, it is plausible to assume that the number and character of one's proximate ties are more important in defining social capital than ties that are several links removed. There are alternative measures of network centrality that allow one to attenuate the weight given to more distant ties in assessing the value of proximate ties (Bonacich 1987). Since I have no clear theoretical rationale for specifying such an attenuation factor, however, I shall simply weight each social tie possessed by department i by the full measure of the centrality score of each department $j_1 \ldots j_n$ to which department i is connected.

The third measurement issue concerns the appropriate manner of dealing with departmental inbreeding—that is, departments that hire their own PhDs. Previous research suggests that departmental inbreeding is more prevalent among elite departments (McGee 1960; Hargens and Farr 1973)—a hypothesis that is confirmed by the data assembled for this study.[16] Hence, including such ties in the calculation of centrality scores should boost the scores of the more prestigious departments. Nevertheless, the diagonal of the matrix will be set to zero, since social capital is logically a function of links to *other* departments and should not be affected by links within a department created by hiring one's own PhDs.[17]

Bonacich's eigenvector centrality measure was implemented using the UCINET network analysis software program (Borgatti, Everett, and Freeman 1999). The first positive eigenvalue is three times the size of the next largest, which bodes well for the robustness of the measure and provides evidence of a single encompassing prestige hierarchy within sociology, rather than several relatively separate cliques or component hierarchies. No discernable pattern could be identified among the scores on the second and third largest eigenvectors—as we might expect to find, for example, if there were pronounced regional segmentation within the PhD exchange network or separate exchange networks among private and public universities. Eigenvector centrality scores were highly

[16] The correlation between departmental prestige and the number of inbred hires is 0.350 ($p < 0.001$); however, departmental inbreeding is now relatively rare, accounting for only 4 percent of faculty in PhD-granting departments of sociology.

[17] I favor Bonacich's eigenvector centrality index because of its close correspondence with Bourdieu's definition of social capital, but, as is often the case in social network analysis, alternative measures of network centrality are highly correlated. Hence the three measurement decisions outlined earlier have only a modest impact on the results of the analysis. I computed (1) an alternative eigenvector index (Knoke and Burt 1983) that measures prominence exclusively in terms of PhD placements rather than jointly in terms of placements and hires; (2) a range of alternative measures (Bonacich 1987) that apply varying degrees of attenuation to the weight given more distant ties; and (3) an alternative measure of centrality that does not exclude inbred hires from the matrix. All of these have a correlation of 0.9 or higher with the preferred Bonacich eigenvector measure.

skewed and, therefore, a logarithmic transformation was applied to the raw centrality scores.

THE RELATIONSHIP BETWEEN SOCIAL CAPITAL AND DEPARTMENTAL PRESTIGE

Table 4 reports the coefficients for a series of regression models used to estimate the prestige ratings of graduate departments of sociology reported in the NRC's most recent survey of departmental prestige (Goldberger, Maher, and Flattau 1995). The dependent variable, departmental prestige, is based on ratings by disciplinary peers of the "scholarly quality of program faculty" on a five-point scale ranging from "distinguished" to "marginal." Besides social capital, the independent variables are measured as follows. Three indicators of scholarly productivity are taken from the NRC study.

- *Article publications* are measured by the average number of journal articles per faculty member in the five years preceding the NRC study, based on data from the Institute of Scientific Information, producers of the *Social Science Citation Index*.
- *Citations* are measured by the average number of citations per faculty member in the five years preceding the NRC study, also based on data from the Institute of Scientific Information.
- *Research grants* are measured by the percentage of faculty receiving support from research grants in the seven years preceding the NRC study, based on data from federal agencies.

Keith and Babchuk (1998) propose two more refined measures of scholarly productivity. I include these in the analysis to ensure that every effort is made to capture the effects of productivity on departmental prestige.

