

---

## CATEGORICAL IMPERATIVES: THE STRUCTURE OF JOB TITLES IN CALIFORNIA STATE AGENCIES\*

---

DAVID STRANG  
*University of Iowa*

JAMES N. BARON  
*Stanford University*

*The division of labor in formal organizations has important consequences for the distribution of opportunities and rewards. This paper examines variations in job title structures across work roles. Analyzing 3,173 job titles in the California civil service system in 1985, we investigate how and why lines of work vary in the proliferation of job categories that differentiate ranks, functions, or particular organizational locations. The statistical analysis underscores the importance of three social forces shaping the division of labor: ascription by race and sex; the power and social standing of occupational groups, especially the professions; and organizational processes of rationalization. Some implications of these results for studies of organizations and social inequality are discussed.*

Remarkably little attention has been paid to the structure of job titles, despite the sociological importance of the topic. Distinctions among job titles are clearly relevant to social stratification, since wages, promotion opportunities, and other perquisites are often attached to jobs. From an organizational perspective, job definitions are central to the study of organizational structure. We examine the structure of job titles within a contemporary bureaucratic setting: California state government. In particular, we investigate variations in the proliferation of job titles across different kinds of work, asking why some work roles are subdivided into many job titles and others into very few.

An example helps illustrate the variations among jobs we have in mind. In the California state civil service, there is one basic job title for doctors, "Physician and Surgeon," with only a few distinct job titles specifying areas of medical specialization (e.g., dentist, podiatrist, pathologist). Moreover, while specialized titles characterize administrative positions in health and medicine (e.g., "Chief, Local Environmental Health Programs"), there is little verti-

cal differentiation among doctors; aside from the titles "Medical Resident: Various Specialties" and "Chief Physician and Surgeon" (who heads a hospital department), there are no gradations or levels among physician work roles. In other words, a highly complex and differentiated set of activities, which take years to master and often require the coordinated efforts of diverse specialists, is defined in an extremely simple and undifferentiated way.

The organization of engineering work in California state government is quite different. Major specialties such as civil, mechanical, and electrical engineering are represented by separate families of job titles. These specialties are often qualified by the name of the agency in which the work is done, such as "Highway Engineer (Dept. of Transportation)." Finally, there are detailed job ladders in each branch of engineering; for example, Principal, Supervising, Senior, Associate, Assistant, and Junior Civil Engineers. Here, the complexity of work seems isomorphic to the complexity of organizational charts within California state agencies. Why do occupations such as medicine and engineering exhibit such different patterns of job categorization within the same civil service

---

\* Please direct all correspondence to David Strang, Department of Sociology, University of Iowa, Iowa City IA 52242. A version of this paper was presented at the annual meeting of the American Sociological Association, Atlanta, Georgia, 1988. The authors gratefully acknowledge generous research support from the Stanford GSB; assistance from Paula England, Lucius Lau, Andrew Newman, Marilyn Pearman, and Marcos Polanco; and helpful comments from Elaine Backman, Michael Hannan, Rod Kra-

mer, Edward Lazear, Brian Mittman, Jeffrey Pfeffer, James Price, Peter Reiss, John Roberts, and the reviewers. This paper was partially completed while the second author was a Fellow at the Center for Advanced Study in the Behavioral Sciences; he gratefully acknowledges support from the Alfred P. Sloan Foundation and the Center staff, and from the Robert M. and Anne T. Bass Faculty Fellowship.

system?

Such variations are important because they provide insight into the organization of work. Yet many perspectives on organizations regard the specification of job titles and job boundaries as purely technical matters. A wealth of theory in administrative science and economics documents considerations promoting the detailed division of labor. It is assumed that roles are defined by efficiency imperatives, to ensure optimal specialization, allocation of personnel, and distribution of rewards (see Rosen 1983; Scott 1987, pp. 147-54).

Yet we know of few settings in which the definition and classification of positions is resolved naturally by a self-evident logic of efficient organizing. Moreover, scholars have suggested alternative motivations and consequences for the proliferation of job titles. Neo-Marxists, for instance, view differentiated job categories and job ladders as key features of bureaucratic control, used to coopt employees through internal labor markets, divide workers (particularly along race and gender lines), and weaken the power of occupational groups (e.g., Gordon 1972; Edwards 1979). Institutional theorists emphasize the way bureaucratic structures signal the organization's rationality and trustworthiness to external constituents (Meyer and Rowan 1977).

Although a large body of research examines how task specialization and differentiation vary across organizations, that work tends to take the existing division of labor in an organization as given and to focus on its efficiency-based correlates (e.g., scale, technology, and environmental complexity). Surprisingly little research takes the division of labor as problematic and examines its social and political determinants as well as administrative and technical factors. Consequently, important elements of social inequality and organizational politics may be generally overlooked — for instance, the possibility that positions dominated by women or nonwhites are defined differently than those dominated by white men.

The only large-scale quantitative study to pursue these concerns, to our knowledge, is Baron and Bielby's (1986) analysis of job title proliferation at the organization level. Baron and Bielby measure proliferation as the (log) ratio of the number of job titles used by an organization to the number of detailed *Dictionary of Occupational Titles* codes used by government analysts to denote those work roles.

Cross-sectional and longitudinal results corroborated a number of predictions that link the division of labor to technical imperatives — for instance, the proliferation of titles was greater in large organizations, in complex and diverse environments, and in organizations relying on firm-specific skills. However, their findings also underscore how political, social, and institutional forces shape the division of labor. For instance, craft unionism significantly reduced proliferation, whereas the presence of males, personnel professionals, and environmental pressures to develop bureaucratic structures (proxied by industrial sector) all favored job title proliferation.

In this paper, we build on the Baron and Bielby study, and examine how norms, power, and interests interact with technical considerations in shaping the organization of job titles in the California civil service. Our data permit a more refined analysis of job title proliferation. We examine the determinants of various *forms* (vertical, lateral, and organization-specific) of proliferation. Moreover, we analyze differences in proliferation across *work roles*, rather than across entire organizations, thereby eliminating distortions introduced by intraorganizational heterogeneity. Finally, we examine how proliferation is influenced by a number of factors about which Baron and Bielby lacked data, such as the pay level, professional standing, age, and organizational context of a specific work role.

## HYPOTHESES

We focus on several social forces governing the division of labor: the gender and racial composition of job incumbents; the power and professionalization of occupational groups; and the organizational context of work. For the sake of brevity and due to the absence of much prior research, our hypotheses primarily concern variations in overall job title proliferation. However, our empirical analyses distinguish three separate forms of position proliferation — distinctions by rank (vertical), detailed function (lateral), and organizational location (organization-specific) — and examine the determinants of each type.

H<sub>1</sub>: The greater the racial and gender heterogeneity within a work role, the greater the job title proliferation.

Baron and Bielby hypothesized that "organizations having a balanced gender mix would be

more likely to proliferate job titles, as a way of preserving the sexual division of labor" (1986, p. 576), and note that "detailed analyses of fragmentation within specific organizations and occupations would be most informative" (p. 577). Within occupations, demographic heterogeneity may prompt privileged incumbents to mobilize and differentiate along racial or gender lines, fostering vertical and horizontal distinctions to preserve status (and perhaps high pay rates). For example, white male lawyers might seek to distinguish themselves from an increasing number of female or nonwhite colleagues through the job classification system. DiPrete (1989, pp. 113-4) cites evidence that job title distinctions were advocated by early architects of the federal civil service to segregate the professions from lower status clerical and manual work.

Various studies show that such distinctions *do* favor the privileged. Since job titles dominated by women or nonwhites garner lower rewards than comparable positions staffed by whites and males (e.g., Baron and Newman 1989), white men have a clear interest in differentiating their job titles from those of women and nonwhites in the same line of work. Survey evidence indicates that men are more satisfied in occupations where job titles segregate by gender than they are in truly-integrated settings (Wharton and Baron 1987). Reskin and Padavic (1988) studied a plant undergoing a strike in which women temporarily staffed blue-collar jobs typically done by men. They found that male supervisors evaluated women's performance more favorably when the women were assigned to "gender-appropriate" tasks (plant cleaning and administration), compared to women who assumed duties typically reserved for men. Research by psychologists and anthropologists also documents the strategic use of categorization to preserve status and intergroup boundaries (Baron and Pfeffer, unpublished; Epstein 1988; Messick and Mackie 1989).

H<sub>2</sub>: The stronger a work role's claim to professional status, the less job title proliferation.

H<sub>3</sub>: Craft unionism is associated with lower job title proliferation, while proliferation is greater in work roles represented by industrial unions.

From another perspective, the proliferation of job titles may be seen as a form of bureau-

cratic control. Functional specialization limits the job incumbent's range of expertise and discretion. Formal vertical ladders of supervision and promotion threaten occupational collegiality and work autonomy. Job definitions that specify organizational location identify the worker's duties with the organization rather than the occupation. Finally, job title proliferation allows greater bureaucratic inspection and definition at the point of movement between jobs. For example, California civil service regulations require applicants for promotion into most job titles to pass state-administered exams.

Bureaucratic controls of this type should be resisted most strongly by well organized occupations with established claims to autonomy and expertise. In particular, we expect the professions to oppose job title proliferation. Professional work is traditionally defined by the larger occupation rather than the organization, with professionals able to declare evaluation from nonpeers as illegitimate and unacceptable (Friedson 1984). Norms of work autonomy, collegiality, and broad spheres of expertise (when viewed by those outside the profession) militate against the proliferation of job titles.

For similar reasons, craft unions should oppose highly differentiated job structures (Baron and Bielby 1986). Industrial unions, whose members typically lack the natural skill monopoly of craft workers, should favor distinctions among jobs, to obtain the power and security that accompany specialization (Piore 1982).

H<sub>4</sub>: The higher the average pay in a work role, the greater the job title proliferation.

Highly paid workers may seek expanded job title structures, particularly along a vertical dimension, to gain or preserve advantages. Civil service requirements usually limit the maximum salary of a job title to a percentage (generally around 121 percent) of its minimum starting salary. The length of the job ladder thus affects long-term salary prospects. Moreover, if there is greater variation in duties, requirements, and productivity in high-wage work than in low-wage work, organizations will seek more titles to have greater leeway in pay rates in the former category. Rank and organization-specific distinctions may also be incorporated into job titles in high-wage occupations to signal subtle distinctions across agencies in job requirements or the kind of person needed.

Because the professions are often highly compensated, hypotheses 2 and 4 may often work at cross-purposes. We may see extensive rank distinctions within highly-compensated professions in order to permit pay differentiation, particularly since civil service rules limit the permissible range of pay within a given job title. This is especially likely if professional norms discourage the creation of distinct administrative titles (e.g., "Manager, Legal Office") for individuals overseeing professionals. Instead, higher-level titles within the same professional family (e.g., "Attorney VI") may be created.

H<sub>5</sub>: The larger the agencies in which a work role is located, the greater the job title proliferation.

Large organizations are typically more bureaucratically organized and specialized in their tasks than small organizations (Pugh, Hickson, and Hinings 1969; Blau and Schoenherr 1971). In the face of potential resistance to job title proliferation by professionals and others, large agencies should also be less vulnerable to externally-imposed definitions of work, better able to develop internal labor markets (leading to rank differentiation), and better able to define work as organizationally-specific and non-transferable (Oi 1983).

H<sub>6a</sub>: The greater the number of organizations in which a work role appears, the greater the job title proliferation.

To the extent that agencies generate job titles that fit their own tasks, structures, and pay rates, we expect higher levels of proliferation in more "generic" lines of work.<sup>1</sup> In the California civil service, for instance, various occupations (such as cooks and bakers) have distinct sets of titles for positions located in and outside the Department of Corrections. Although the state's job descriptions indicate no differences in duties, responsibilities, or pay rates between these parallel sets of job titles, these seemingly unnecessary titles may capture subtle variations across agencies in the actual tasks performed.

H<sub>6b</sub>: The greater the number of organizations in which a work role is located, the less job title proliferation.

<sup>1</sup> Conversations with California state officials indicate that agencies are the chief source of requests for revisions to the civil service job structure.

Other arguments imply the opposite prediction. Work roles appearing in many organizations may be similar to the professions, in that duties are defined without regard to organizational context. Moreover, common and generic work roles (such as secretary) are more closely scrutinized by California's State Personnel Board and Department of Personnel Administration, which seek to rationalize job descriptions and reduce inequities by establishing "service-wide" job titles that are utilized throughout the civil service system. In contrast, occupations that appear in few agencies may involve organization-specific claims or resources, favoring job title proliferation. This is consistent with economic theories contending that organizations respond to human asset specificity by implementing administrative structures — including detailed divisions among jobs — that tie workers to the enterprise and reduce opportunism (Williamson 1975).

Job definitions reflect not only the contemporary organizational context, but also the historical conditions prevalent at the founding of organizational structures (Stinchcombe 1965; Meyer and Brown 1977). These historical conditions influence not only what arrangements are technically or administratively superior, but also what is socially and politically viable. Once in place, organizational structures exhibit considerable inertia, as a result of administrative, political, and moral barriers to change (Hannan and Freeman 1984).

It is not clear how changes in founding conditions have affected civil service job structures, however. An institutional perspective (Meyer and Rowan 1977) suggests that recently created jobs and occupations are more likely to embody many symbolic distinctions, and to be more fragmented than jobs established when the environment of state government was less elaborate and less formally organized (Meyer, Scott, and Strang 1987). On the other hand, State Personnel Board materials indicate persistent attempts to rationalize the civil service by creating standardized job classifications and eliminating job titles held by few employees. This move to streamline job titles is not unique to the California civil service, as concerns with pay equity and skill transferability have prompted many employers and unions to streamline job classification systems (e.g., Fanning 1990).

Ideally, these issues should be studied with longitudinal data on the evolution of jobs and

job families. Lacking such data, and given that there are competing plausible predictions, we do not offer a hypothesis regarding the effect of founding conditions. Rather, we simply report exploratory results indicating how proliferation varies with the age of a work role.

There are obviously factors related to technical efficiency that may shape the division of labor, but about which we have not advanced hypotheses. Our analyses address those factors in several ways. First, we control for the number of incumbents in each work role, a factor clearly related to the usefulness of job title proliferation. Second, several of the variables discussed above — such as pay rates and the size and diversity of organizations where work is typically done — may capture differences among work roles that make job title proliferation efficient. (However, we show below that the findings for organizational size and diversity are generally *opposite* from what one would expect if these variables capture “efficiency imperatives.”) Third, most of our statistical analyses examine variations in job title proliferation among nearly 1,500 detailed work roles — such as “Civil Engineer” vs “Painter” — to minimize the impact of unmeasured differences in skills, responsibilities, or other characteristics that mandate proliferation on purely technical grounds.

Because our analysis is cross-sectional, it can tell us little about the dynamics of job title proliferation or the possibility of alternative casual orderings among variables. In some cases this seems unproblematic. For example, the professional status of an occupation is quite stable over time and unlikely to be affected by California civil service job categories. In other cases, cross-sectional results may be misleading due to rapid shifts in independent variables over time, or relationships might run in the opposite direction from those postulated. For instance, hypothesis 1 argues that changes in the demographic composition of occupations foster job title proliferation, rather than job title proliferation producing subsequent shifts in demographic composition. Although there is considerable quantitative, historical, field, and experimental evidence consistent with our stance (e.g., Baron and Bielby 1986, Table 2; Reskin and Padavic 1988; Messick and Mackie 1989), longitudinal research is required to adjudicate among such competing accounts. Analyzing job title proliferation over time presents methodological difficulties that our study could not surmount, such

as being able to trace the history of a given work role to distinguish job “births” and “deaths” from transformations or renamings of existing positions. Accordingly, we present cross-sectional results and hope that future research will speak more directly to the causal relationships involved.