- *Weighted article publications* is an index based on the number of articles per faculty member published in any of seven top sociology journals between 1980 and 1989, where each article is weighted by an "impact score" (Allen 1990) reflecting the average frequency of citation of the journal in which the article appears. This measure gives particularly heavy weight to articles published in either of the two "flagship" journals of the discipline, *American Sociological Review* and *American Journal of Sociology*, and considerably lesser weight to articles published in *Social Forces*, *Social*

Table 4. Unstandardized Coefficients from the Regression of Departmental Prestige on Selected Characteristics of Graduate Departments of Sociology

Independent Variable	Model 1 (OLS)	Model 2 (OLS)	Model 3 (OLS)	Model 4 (OLS)	Model 5 (IV)
Social Capital	—	—	1.359***	1.118***	1.259***
	—	—	(.061)	(.069)	(.097)
Article Publications	.040	.026	—	.072	.078
	(.124)	(.101)	—	(.051)	(.052)
Citations	.059*	.026	—	.005	.002
	(.023)	(.020)	—	(.010)	(.011)
Research Grants	.022**	.001	—	.000	–.001
	(.007)	(.006)	—	(.003)	(.003)
Weighted Article Publications	—	.743***	—	.180*	.108
	—	(.147)	—	(.082)	(.090)
Book Publications	—	.481**	—	.245**	.215*
	—	(.177)	—	(.090)	(.093)
Constant	1.821	1.532	–.469	–.401	–.645
Multiple R	.555	.747	.918	.943	.940
Adjusted R^2	.285	.532	.842	.882	.877

Note: Numbers in parentheses are standard errors; N = 94 academic departments. OLS = ordinary least squares; IV = instrumental variable.
* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests)

Problems, *Demography*, *Sociology of Education*, and *Sociological Quarterly*.[18]

- *Book publications* are measured by the average number of books per faculty member that were reviewed in *Contemporary Sociology* between 1980 and 1989.

Finally, I include a measure of faculty size—a variable that is associated with social capital and assumed to be exogenous with respect to departmental prestige. This variable will be used as an instrument for constructing an alternative measure of social capital that is free of the potential problems of simultaneity in the relationship between social capital and departmental prestige.

- *Faculty size* is measured as the total number of departmental faculty reported in the NRC study. A log transformation was applied to correct for skewness.[19]

Correlations, means, and standard deviations of all variables employed in the analysis are presented in Appendix A.

The first model in Table 4 uses ordinary least squares (OLS) regression to estimate departmental prestige in terms of the three objective measures of scholarly productivity reported in the NRC study: article publications, citations, and research grants. Together these measures account for roughly 30 percent of the variance in departmental prestige. Hence, there is evidence of a positive association between faculty productivity and departmental prestige. More than 70 percent of the variation in departmental prestige, however, remains unexplained by these three productivity measures.

The second model adds Keith and Babchuk's (1998) more refined measures of scholarly productivity: weighted article publications and book publications. With the inclusion of these variables, scholarly productivity explains slightly more than half the variance in departmental prestige. The superiority of the weighted article publications measure (which emphasizes publication in *ASR* and *AJS*) over both the total number of articles published and the total citation rate is noteworthy. This can be taken as an indication that departmental prestige depends more on the "quality" than the quantity of publications. On the other hand, there is also evidence that the more prestigious journals, being controlled by the more prestigious departments, are more accepting of articles written by faculty and graduates of those departments (Crane 1967; Shamblin 1970; Keith and Babchuk 1994).[20] Whatever the case regarding academic journals, there is general agreement in the literature that article publication, because of the practice of blind review, is more openly competitive than book publication, where institutional affiliation, scholarly reputation, and name recognition play a larger role in publication decisions (Coser, Kadushin, and Powell 1982; Powell 1985; Clemens et al. 1996, Keith and Babchuk 1998). It is therefore possible that processes of cumulative advantage are partly responsible for the association between book publications and departmental prestige. Nevertheless, even using these more prestige-sensitive measures of productivity, almost half the variation in departmental prestige remains unexplained in this model.[21]

The third model estimates departmental prestige in terms of social capital alone. This one variable accounts for 84 percent of the variance in departmental prestige. This provides compelling support for the thesis that departmental prestige is strongly influenced by the

[18] Keith and Babchuk (1998) report that a simple two-journal index that counts only articles in *ASR* and *AJS* yields a measure that is essentially identical to their more elaborate seven journal index. The two measures have a correlation of about 0.95.

[19] A slightly different measure of faculty size is reported in the American Sociological Association's *Guide to Graduate Departments of Sociology* (1995). The two measures have a correlation of .85 ($p < 0.001$), and the choice of one measure over the other has little effect on the analysis.