#### DATA, MEASURES, AND METHODS

Our data describe job classifications and requirements, race and gender composition, and organizational setting for job titles in the California civil service system as of March, 1985. The data set is described in detail elsewhere (Baron and Newman 1989).

Testing the hypotheses outlined above requires measures of job title proliferation within the different occupations found in California state government. We grouped job titles into 1,490 “job stems,” groups of titles sharing the same basic work content and a common semantic designation, such as “Civil Engineer,” “Legal Counsel,” and “Painter.” Job stems were constructed by coders from a list of 3,173 civil service job descriptions and titles.<sup>2</sup>

We measure *total job proliferation* as the number of job titles in each stem. *Vertical proliferation* is the length of the longest chain of explicitly-ranked titles within the stem. For instance, if the job stem included a series of job titles ranging from “Chicken Inspector I” to “Chicken Inspector V,” and if no other set of jobs in the stem had a longer ladder, vertical proliferation would equal five for that stem. *Functional proliferation* is the number of job titles within the stem which include detailed functional descriptors, such as Chicken Inspector (Wings) and Chicken Inspector (Thighs). *Organization-specific proliferation* is the number of job titles that specify a particular state agency, subunit, or program as part of the title. These measures do not sum to total prolifera-

<sup>2</sup> Unfortunately, there is no comprehensive job analysis or evaluation system for state civil service jobs to determine whether job titles represent distinct work activities. We identified sets of comparable work roles by instructing coders, who knew nothing about the larger purposes of the study, to look for semantic commonalities among job titles (e.g., Bridge Engineer I, Bridge Engineer II, Supervising Bridge Engineer) and to inspect civil service job descriptions for job content and education and experience requirements. Problematic cases were resolved by the authors.

tion, since jobs may exhibit multiple forms of proliferation.

At a higher level of aggregation, we examine the proliferation of job stems. Here we make use of the California civil service detailed "schematic" classification, which groups job titles into 275 categories based on an occupation and industry scheme. At this level of analysis, proliferation is the number of job stems in each occupation-industry category.

The dependent variables are all counts with the general form of a Poisson distribution. Employing Poisson regression techniques (Maddala 1983, pp. 51-54), models take the form:

$$\Pr(Y_i = k) = \exp(-\lambda_i) \lambda_i^k / k!$$

where  $\lambda_i$  is an exponential function of independent variables (to ensure non-negative values), and  $k$  denotes the value (count) for the particular measure of job title proliferation. We subtracted one from the measures of proliferation to give them a natural zero point if one did not already exist.<sup>3</sup> For each case,  $\lambda_i$  is the expected level of proliferation; a unit change in an independent variable,  $X_n$ , multiplies  $\lambda_i$  by  $\exp(\beta_n)$ .<sup>4</sup> Parameters were estimated by the method of maximum likelihood.

Explanatory variables include the proportion female and the proportion nonwhite among full-time incumbents in each occupation or job stem as of March 31, 1985.<sup>5</sup> We also include quadratic terms,  $pq$ , where  $p$  is the proportion female (or nonwhite) in the stem and  $q=1-p$ . These terms measure the balance in gender and race composition, reaching a maximum when equal numbers of men and women (or whites and

<sup>3</sup>For example, a job stem containing only one job title is scored as having total and vertical proliferation equal to 0. The measures of functional and organization-specific proliferation, which can assume values of 0, were not transformed.

<sup>4</sup>A Poisson distribution implies that the mean and variance are equal. The two are quite close for our measure of vertical proliferation, but the variance is considerably larger than the mean for the total and functional proliferation measures, and for the number of job stems in detailed occupations (see Table 1). These discrepancies are largely a function of a few outliers in the data; excluding them from the analysis does not substantially alter the results.

<sup>5</sup>The nonwhite category includes blacks, Hispanics, Asians, and all other racial minorities. Excluding Asians from the nonwhite category does not alter the results.

nonwhites) are employed in a stem.<sup>6</sup>

To measure professionalization, we grouped occupations into six broad lines of work: clerical, manual, craft, technical, administrative, and professional. These categories were derived by collapsing categories from the state government's occupational scheme. Each job stem was characterized by a set of binary variables, where the variable for the dominant job type is coded as 1. The variable for professional work serves as the omitted category. Each detailed occupation was characterized by the proportion of job titles falling in each of these six categories, with the proportion in professional titles serving as the reference category. More detailed analyses of how occupational prestige, credentialing, and specialized training affect job title proliferation are also reported below.

Within each job stem and detailed occupation, we measured the proportion of job titles in each of three types of unions (craft, industrial, and autonomous professional), with the omitted variable denoting the fraction of jobs not covered by collective bargaining. Job titles were coded as covered by craft unions if they were in any of the following civil service bargaining units: highway patrol; corrections; protective services and public safety; firefighter; craft and maintenance; stationary engineer; and printing trades. Although collective bargaining units covering some white-collar (especially semi-professional occupations) are likely to resemble "industrial" unions, it was not clear *a priori* whether unions covering high-status professionals in the civil service (e.g., attorneys or physicians) would be more likely to reflect a "craft" or "industrial" orientation. Accordingly, we created a professional union category covering titles in the following bargaining units: attorney and hearing officer; professional engineer; professional scientific; and physician, dentist, and podiatrist. Job titles were coded as belonging to industrial unions if they were in any of the following bargaining units: administrative, financial, and staff services; education and library; office and allied; engineering and scientific technicians; custodial and services; registered nurse; psychiatric technician; health and social services professional; or medical and social services support.

We measure pay levels by calculating the

<sup>6</sup>In the California civil service, nearly half (44.2 percent) of all full-time workers in March 1985 were women, and 34.3 percent were nonwhite.

average minimum prescribed monthly starting pay rate over job titles in each job stem or occupation. (Each job title has a minimum and a maximum pay level; the two are almost perfectly correlated.) Founding conditions are assessed using the age of the job stem within California state government, calculated as 1985 minus the year of founding for the *oldest* job title within the job stem.

Organizational context is measured along two dimensions. Agency size is the mean number of full-time employees of agencies in which a job title is located. Similarly, agency settings equals the number of agencies in which the title appears. Both variables are averaged across the titles making up a stem or occupation, and transformed to a logarithmic metric to reduce skewness. As an additional control, all models include the (log) number of individuals employed in the occupation or job stem.

## RESULTS

Table 1 reports descriptive statistics for independent and dependent variables at the job stem and detailed occupation levels of analysis. Of the 1,490 job stems identified, 67 lacked data on relevant independent variables. Three of the 275 occupations lacked data in the more aggregated analyses. In addition, 25 job stems were not aggregated to the detailed occupation level because they spanned more than one occupational category.

### *Job Title Proliferation in Job Stems*

Table 2 reports estimates from Poisson regression models of job title proliferation at the job stem level. These data include several outliers, most notably a "Program Technician" stem involving 105 job titles. Regressions omitting this stem and two other outliers did not alter the results presented below.