[20] For example, Keith and Babchuk (1994:16) show that 9 of the 12 departments that housed the *American Sociological Review* between 1949 and 1989 experienced noticeable gains in their frequency of publication in *ASR* during the time of their editorship compared with the preceding five-year period.

[21] A more parsimonious model that omits all three NRC measures of scholarly productivity explains roughly the same amount of variance in departmental prestige. Hence, of the various forms of scholarly productivity, it is particularly the publication of books and/or articles in the top-ranked journals that are correlated with departmental prestige. Scholarly research that does not find an outlet in one of these venues has relatively little independent effect on departmental prestige.

location of departments within disciplinary networks of association and social exchange.[22] More than this, I would submit that when two variables that are measured entirely independently of one another are correlated at a level that exceeds 0.9 (as with social capital and departmental prestige), this suggests the likelihood of some kind of feedback process through which, over time, the two variables are kept closely aligned. This is precisely what is implied by the notion that departmental prestige reproduces itself through a process of cumulative advantage in the maintenance and accumulation of social capital.

The fourth model includes social capital together with the five measures of scholarly productivity from Model 2. The productivity measures add relatively little (roughly 4 percent) to the explained variance over and above what is accounted for by social capital alone. Moreover, the standardized regression coefficient (beta weight) for social capital is 5.6 times as large as the coefficient for the next strongest predictor of departmental prestige (book publications). This, again, is consistent with the thesis that departmental prestige is primarily rooted in networks of association and social exchange, and only secondarily in differences among departments in scholarly productivity.

The fifth model is intended as a check against the possibility that the OLS estimators may be inconsistent or biased on account of the recursivity in the relation between social capital and departmental prestige—that is, that they suffer from simultaneity bias. Earlier I argued that social capital can be understood as the social-structural foundation of departmental prestige, but I also argued that social capital is reproduced or accumulated through hiring decisions that favor the employment of PhDs from already prestigious departments. This implies some degree of feedback whereby social actions influenced by perceptions of departmental prestige serve to reproduce the unequal distribution of social capital. Within the framework of OLS regression, recursive relationships of this kind can lead to inconsistent parameter estimates because the explanatory variable that is subject to such feedback will not be independent of the disturbance in the equation.

Instrumental variable estimation is a common method for dealing with bias and inconsistency induced by a correlation between an independent variable and the disturbance (Davidson and MacKinnon 1993; Greene 1993).[23] In our case, instrumental variable estimation calls for another variable that is correlated with social capital but uncorrelated with the disturbance. More specifically, we require a variable that can theoretically be claimed to have no *direct* causal impact on departmental prestige (i.e., any impact must be mediated by other variables in the equation) and that is not itself recursively caused by departmental prestige. Here I propose faculty size as such a variable. From the standpoint of the theory advanced here, the number of faculty in a department should be correlated with social capital (and therefore *indirectly* associated with departmental prestige) for the reason that a large faculty increases the number of interdepartmental links that can be created and maintained by a department. Apart from this, no other compelling theoretical reason has been established for a direct association between faculty size and departmental prestige. Finally, it is theoretically plausible to assert that departmental prestige has no recursive effect on faculty size.

Model 5 presents the instrumental variable estimates. The results are consistent with the findings of the previous model. As is typical in instrumental variable regression, there is a modest increase in the standard error associated with the social capital variable, but otherwise the two models are virtually identical. This adds to our confidence that the strong and highly significant effect associated with social capital in the estimation of departmental prestige cannot

[22] There are hardly any sizeable outliers on the social capital–prestige relationship. Departmental prestige is measured on a five-point scale, and in no case does the predicted score from the regression of prestige on social capital deviate from the actual prestige score by more than one point. A complete listing of observed and predicted values of prestige from model 3 is available upon request from the author.

[23] Thanks to Deputy Editor Chuck Halaby for suggesting the instrumental variable approach employed here.

be attributed to distortions introduced by simultaneity bias.

The findings reported in Table 4 remain robust across a variety of alternative specifications of the regression model and various transformations of the independent variables. Because of the correlation among different measures of scholarly productivity, the inclusion or exclusion of one such measure in the regression model often has small effects on the coefficients associated with other measures. For example, more parsimonious specifications of regression models 4 and 5, in which the three NRC productivity measures are omitted, yield slightly larger coefficients for the weighted article publications and book publications variables.[24] Similarly, experimenting with different transformations of the independent variables sometimes yields a modest increase in the coefficient associated with one productivity measure, but this usually comes at the expense of the variance explained by other such measures.[25] Regardless of the specification of the regression model, social capital alone remains a much stronger predictor of departmental prestige than any combination of productivity measures.