The positive and significant quadratic coefficients in Table 2 indicate that gender and racial heterogeneity increase total job stem proliferation, as predicted. Combining the linear and quadratic effects in Table 2 indicates that job title proliferation is estimated to reach a maximum when 30 percent of job stem occupants are female and 36 percent are nonwhite.<sup>7</sup>

<sup>7</sup> The demographic mix at which maximal or minimal proliferation is observed equals  $(A + B)/2B$  in our models, where A equals the linear effect of

Table 1. Descriptive Statistics for Job Stems and Detailed Occupations

	Job Stem (N = 1423)		Occupation (N = 272)	
	Mean	S.D.	Mean	S.D.
<i>Proliferation Measures</i>				
Total	1.16	3.52		
Vertical	.93	1.20		
Functional	.44	3.37		
Organizational	.55	1.58		
Number of stems			4.37	5.09
<i>Independent Variables</i>				
Proportion female	.26	.33	.25	.24
(Proportion female) × (proportion male)	.08	.09	.12	.09
Proportion nonwhite	.24	.26	.26	.16
(Proportion nonwhite) × (proportion white)	.11	.10	.16	.07
Job age	22.18	16.39	38.93	15.72
Pay level	\$2550.00	\$880.10	\$2606.55	\$807.90
Agency size (log.)	7.59	1.38	7.94	1.01
Agency settings (log.)	.34	.73	.45	.70
Incumbents (log.)	2.22	1.91	4.33	1.97
<i>Unionization</i>				
Proportion craft union	.14	.32	.13	.26
Proportion industrial union	.31	.44	.30	.34
Proportion professional union	.08	.24	.09	.21
<i>Occupational Category</i>				
Clerical	.05	.22	.04	.18
Manual	.05	.22	.03	.14
Craft	.07	.26	.08	.25
Technical	.22	.41	.21	.30
Administrative	.24	.42	.24	.31

These results are consistent with previous research suggesting the use of job categories to preserve inequalities between groups (e.g., Conk 1978; Baron and Bielby 1986; Bielby and Bielby 1989, tables 29 and 30).

Analyses of the separate forms of proliferation suggest that the relationship between demo-

demographic composition and B the quadratic effect. This value is a maximum when  $B > 0$  and a minimum when  $B < 0$ .

Table 2. Poisson Regression Coefficients for Types of Proliferation in 1,423 Job Stems in the California Civil Service, 1985

Independent Variable	Type of Job Title Proliferation			Organization-Specific
	Total	Vertical	Functional	
Proportion female	-.745**	-.620**	-.933**	-.312
(Proportion female) × (proportion male)	1.883**	1.471**	1.485**	-1.096*
Proportion nonwhite	-1.067**	-.185	.548*	.246
(Proportion nonwhite) × (proportion white)	3.856**	1.767**	-.445	-.691
Job age	.012**	.007**	.007**	.008**
Pay level (in \$1000s)	.100*	.048**	-.046	.351**
Agency size (log <sub>e</sub> )	-.134**	-.107**	-.122**	-.083**
Agency settings (log <sub>e</sub> )	-.323**	-.120**	-.600**	-.490**
Incumbents (log <sub>e</sub> )	.500**	.287**	.675**	.371**
<i>Unionization:</i>				
Proportion craft union	-.769**	-.503**	-.665**	-.251
Proportion industrial union	.018	-.311**	.933**	.035
Proportion professional union	.143	.242*	.419	-.905**
<i>Occupational Category:</i>				
Clerical	.852**	.030	1.567**	-.209
Manual	.117	-.177	-1.511**	.310
Craft	.345**	-.200	-.500*	-.398*
Technical	-.321**	-.102	-.812**	-.405**
Administrative	-.086	-.360**	.377**	.337**
Constant	-1.131**	-.246	-2.816**	-1.659**
Likelihood ratio $\chi^2$	512**	239**	353**	490**

\* $p < .05$  (two-tailed)    \*\* $p < .01$  (two-tailed)

Note: Likelihood ratio tests compare the displayed model to a model including a constant term and (log) incumbents (d.f. = 16). Omitted categories are proportion nonunion and the professional occupational category.

graphic composition and proliferation is due mainly to its impact on the length of job ladders. The maximum effect is observed at 29 percent female and 45 percent nonwhite. Vertical proliferation may thus serve to differentiate the pay and status of elite incumbents from nonelites in the same line of work. This conclusion is supported by other research documenting higher prescribed pay rates for California civil service job titles staffed by white males than for comparable titles staffed disproportionately by women or nonwhites (Baron and Newman 1989).

Table 2 indicates that more gender-balanced job stems also exhibit greater functional proliferation. The results for race composition suggest, unexpectedly, greater functional proliferation in job stems monopolized by nonwhites.

For instance, the predicted effect of proportion nonwhite on functional proliferation is .015 in stems having 10 percent nonwhite incumbents, .163 in stems having 50 percent nonwhites, .290 in stems with 70 percent nonwhites, and jumps to .548 in stems having no white incumbents. Gender and race composition have little effect on the level of organization-specific proliferation.

Highly paid job stems show greater proliferation of job titles, as expected. This is especially true for organization-specific proliferation. Highly paid jobs are likely to be qualified by the name of the agency or program where the incumbent is located.

Although we expected work in large agencies to show greater job title proliferation, results indicate that job stems in large agencies



show less proliferation of all types.<sup>8</sup> This unexpected result is less anomalous when interpreted in light of the apparent rationalization of civil service job titles over time. We suspect the job structures of large agencies are scrutinized more carefully than those of small agencies. Moreover, large state agencies employ their own personnel and affirmative action functionaries, whose efforts may contribute to a streamlined job classification system.<sup>9</sup> For these reasons, large agencies may have borne the brunt of civil service efforts at rationalization. Organizational scale might have exhibited quite different effects if there was little pressure for rationalization or if the organizations studied were not tied to a common system of job definitions.

We identified plausible arguments for a positive *or* negative relationship between job title proliferation and the number of agency settings. According to Table 2, all types of job title proliferation are greater in job stems confined to fewer agencies. Among job stems appearing in many agencies, efforts to rationalize "service-wide" titles apparently outweigh organizational demands for agency-specific titles. This result is consistent with transactions cost theories linking bureaucratic and hierarchical structures to human asset specificity.

There is greater proliferation of every type within older work roles. One interpretation is that older job stems were structured prior to contemporary pressures for the rationalization and streamlining of job titles. An alternative argument is that ours is a sample of work roles that have "survived," and of these, the older ones have simply had more time to be elaborated on. Supplementary analyses generally support the latter account.<sup>10</sup> These findings are

<sup>8</sup>Suspecting a curvilinear relationship, we replaced the logarithmic specification with linear and quadratic terms, but found that the negative effect held across the range of organizational sizes in our sample.

<sup>9</sup>Consistent with this speculation, Baron, Mittman, and Newman (forthcoming) report that large state agencies, which are required to have affirmative action programs, exhibit less differentiated job structures (relative to their size), thereby increasing gender integration.

<sup>10</sup>We attempted to adjust for the addition of new job titles accumulating within established job stems by controlling for the "expected age" of a job stem, given the number of titles it embraced in 1985. Monte Carlo simulations were conducted to estimate the expected age of job stems, assuming that job titles were created at a constant rate over time (and thus

merely suggestive, however, since analysis of surviving jobs and stems could provide misleading evidence about the dynamics of job title creation and restructuring.

Table 2 reveals that craft unions discourage job title proliferation. Relative to nonunionized job stems, work covered by craft unions exhibits significantly less total, vertical, and functional proliferation. (The effect of the occupation dummy variables in Table 2 also reveals less organization-specific proliferation among craft roles than in administrative, manual, or professional work [the omitted category].) As expected, industrial unionism is associated with greater functional proliferation of job titles. However, like craft unionism, industrial unionism actually *diminishes* vertical proliferation, relative to job stems that are either not unionized or represented by professional unions (see below). Because the effects of industrial unionism vary by type of proliferation, the effect on total proliferation in Table 2 is negligible.