As a further test of the robustness of the model, I also conducted a parallel analysis in which I substituted for the dependent variable a second, slightly different, measure of departmental prestige reported in the NRC study. This second measure asks respondents to evaluate departments in terms of the "effectiveness of the program in educating research scholars/scientists" rather than the "scholarly quality of program faculty." The results of this analysis are virtually identical to those reported above. Social capital alone accounts for 81 percent of the variance in prestige rankings among sociology departments, compared with 53 percent for all measures of scholarly productivity combined. Productivity measures add little to the explanation of departmental prestige beyond what is accounted for by social capital. When both social capital and productivity measures are included in the same regression model, the beta weight for social capital is 5.8 times as large as that of the next strongest predictor of departmental prestige.

COMPARABLE FINDINGS FOR OTHER DISCIPLINES

The preceding analysis provides compelling evidence for the thesis that prestige rankings within the discipline of sociology are fundamentally an effect of the location of departments within disciplinary networks of association and social exchange. It is conceivable, however, that processes of social closure and the accumulation of social capital might play a larger role in the reproduction of status inequality within sociology than is true in other academic disciplines. To evaluate this possibility, I compiled and analyzed comparable data on departmental prestige and the interdepartmental exchange of PhDs for two other academic disciplines: history and political science.

The choice of these two disciplines was largely dictated by the availability of data. Most academic professional associations do not publish periodic directories of departmental faculty identifying the institution where each faculty member received his or her PhD. The practice is quite rare within the natural sciences, but more common among the social and behavioral sciences. Among the larger and more established social science disciplines, neither economics nor psychology publishes directories of this kind, but history and political science do. Analyzing comparable data for these two additional disciplines should provide a reasonable test of whether the patterns identified for sociology are general to the social and behavioral sciences. Whether they apply with equal force

[24] Given the sizable correlations among many of the independent variables, all five models were checked for multicolinearity. The variance inflation factor (VIF) does not exceed 2.5 for any variable in models 1–5. This is well below the commonly accepted threshold of 10 for indicating problematic colinearity (Belsley, Kuh, and Welsch 1980).

[25] For example, the citations variable has a moderately skewed distribution and is therefore a likely candidate for a logarithmic transformation. Applying a logarithmic transformation to the citations measure increases the significance of the coefficient associated with this variable, but it also increases the degree of colinearity between citations and weighted article publications, so there is little net gain in R^2 when these two measures are included together in the regression.

to the natural sciences or the humanities deserves further study.[26]

Using data from the American Historical Association's *Guide to Departments of History* (1994–1995) and the American Political Science Association's *Graduate Faculty and Programs in Political Science* (1995), I constructed PhD exchange matrices for history and political science following the same method described earlier for sociology. The matrix for history includes 108 PhD-granting departments and the matrix for political science includes 94 PhD-granting departments.[27] Bonacich's eigenvector centrality index was applied to these matrices to measure the social capital of each PhD-granting department within these disciplines. Departmental prestige ratings for history and political science were taken from the latest NRC survey (Goldberger, Maher, and Flattau 1995), along with three measures of faculty productivity: article publications, citations, and research support.

Tables 5 and 6 reports the coefficients for a series of regression models used to estimate the prestige ratings of graduate departments of sociology, history, and political science that are similar to those reported in Table 4 for sociology alone. The main difference between the regression models in Table 4 and those in Tables 5 and 6 is that the latter omit the more refined measures of faculty productivity developed by Keith and Babchuk (1998) for sociology, since comparable measures are not available for either history or political science. This means that the regressions in Tables 5 and 6 likely underestimate the association between faculty productivity and departmental prestige for history and political science. Comparisons with sociology on the three basic NRC productivity measures should, however, suffice to tell us whether these disciplines are roughly comparable or dramatically different in this regard.

There are some interesting differences in the prestige hierarchies of these three academic disciplines. Compared with sociology, status inequality in the placement of PhDs is somewhat more pronounced in history and political science. Five top history programs account for 39 percent of all PhDs employed in PhD-granting departments within the discipline, compared with 34 percent for political science and 32 percent for sociology. Twenty top history programs account for 77 percent of all such PhDs, compared with 74 percent for political science and 69 percent for sociology. Departmental inbreeding is also more pronounced among elite history and political science departments. Internal hires account for 31 percent of the faculty in the 5 top-ranked history departments, compared with 21 percent in the 5 top-ranked political science departments and 10 percent in the 5 top-ranked sociology departments.

As shown in Model 1 of Table 5, there is also a slightly stronger association between departmental prestige and the three NRC productivity measures for history and political science than there is for sociology. The three productivity measures account for 42 percent of the variance in prestige for political science, compared with 34 percent for history and 29 percent for sociology. This could signal the stricter application of meritocratic standards within history and political science compared with sociology, or it could simply indicate a closer match between these three specific measures of faculty productivity and the forms of academic performance that are most highly regarded within history and political science.

Despite these differences, there is one pattern that is virtually identical across all three disciplines: a strong association between social capital and departmental prestige. As shown in regression Model 2, social capital alone explains

[26] This should be possible, even in the absence of comparable directories of departmental faculty, if contemporaneous data can be collected at the time of the next NRC study of departmental prestige. The barrier to extending this study to a larger range of disciplines is the near impossibility of reconstructing historical data on departmental faculty and their PhD-granting institution for a year close to 1993, which is when the last NRC study was conducted.

[27] For history, these include all but two of the graduate programs evaluated in the NRC study. As I did for sociology, I omitted the Graduate Center of the CUNY because of its unconventional organizational structure and ambiguity in demarcating which faculty should or should not be counted within the program. I also omitted the Graduate School of the Claremont Colleges for the same reason. For political science, I omitted these two programs as well as the Political Economy program of the University of Texas at Dallas, where most faculty members earned their PhDs in economics and sociology rather than political science.

Table 5. Unstandardized Coefficients from the Regression of Departmental Prestige on Selected Characteristics of Graduate Departments of Sociology, History, and Political Science: Models 1 and 2

	Model 1			Model 2		
Independent Variable	Sociology (OLS)	History (OLS)	Political Science (OLS)	Sociology (OLS)	History (OLS)	Political Science (OLS)
Social Capital	—	—	—	1.359***	1.373***	1.335***
	—	—	—	(.061)	(.062)	(.061)
Article Publications	.040	1.334***	.271	—	—	—
	(.124)	(.101)	(.161)	—	—	—
Citations	.059*	.064	.116**	—	—	—
	(.023)	(.034)	(.040)	—	—	—
Research Grants	.022**	.031	.027*	—	—	—
	(.007)	(.023)	(.011)	—	—	—
Constant	1.821	1.710	1.786	–.469	–.205	–.284
Multiple R	.555	.600	.663	.918	.907	.917
Adjusted R^2	.285	.342	.421	.842	.821	.838

Note: Numbers in parentheses are standard errors; N = 94 for sociology and political science; N = 108 for history. OLS = ordinary least squares.
* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests)

82–84 percent of the variance in departmental prestige for each of the three disciplines. Indeed, across the three disciplines, the near perfect match in the regression coefficients and R^2 for the social capital variable is quite striking. Model 3 reveals that measures of faculty productivity add relatively little (2–5 percent) to the explained variance over and above what is accounted for by social capital alone. Even allowing for the fact that more refined measures

Table 6. Unstandardized Coefficients from the Regression of Departmental Prestige on Selected Characteristics of Graduate Departments of Sociology, History, and Political Science: Models 3 and 4

	Model 3			Model 4		
Independent Variable	Sociology (OLS)	History (OLS)	Political Science (OLS)	Sociology (IV)	History (IV)	Political Science (IV)
Social Capital	1.249***	1.255***	1.172***	1.272***	1.444***	1.286***
	(.064)	(.069)	(.062)	(.095)	(.096)	(.081)
Article Publications	.074	.482**	.207**	.075	.353*	.201**
	(.054)	(.146)	(.072)	(.055)	(.157)	(.074)
Citations	.014	–.016	.005	.013	–.028	–.016
	(.010)	(.017)	(.019)	(.011)	(.018)	(.020)
Research Grants	.004	.014	.017**	.004	.012	.016**
	(.003)	(.011)	(.005)	(.003)	(.012)	(.005)
Constant	–.525	–.303	–.344	–.569	–.606	–.552
Multiple R	.932	.921	.943	.932	.915	.940
Adjusted R^2	.863	.843	.884	.863	.831	.879