Professional unionism also has offsetting effects on job title proliferation. On the one hand, it discourages organization-specific proliferation, relative to craft-, industrial-, and nonunion jobs. On the other hand, professional unionism is strongly associated with vertical proliferation, presumably to provide pay and status hierarchies for the high status incumbents represented by these unions. (Supplementary analyses indicate that pay level has a strong and significant positive effect on vertical proliferation when the professional unionism variable is omitted from the model.) These results are consistent with our earlier speculation: professional unions resemble craft unions in discouraging some horizontal distinctions among job stems, while *encouraging* greater vertical differentiation. By seeking more finely-graded hierarchies, professional unions can secure pay advancement opportunities for their highly paid

that job title ages are identically and independently distributed random variates with an exponential distribution). In a stem with 25 titles, for instance, we simulated an expected "birthdate" for that stem's oldest job title. (An equivalent approach would have been to control for the expected number of titles in the stem, given the age of the oldest job.) Controlling for its expected age, the actual age of the job stem no longer had a significant effect on proliferation. This suggests that the positive effect of stem age has more to do with the gradual addition of job titles to surviving stems than with the timing of a work role's "entry" into the civil service.

Table 3. Poisson Regression Coefficients for Job Stem Proliferation in 272 Detailed Occupations in the California Civil Service, 1985

Independent Variable	
Proportion female	-.345
(Proportion female) × (proportion male)	3.167**
Proportion nonwhite	-.975*
(Proportion nonwhite) × (proportion white)	1.411
Job age	.011**
Pay level (in \$1000s)	.038
Agency size (log <sub>e</sub> )	-.214**
Agency settings (log <sub>e</sub> )	-.275**
Incumbents (log <sub>e</sub> )	.366**
<i>Unionization:</i>	
Proportion craft union	.403
Proportion industrial union	.380**
Proportion professional union	-.237
<i>Occupational Category:</i>	
Proportion clerical titles	.220
Proportion manual titles	.091
Proportion craft titles	.273
Proportion technical title	-.101
Proportion administrative titles	.609**
Constant	.286**
Likelihood ratio $\chi^2$	202**

\* $p < .05$  (two-tailed) \*\* $p < .01$  (two-tailed)

Note: Likelihood ratio tests compare the displayed model to a model including a constant term and (log) incumbents (d.f. = 16). Omitted categories are proportion nonunion and proportion in professional occupations.

members without compromising professional norms of collegiality, which favor longer job ladders over distinct families of job titles for the practice and management of a profession (cf., DiPrete 1989, pp. 135-6). Professional unionism has intermediate effects on functional proliferation, promoting more proliferation than craft unionism but less than industrial unionism ( $p < .01$  for both contrasts if the proportion of titles covered by professional unions is the reference category, rather than the proportion of nonunion titles as in Table 2).

Binary variables characterizing job stems by predominant type of work as clerical, manual, craft, technical, or administrative depict differences in job title proliferation relative to the professions (the omitted category). Total proliferation in predominantly professional job stems is moderate, rather than low as hypothe-

sized. Only predominantly clerical and craft job stems exhibit significantly more total proliferation than professional stems.

In addition, job ladders are actually *longer* in professional job stems than in other kinds of stems. The control for professional unions mediates most of the occupational differences, which are otherwise substantial and significant. Again, this result is consistent with notions of professional autonomy and collegiality. Our inspection of professional job ladders indicates they are often lengthy because they range from entry-level jobs through to highly-paid management positions (from Junior to Principal Civil Engineer, for example), whereas non-professional work typically involves more rigid distinctions between "line" and administrative roles (and ladders).

It is somewhat surprising that clerical work should appear relatively proliferated. Secretarial work, the major clerical position, is generally thought to have little room for vertical or lateral specialization. This is borne out in California government agencies, in which there are very few secretarial job titles, especially given the large number of secretaries. But other clerical job stems, such as personnel assistant, microfilm technician, and telephone operator, display quite elaborate job title structures. In fact, the generally high levels of proliferation within clerical titles underscores the peculiar situation of the secretary.

#### *Job Stem Proliferation in Occupations*

We now examine job title proliferation at a more aggregate level. Some occupations may have many job stems but exhibit little proliferation within stems, while other occupations display the opposite pattern. Table 3 examines this dimension of work role fragmentation, reporting an analysis of the number of stems within occupation-industry categories.

The results in Table 3 are generally consistent with those in Table 2. The most appropriate comparison is with the results for functional proliferation in Table 2, since the number of job stems within an occupation may be interpreted as gross functional differentiation. Gender balance significantly increases the number of job stems within an occupation; maximal differentiation occurs in occupations that are 45 percent female. Agency size and agency settings decrease the number of job stems, as they did for the proliferation of titles within

stems. The net effect of pay level on the proliferation of job stems is nonsignificant, as it was for functional proliferation within job stems.

The effects of racial composition differ from those in Table 2. There is a significant negative effect of proportion nonwhite on the proliferation of job stems within occupations, and a positive (but insignificant) quadratic effect. It appears that differences in the percentage of nonwhite incumbents in an occupation are not terribly relevant for the proliferation of job stems, *as long as whites comprise a clear majority within the occupation*. For instance, the coefficients in Table 3 imply that the effect of proportion nonwhite is  $-.975$  in occupations staffed entirely by nonwhites,  $-.386$  in occupations having 70 percent nonwhite incumbents,  $-.135$  in occupations with a 50/50 mix,  $.029$  in occupations having 10 percent nonwhite incumbents, and 0 in occupations staffed entirely by whites. Thus, the presence of *any* whites in an occupation is associated with proliferation of job stems, perhaps to preserve racial segregation, but the tendency toward such differentiation abates once nonwhites no longer dominate an occupation.

Industrial unionism is associated with greater functional distinction within an occupation, as was true in the job stem analysis. The stem- and occupation-level results differ, however, in the comparison between professions and other occupations. At the detailed occupation level, there is roughly as much job stem proliferation in the professions as in the clerical, manual, and technical occupations, and *less* than in the craft and administrative occupations.<sup>11</sup> This effect contrasts with findings at the job stem level, which portrayed professional roles as more fragmented than other kinds of work.

The high degree of lateral proliferation among administrative workers is noteworthy. At the job stem level, agency names were frequently part of administrative titles. At the level of detailed occupations, administrative occupations also exhibit the most functional differentiation (i.e., separate job stems). Administrative work is an important area in which civil service efforts to eliminate "one person jobs" have been unsuccessful. Presumably a principal function of agency administrators is to represent the organization to various publics, making the

<sup>11</sup> In a model excluding the unionization variables, the contrast between craft and professional occupations is significant at the .05 level.

name of the agency, department, or program a salient part of the job even if pay, requirements, and duties are indistinguishable from parallel positions in other organizations. Moreover, individuals in visible administrative positions may have greater power to pursue the status marker of individualized job titles (Miner 1987).

In any event, our hypothesis concerning the professions appears to be supported more consistently at the occupational level than at the job stem level. The effects of professional standing may be more complex than we hypothesized. On the one hand, professionalization may make activities within an occupation more coherent and institutionalized, thereby inhibiting subdistinctions in lieu of such master categories as "biologist" or "architect." At the same time, professional linkages to formal training programs and established bodies of theory that demarcate functional specialities, combined with the need to use job titles to justify pay and rank differentiation in the civil service, may explain why professions exhibit vertical and functional proliferation *within* these unified master categories. Accordingly, we examine the impact of professional standing in more detail.