Note: Numbers in parentheses are standard errors; N = 94 for sociology and political science; N = 108 for history. OLS = ordinary least squares; IV = instrumental variable.
* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests)

of faculty productivity for history and political science should perform somewhat better than the three NRC measures, it seems unlikely that such productivity measures would eclipse social capital as the strongest predictor of departmental prestige. Model 4 shows that these results remain basically unchanged when an instrumental variable is substituted for the original social capital measure. The regression results for history and political science are thus consistent with those for sociology, indicating that the importance of social capital for departmental prestige is not unique to sociology.

DISCUSSION

I have elaborated and defended a conception of academic prestige that views status differences among academic departments as mainly rooted in processes of social closure and the accumulation of social capital. Status inequalities among departments are correlated with and reinforced by differences in scholarly productivity, and it is doubtful whether academic status hierarchies could maintain their legitimacy if this condition were not satisfied. Nevertheless, departmental prestige is not simply or primarily a matter of scholarly productivity—at least not within the discipline of sociology. This thesis may be viewed as heretical by some; however, it is consistent with some of the most well-established and widely accepted principles of social stratification. It is also consistent with a growing body of empirical evidence on the importance of social capital for status inequality and status attainment in a variety of other institutional and occupational contexts (Portes 1998; Lin 1999, 2001).[28]

The conception of academic prestige proposed in this paper helps to clarify anomalies encountered in the research based on the more conventional view. The less than perfect association between scholarly productivity and departmental prestige makes better sense once we recognize that, although the display of scholarly virtuosity is a norm that is strongly encouraged and supported within prestigious departments, it is not the ultimate guarantee of their social status. The puzzling association between faculty size and departmental prestige is also more comprehensible if faculty size is understood as a resource that facilitates the creation and maintenance of an extended network of interdepartmental relations, both through the hiring of PhDs from other departments and through the training of PhDs for employment in other departments. Finally, the incredible stability of departmental prestige rankings over long historical periods is more intelligible once we appreciate the self-reproducing capacity of social capital. The advantage that prestigious departments enjoy in the placement of their PhDs translates into a cumulative advantage in the maintenance and expansion of interdepartmental networks. This complements and reinforces other forms of cumulative advantage that have been identified in the literature.

Evidence that academic status hierarchies are reproduced through processes of social closure and the accumulation of social capital should deepen our appreciation of just how impervious to change such hierarchies can be. In Bourdieu's theory, the unequal distribution and self-reproducing capacity of social capital is a powerful source of social inertia—perhaps even more so than the ownership of economic capital, which, at least, is subject to the vicissitudes of the market. This is consistent with Weber's (1968:938) observation that stratification by status tends to be associated with social stasis, whereas the ascendance of market forces (and stratification by class) is more commonly associated with social change. A glance at Table 1, which shows the prestige ranking of sociology departments in seven different studies conducted between 1925 and 1993, should suffice to demonstrate just how effective processes of social closure and the reproduction of social capital can be in insulating academic status hierarchies from the winds of social, economic, and intellectual change.

What then accounts for occasional shifts in the prestige rankings of sociology departments over the decades? As noted previously, research shows that such changes in prestige rankings cannot be explained by changes in scholarly productivity (Baldi 1994; Keith and Babchuk 1998). The theory of departmental prestige proposed in this paper implies that significant shifts

[28] Of the many empirical studies of social capital, Anheier, Gerhards, and Romo's (1995) innovative study of social networks and prestige among German writers and literary critics comes closest in its methodology and findings to those of this paper.