#### *The Impact of Professional Standing on Proliferation Within Job Stems*

To further explore how professional standing affects job structures, we selected a sample of 46 occupations for closer examination. These were defined at the level of three-digit Census categories and mapped to civil service jobs through inspection of state job descriptions. The occupations range from the traditional independent professions (such as physicians, lawyers, and architects) to occupations with weak claims to professional standing (real estate agents and brokers, foresters and conservationists, and bookbinders). We identified 747 job titles within 256 job stems comprising these 46 occupations within California state government.<sup>12</sup>

Three measures of professional standing, central to past theoretical and empirical work,

<sup>12</sup> A list of the occupations and scores for various types of job title proliferation is available from the authors. Matching these job titles to Census occupation categories and coding the professionalism variables required careful study of each job description. The time involved deterred us from coding all 3,173 jobs in the civil service.

Table 4. Poisson Regression Coefficients by Type of Job Title Proliferation in 256 Job Stems: Subsample of 46 Occupations

Independent Variable	Dependent Variables: Type of Job Title Proliferation			
	Total	Vertical	Functional	Organization-Specific
Occupational prestige	-.017**	-.000	-.053**	-.045**
Credential requirement	.353**	-.130	1.212**	1.792**
Specialized training	-.363**	-.007	-1.300**	-1.410**
Proportion female	-.511	-.207	-.166	-1.550**
(Proportion female) × (proportion male)	3.162**	.293	4.247**	8.463**
Proportion nonwhite	-1.676*	-.038	1.238**	.783
(Proportion nonwhite) × (proportion white)	2.827	1.328	-4.979**	-8.943**
Job age	.010**	.007*	.001	.005
Pay level (in \$1000s)	.323**	.322**	.970**	.094
Agency size (log <sub>e</sub> )	-.094*	-.063	-.226**	-.048
Agency settings (log <sub>e</sub> )	-.102	-.012	-.716**	.152
Incumbents (log <sub>e</sub> )	.426**	.269**	.628**	.655**
Constant	-.515	-1.140*	-.333	-.336
Likelihood ratio $\chi^2$	82**	42**	115**	158**

\* $p < .05$  (two-tailed)    \*\* $p < .01$  (two-tailed)

Note: Likelihood ratio tests compare the displayed model to a model including a constant term and (log) incumbents (d.f. = 11).

were constructed for the job titles in this sample: occupational prestige, professional credentialism, and specialized training. For each job stem, occupational prestige is the Siegel (1965 NORC "male") prestige score for the larger occupation, based on the corresponding 1970 three-digit Census occupational code (Hauser and Featherman 1977). Professional credentialism was coded for each job as a binary variable indicating whether the civil service job specification lists a required professional credential (such jobs include nurses and dental hygienists as well as physicians). Specialized training is a binary variable indicating whether the job requires completion of a formal program of training substantively connected to its duties. In aggregating measures to the job stem level, professional credentialism and specialized training equal the proportion of job titles within the stem requiring credentials or specialized training. The three measures of professional standing replace the occupation variables used in Tables 1-3 to differentiate among broad lines of work.<sup>13</sup>

<sup>13</sup>We also omit the unionization variables in this largely white-collar subsample. In supplementary analyses including the unionization variables, industrial unionism strongly increased functional proliferation, whereas professional unionism had a slight

Table 4 reports the results of Poisson regression analyses of proliferation in job stems for this subsample. We focus on the effects of the three dimensions of professional standing; coefficients for other variables are generally consistent with those in Table 2.

As predicted, high occupational prestige significantly decreases total job title proliferation in a job stem, as well as the number of functional and organization-specific distinctions. An example is the strikingly small number of titles for medical doctors cited above. Another is the clergy; the California civil service distinguishes Protestant, Catholic, Jewish, and Muslim chaplains, but has not attempted to set up its own religious hierarchy or to demarcate distinct pastoral duties (e.g., "Chaplain III" or "Chaplain, Emergency Relief Program") through job titles.

On the other hand, job stems with credentialing requirements exhibit significantly more job title proliferation. Some insight into this result is provided by examining job stems that require professional credentials and also exhibit unusually large numbers of job titles. They are mainly "semi-professions" such as teaching,

effect in the opposite direction. Otherwise, the pattern of effects was the same as in Table 4.

nursing, and social work (in which women are relatively prevalent), that have sought professional status recently from a relatively weak organizational position (Wilensky 1964). The relationship between credentialism and job title proliferation thus seems to reflect the weaker professional base of highly-credentialed occupations, once occupational prestige is held constant.<sup>14</sup>

Specialized training, like prestige, has significant negative gross and net effects on job title proliferation. Since many semi-professions have credential requirements, the specialized training variable may be a better indicator than credentials of the extent to which occupations are theoretically grounded and control their own reproduction (Jamous and Peloille 1970; Larson 1977). The fact that job stems lacking specialized training exhibit *greater* job title proliferation again suggests that detailed job categories are often used to compensate for the absence of a "natural" skill monopoly (Baron and Bielby 1986).

According to Table 4, professional standing affects job structures mainly through lateral, rather than vertical, proliferation. None of the dimensions of professional standing significantly affects the length of job ladders. Nor do such variables as gender and racial composition or agency size and settings, which had significant effects on vertical proliferation in the full sample analysis. Rather, in this sample of largely white-collar (and highly compensated) occupations, vertical proliferation appears mainly related to the exigencies of pay gradation within the civil service system.<sup>15</sup>

<sup>14</sup> In other words, although credentialism is positively correlated with occupational prestige, job stems with credential requirements exhibit greater proliferation than equally prestigious job stems without such requirements. Due to this suppressor effect, the effect of credentialism on proliferation is not significant when prestige is omitted from the model.

<sup>15</sup> One might ask whether these dimensions of professional standing — especially credentialism and training — actually measure the *task complexity* of work roles. In an attempt to control for this, we computed the average minimum formal educational requirements associated with job titles, which presumably captures differences in task complexity. When we added this measure to the specification in Table 4, proliferation was found to be greater in job stems with higher education requirements. However, including this control did not alter the effects of the dimensions of professional standing.

## DISCUSSION

The division of labor is a central feature of formal organizations with decisive consequences for the distribution of opportunities and rewards. This is especially true in highly bureaucratized settings such as state government agencies, in which pay and promotion are a function of the worker's job category. Studies of organizations and of social stratification often treat the categorization of jobs as a matter that is resolved "naturally" by technical imperatives shaping the organization of work. In contrast, we have emphasized social, political, administrative, and historical factors influencing the structure of job titles. In the California civil service, three factors are especially important: the demographic composition of job incumbents; the power and professional standing of occupational groups; and organizational processes of rationalization.

Work roles employing a balance of male and female workers show high levels of proliferation of all types. Race composition has similar effects on total job title proliferation, but inconsistent effects across specific forms of proliferation. These effects are based on statistical models that controlled for differences among work roles in number of incumbents, pay level, and organizational setting, as well as occupational prestige, credentialism, and training requirements. It thus seems unlikely that the net effects of gender and race composition reflect unmeasured characteristics of jobs.

Rather, it appears that the demographic composition of incumbents *directly* affects how work roles are structured, even in a system as bureaucratized and rationalized as the California civil service. A 1934 report by a state government official noted that when establishing pay rates for civil service jobs, in addition to market and skill factors, "certain supplemental factors were also taken into consideration, namely, the . . . age, sex, and standard of living of the employees normally recruited for a given [job]" (Becker 1934, p. 62). The fact that the architects of the civil service based job pay rates on characteristics of incumbents suggests that jobs were also *defined* in terms of incumbent characteristics, either accidentally or explicitly. Our findings regarding the effects of demographic composition on proliferation suggest an enduring legacy of that ascription.