in departmental prestige rankings must be the result of the forfeiture or acquisition of a substantial volume of social capital, but how does this occur? Although a thorough investigation of this question exceeds the scope of this paper, several logical possibilities present themselves. A department can suffer devastating internecine conflict, leading a substantial number of senior faculty members to depart for other universities, taking with them a share of the department's social capital. This occurred at Minnesota in the 1950s following F. Stuart Chapin's retirement after 29 years as department head (Martindale 1976:237) and at Columbia in the wake of the 1968 student strike (Clark 1996:200), leading both departments to drop significantly in the prestige rankings.[29] Alternatively, a department (especially if it is located in an already eminent university) can acquire the resources to recruit a substantial number of senior faculty from the most prestigious departments, thereby purchasing a share of those departments' accumulated social capital. This is the strategy followed by Berkeley in the 1950s, enabling it to establish itself as a top-ranked department within a few years of its founding (Marx 1984:649; Alford 1998:6).[30] Other departments have attempted to emulate this strategy in more recent years with varying degrees of success. In the absence of sizable migrations of well-connected senior faculty, shifts in the prestige rankings of academic departments are likely to be small and gradual.

Another characteristic of social capital that helps to insulate it from challenge or usurpation is the opacity of the motives implicated in the exchanges by which social capital is reproduced and expanded (Bourdieu 1986:242–3). As contrasted with economic capital, where the self-interest of persons seeking to reproduce and expand their capital is obvious to all, the exchanges by which social capital is accumulated assume an appearance of *disinterestedness*—for example, a dedication to art-for-art's sake or the advancement of science. The recourse to such motives is necessitated by the uncertainty that surrounds transactions involving social capital, which tend to be characterized by unspecified obligations, uncertain time horizons, and the possible violation of reciprocity expectations (Portes 1998:4). In the face of such uncertainty, egotistical calculation alone cannot be counted upon to motivate sufficient investment in social capital. Consequently, although it is appropriate to characterize the behavior by which individual faculty or departments seek to expand their social capital (and, thereby, enhance their prestige within the discipline) as strategic or instrumental, these strategies are typically embedded within, and subjectively experienced as indistinguishable from, a normative commitment to universalistic principles. This opacity (or duality) of motives has obvious advantages for the legitimacy of academic status hierarchies and helps to explain why such hierarchies have rarely been subjected to the kind of sustained critical scrutiny that sociologists have directed toward other forms of institutionalized inequality. This study, by seeking to elucidate the underlying structural basis of academic prestige hierarchies, is intended as a contribution to that kind of critical and reflexive sociological undertaking.

[29] Minnesota ranked among the top five to seven departments from the 1920s through the mid-1950s, but dropped to 15th by the late 1960s and 25th in the latest survey. Columbia ranked among the top two to three departments through the mid-1960s, but dropped to 7th by the end of the 1970s and now ranks 15th. Judging from data presented in Keith and Babchuk (1998), it does not appear that either department's decline in status can be attributed to a precipitous drop in scholarly productivity.

[30] Herbert Blumer was brought to Berkeley from Chicago in 1952 with a mandate and generous funding from Chancellor Clark Kerr to recruit prominent scholars from the leading departments in the discipline. Among those hired were Kingsley Davis, Seymour Martin Lipset, Erving Goffman, Philip Selznick, and Charles Glock. By 1957, Berkeley ranked sixth among sociology departments in the nation. During the 1960s it rose to number one and has remained among the top four ever since.

Val Burris *is Professor of Sociology at the University of Oregon. His current research interests include corporate power structure, right-wing movements, and social network analysis. His recent publications include "The Myth of Old Money Liberalism: The Politics of the Forbes 400 Richest Americans,"* Social Problems *47 (2000):360–78; and "The Two Faces of Capital: Corporations and Individual Capitalists as Political Actors,"* American Sociological Review *66 (2001):361–81.*

APPENDIX

Table A. Correlations, Means, and Standard Deviations of Variables

Variable	2	3	4	5	6	7	8	Mean	SD
1. Departmental Prestige	.92***	.41***	.47***	.46***	.68***	.60***	.63***	2.61	1.00
2. Social Capital	—	.30**	.37***	.39***	.61***	.48***	.67***	2.26	.67
3. Article Publications	—	—	.71***	.48***	.39***	.38**	.29**	2.14	1.04
4. Citations	—	—	—	.39***	.37***	.52***	.30**	5.50	5.32
5. Research Grants	—	—	—	—	.56***	.42***	.12	17.05	14.16
6. Weighted Article Publications	—	—	—	—	—	.54***	.21*	.67	.64
7. Book Publications	—	—	—	—	—	—	.14	.75	.52
8. Faculty Size (ln)	—	—	—	—	—	—	—	2.97	.42

* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests)

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