The implications of this kind of job title proliferation for stratification are clear. The asso-

ciation between ascriptive characteristics and detailed distinctions among job titles suggests that job title proliferation serves to segregate sexes and races within seemingly integrated lines of work. In supplementary analyses, we confirmed this by relating job title *segregation* to job title proliferation. Indices of dissimilarity for race and sex were computed over job titles in job stems and then correlated with the degree of proliferation within stems. Of 1,423 job stems, 677 are perfectly segregated by sex and 539 by race. Among the remaining stems, each type of proliferation exhibits positive and highly significant ( $p \leq .001$ ) partial correlations with job title segregation by sex and race, controlling for the (log) number of workers employed in each stem. For instance, total proliferation exhibits a partial correlation of .25 with gender segregation and .23 with race segregation; for vertical proliferation, the partials are .49 and .15, respectively. These results show that within lines of work performed by both sexes or by whites and nonwhites, proliferation by rank, functional specialty, or organizational location produce job categories that are more segregated than is the job stem as a whole.

Race and gender segregation has profound consequences. Previous research suggests that job title proliferation within mixed work roles may help high-status incumbents preserve status and intragroup solidarity (Wharton and Baron 1987). These distinctions also have economic significance—other analyses of California civil service jobs document strong negative effects of percent female and percent nonwhite in a job title on the prescribed pay rate, even within very detailed lines of work (Baron and Newman 1989). Our findings are thus consistent with other work reporting substantial ascriptive job segregation and pay stratification in occupations that appear, from aggregate statistics, to be integrated (Bielby and Baron 1986; Strober and Arnold 1987; Tienda and Ortiz 1987; Reskin 1988; Konrad and Pfeffer, forthcoming).

It has been noted that "occupation" and "organization" can serve as competing bases for structuring and controlling work (e.g., Kalleberg and Lincoln 1988). The definition of job categories is one context in which this competition occurs. We hypothesized that job title proliferation should be less prevalent in occupations that enjoy the power and status associated with craft unionism and professional standing. The results for unionization are generally

consistent with our predictions: industrial unions favor detailed subdivisions of labor and craft unions resist them. When we categorize work roles very broadly, professional lines of work do not stand out as expected. However, examination of a subset of predominantly white-collar occupations that vary along dimensions of professional standing suggests that this is because several conflicting influences are at work. Job title proliferation is least prevalent in work roles characterized by high prestige and specialized training requirements, two characteristics that help distinguish the established professions from aspiring ones. The established professions presumably resist elaborate job structures in California state government because those structures provide an alternative system of organizational control that threatens professional autonomy and hegemony. The more detailed the job title, the more easily personnel authorities can define the content of work and inspect job occupants moving within state agencies.

On the other hand, professional unions in the civil service appear to have embraced vertical distinctions to widen pay ranges and subsume managerial and administrative duties within kindred titles. Moreover, among occupations with equal prestige and training requirements, those with credentialing requirements exhibit greater lateral proliferation. This may reflect the fact that professional credentialism often occurs in occupations whose professional status is less accepted, and where formalization may enhance occupational claims. In these cases, credentialism goes hand in hand with a detailed subcategorization of jobs as a strategy for restricting access and garnering power for incumbents. In sum, our results for unionization and professional standing underscore how the collective organization and privileged social standing of occupations provide workers with the capacity to shape the division of labor.

Job title proliferation is also strongly related to several aspects of the organizational context of work, including when the line of work was introduced into the California civil service and the number and size of agencies in which the work role appears. There is less job title proliferation in lines of work that are "younger," concentrated in large organizations, and prevalent throughout state government. While these results might appear counter-intuitive, we suggest that they are illuminated by the notion of *rationalization*. In California state government,

rationalization has involved attempts by state agencies — and, perhaps more importantly, by central personnel authorities — to streamline the job classification system, eliminating idiosyncratic positions and creating a simple, standard job title structure. It seems plausible that these rationalization efforts have been more extensive in larger organizations; in generic or “service-wide” lines of work; and in recently created civil service occupations.<sup>16</sup>

At first blush, these findings may seem inconsistent with Weber’s treatment of bureaucracy, especially given its emphasis on the expansion of a detailed division of labor and extended hierarchy of offices. However, rationalization is also at the core of a Weberian understanding of bureaucratization. The California civil service illustrates how bureaucratization sometimes proceeds by *lessening* formal horizontal and vertical divisions of labor, unifying and consolidating activities and roles.

Our data do not permit us to assess the technical efficiency of various job title structures, nor have we systematically contrasted technical with social and political imperatives. Yet while compelling efficiency rationales can explain some of our results (such as greater proliferation among administrators and highly paid positions generally), other findings are not so easily interpreted in efficiency terms. For instance, after controlling for the number of incumbents in a work role, it is not clear why extensive job title specialization would be technically superior in small organizations, in old lines of work, in occupations with a particular mix of male and female (or white and non-white) incumbents, or in occupations lacking prestige and specialized training. These relationships begin to make sense, however, when

<sup>16</sup> Over the last decade, the state has delegated many personnel functions to individual agencies. A state agency can now do its own testing for a position and create its own list of eligible candidates, *but only if it is the sole agency employing that job class*. If the job title appears in several agencies, each agency draws from the common list of candidates, allowing agencies to cannibalize one another’s talent pools. According to state personnel officials, this has created an incentive to proliferate agency-specific titles in work roles that span several agencies. This incentive is presumably greatest for job stems concentrated in small agencies, which are hurt most by inter-agency “raiding.” We are indebted to Brian Mittman for noting this development, which may help explain our findings regarding agency size and diversity.

we think of job definitions as shaped by more than purely technical considerations.

Further, efficiency rationales for job title proliferation generally focus on its role in creating pay distinctions within a given line of work, in order to create promotion incentives (e.g., Milgrom and Roberts 1988) and to reflect differences in job responsibilities, labor market conditions, human capital investments, and the like (e.g., Rosen 1983). We found some evidence consistent with these accounts — for instance, greater vertical proliferation in highly paid occupations and occupations represented by professional unions. Yet many of the factors affecting vertical proliferation — such as the gender composition, organizational context, and founding period of work roles — had similar effects on functional and organization-specific proliferation within stems (and on stem proliferation within occupations). These dimensions of proliferation generally have little, if anything, to do with pay distinctions in the civil service context. In short, the use of job title distinctions to facilitate pay differentiation is certainly part, but by no means all, of the story.

By documenting how demography, the power and status of occupational groups, and organizational settings interact in shaping job structures, this paper contributes to a burgeoning literature on systems of workplace control and how they are shaped by competing interests inside and outside organizations (Pfeffer 1989). Since our analysis is cross-sectional and restricted to a single civil service system, caution is warranted in drawing generalizations and causal inferences. However, our findings are consistent with other recent research. Baron and Bielby’s (1986) cross-sectional and longitudinal analyses, based on a sample of mostly small, private sector organizations, yielded similar results. The social, cultural, and political bases of personnel matters have also been documented in recent studies of other civil service systems. Bridges and Nelson (1989), for example, demonstrate how gender, political interests, and structural inertia interact to shape job classifications and the linkages among jobs for pay purposes in the Washington state civil service. DiPrete (1989) provides a similar historical portrait of the Federal civil service, noting also how prevailing beliefs about professional work shaped the contours of the Federal job classification system. Hopefully, future research will examine other organizational contexts and trace the evolution of job structures over time. to

gauge the generalizability of our findings and speculations about causality.

The division of labor is receiving increasing attention from academics, practitioners, and policy-makers alike, especially given recent attention to comparable worth and the job structures of Japanese organizations (Lincoln and McBride 1987). All audiences will gain, categorically, from future research examining the social, political, and historical forces that shape how jobs are defined and structured.

*DAVID STRANG is Assistant Professor in the Department of Sociology, University of Iowa. His work focuses on institutional change in organizations, national politics, and the world system. His dissertation research investigated conditions leading to global decolonization. Current research projects examine the emergence of health maintenance organizations, cross-national variations in welfare programs, and the application of event history methods to the analysis of diffusion processes.*

*JAMES N. BARON is Professor of Organizational Behavior and Business School Trust Faculty Fellow for 1990-1991 in the Graduate School of Business, and Professor of Sociology at Stanford University. He is currently writing a book on organizations and inequality (with Jeffrey Pfeffer); studying how structural and social psychological dimensions of the workplace influence career outcomes among California state civil servants (with Nancy Durbin and Nancy Tuma); and doing participant-observation research on stress among dual-career couples with young children (with Mary T. Dumont).*

#### REFERENCES

- Baron, James N., and William T. Bielby. 1986. "The Proliferation of Job Titles in Organizations." *Administrative Science Quarterly* 31:561-86.
- Baron, James N., Brian S. Mittman, and Andrew E. Newman. Forthcoming. "Targets of Opportunity: Organizational and Environmental Determinants of Gender Integration in the California Civil Service, 1979-1985." *American Journal of Sociology*.
- Baron, James N., and Andrew E. Newman. 1989. "Pay the Man: Effects of Demographic Composition on Wage Rates in the California Civil Service." Pp. 107-30 in *Pay Equity: Empirical Inquiries*, edited by Robert T. Michael, Heidi I. Hartmann, and Brigid O'Farrell. Washington DC: National Academy Press.
- Baron, James N., and Jeffrey Pfeffer. Unpublished. "The Social Psychology of Organizations and Inequality." Graduate School of Business, Stanford University.
- Becker, F. M. 1934. *Administration of the Personnel Program in the State of California*. Sacramento: State of California Archives (Administration; Personnel Board — Historical).
- Bielby, William T., and James N. Baron. 1986. "Men and Women at Work: Sex Segregation and Statistical Discrimination." *American Journal of Sociology* 91:759-99.
- Bielby, William T., and Denise D. Bielby. 1989. *The Hollywood Writers Report, 1989 Update*. West Hollywood, CA: Writers' Guild of America, West.
- Blau, Peter, and Richard A. Schoenherr. 1971. *The Structure of Organizations*. New York: Basic.
- Bridges, William P. and Robert L. Nelson. 1989. "Markets in Hierarchies: Organizational and Market Influences on Gender Inequality in a State Pay System." *American Journal of Sociology* 95:616-58.
- Conk, Margo A. 1978. "Occupational Classification in the United States Census: 1870-1940." *Journal of Interdisciplinary History* 9:111-30.
- DiPrete, Thomas A. 1989. *The Bureaucratic Labor Market*. New York: Plenum.
- Edwards, Richard C. 1979. *Contested Terrain*. New York: Basic.
- Epstein, Cynthia F. 1988. *Deceptive Distinctions*. New Haven and New York: Yale University Press and Russell Sage Publications.
- Fanning, Dierdre. 1990. "Top Talent Tires of the Titillation of Titles." *New York Times*, January 21 (Section 3, Part 2): 29.
- Friedson, Eliot. 1984. "The Changing Nature of Professional Control." *Annual Review of Sociology* 10:1-20.
- Gordon, David M. 1972. *Theories of Poverty and Underemployment*. Lexington, MA: D. C. Heath.
- Hannan, Michael T. and John M. Freeman. 1984. "Structural Inertia and Organizational Change." *American Sociological Review* 49:149-64.
- Hauser, Robert M. and David L. Featherman. 1977. *The Process of Stratification*. New York: Academic.
- Jamous, H. and B. Peloille. 1970. "Professions or Self-perpetuating Systems?: Changes in the French University-Hospital System." Pp. 109-52 in *Professions and Professionalization*, edited by John A. Jackson. Cambridge: University Press.
- Kalleberg, Arne L. and James R. Lincoln. 1988. "The Structure of Earnings Inequality in the United States and Japan." *American Journal of Sociology* 94 (Supplement): S121-S153.
- Konrad, Alison and Jeffrey Pfeffer. Forthcoming. "Understanding the Hiring of Women and Minorities: How Gender and Ethnic Segregation is Produced and Reproduced in Organizations." *Sociology of Education*.
- Larson, Magdali S. 1977. *The Rise Of Professionalism: A Sociological Analysis*. Berkeley: University of California Press.
- Lincoln, James R. and Kerry MacBride. 1987. "Japanese Industrial Organization in Comparative Perspective." *Annual Review of Sociology* 13:289-



- 312.
- Maddala, G.S. 1983. *Limited-dependent and Qualitative Variables in Econometrics*. Cambridge: Cambridge University Press.
- Messick, David M. and Diane M. Mackie. 1989. "Intergroup Relations." *Annual Review of Psychology* 40:45-81.
- Meyer, John W. and Brian Rowan. 1977. "Institutionalized Organizations: Formal Structure as Myth and Ceremony." *American Journal of Sociology* 83:340-63.
- Meyer, John W., W. Richard Scott, and David Strang. 1987. "Centralization, Fragmentation, and School District Complexity." *Administrative Science Quarterly* 32:186-201.
- Meyer, Marshall W. and M. Craig Brown. 1977. "The Process of Bureaucratization." *American Journal of Sociology* 83:364-85.
- Miner, Anne S. 1987. "Idiosyncratic Jobs in Formalized Organizations." *Administrative Science Quarterly* 32:327-51.
- Milgrom, Paul and John Roberts. 1988. "An Economic Approach to Influence Activities in Organizations." *American Journal of Sociology* 94 (Supplement): S154-S179.
- Oi, Walter Y. 1983. "Heterogeneous Firms and the Organization of Production." *Economic Inquiry* 21:147-71.
- Pfeffer, Jeffrey. 1989. "A Political Perspective on Careers: Interests, Networks, and Environments." Pp. 380-96 in *Handbook of Career Theory*, edited by Michael B. Arthur, Douglas T. Hall, and Barbara S. Lawrence. Cambridge: Cambridge University Press.
- Piore, Michael J. 1982. "American Labor and the Industrial Crisis." *Challenge* 25:5-11.
- Pugh, Derek S., David J. Hickson, and C. R. Hinings. 1969. "An Empirical Taxonomy of Structures of Work Organizations." *Administrative Science Quarterly* 14:115-26.
- Reskin, Barbara F. 1988. "Bringing the Men Back In: Sex Differentiation and the Devaluation of Women's Work." *Gender and Society* 2:58-81.
- Reskin, Barbara F. and Irene Padavic. 1988. "Supervisors as Gatekeepers: Male Supervisors' Response to Women's Integration in Plant Jobs." *Social Problems* 35:536-50.
- Rosen, Sherwin. 1983. "Specialization and Human Capital." *Journal of Labor Economics* 1:43-9.
- Scott, W. Richard. 1987. *Organizations: Rational, Natural, and Open Systems*. Englewood Cliffs, NJ: Prentice-Hall.
- Stinchcombe, Arthur L. 1965. "Social Structure and Organizations." Pp. 142-93 in *Handbook of Organizations*, edited by James G. March. Chicago: Rand McNally.
- Strober, Myra M. and Carolyn L. Arnold. 1987. "The Dynamics of Occupational Segregation Among Bank Tellers." Pp. 107-48 in *Gender in the Workplace*, edited by Clair Brown and Joseph A. Pechman. Washington DC: Brookings Institution.
- Tienda, Marta and Vilma Ortiz. 1987. "Intra-Industry Occupational Recomposition and Gender Inequality in Earnings." Pp. 23-51 in *Ingredients for Women's Employment Policy*, edited by Christine Bose and Glenna Spitze. Albany, NY: SUNY Press.
- Wharton, Amy S. and James N. Baron. 1987. "So Happy Together? The Impact of Gender Segregation on Men at Work." *American Sociological Review* 52:574-87.
- Wilensky, Harold. 1964. "The Professionalization of Everyone?" *American Journal of Sociology* 70:137-58.
- Williamson, Oliver E. 1975. *Markets and Hierarchies*. New York: Free Press.