

Faculty Workload and Productivity: Gender Comparisons

by *Henry L. Allen*

Henry L. Allen is an associate professor of sociology at the Rochester Institute of Technology. He continues his work on several articles explaining the structure and dynamics of academic systems, using mathematical models.

Allen's current research interests include mathematical sociology, the sociology of higher education, academic labor markets, and the academic professions.

The rapid entry rate of women into the nation's professoriate during the past decade gives gender a special place among categories of academic diversity.¹ Between 1989-90 and 1991-92, the number of women employed at the rank of instructor or above increased from 246,992 to 300,653.² In fall 1992, 37 percent of all faculty and instructional staff (327,264) were women.³

While these numbers suggest women have met with some success in their efforts to enter the professoriate, parity remained elusive.⁴ Studies show that male and female faculty still work in different disciplines, ranks, and institutions.⁵ Women faculty are more likely to be part-time employees, hold lower academic ranks, work at undergraduate teaching institutions, and pursue careers in traditional fields. Women also receive fewer professional rewards, are less likely to hold tenure, publish fewer refereed articles, and receive disproportionately lower salaries for all ranks and types of institutions in 1995-96.

Patterns of prioritizing teaching, research, and service are also gender-related, and the nontraditional perceptions of academic roles held by women suggest that gender may define the dimensions of academic work in the future.⁶

Determining the reasons for these differences between male and female faculty in academic labor markets is problematic. We cannot equate gender differentiation with discrimination without documenting the organizational processes mediating gender differentiation—processes not easily delineated by statistical surveys. Such organizational research remains inconclusive. Some studies target the accumulated advantages arising from different opportunity structures; others focus on differences in socialization.⁷ But neither explanation incorporates the role of organizations.

We await a theory that integrates disparate empirical findings.⁸ The data in this chapter do not show cause and effect. Instead, this chapter offers a preliminary examination of gender differences in faculty workload and productivity.

The 1993 National Study of Postsecondary Faculty (NSOPF-93) permits us to trace the distribution of women among institutions, academic ranks, and disciplines. These distributions provide a context for interpreting differentiation by gender in workload—measured by length of the workweek and time

allocated to different activities—and productivity, using multiple measures. The chapter then provides a multivariate analysis of survey data on faculty workload and productivity. It also discusses the theoretical, methodological, policy, and practical implications of the data for further study of gender differences within the academic professions.

DESCRIPTIVE FINDINGS

How are women faculty members distributed within American colleges and universities? NCES data provide several types of distributions.⁹

TABLE 1

PERCENTAGE OF FEMALE FACULTY IN EACH EMPLOYMENT STATUS, BY TYPE AND CONTROL OF INSTITUTION, FALL 1992		
Institutional Type	Percent Part-time	Percent Full-time
All Institutions	44.6	32.5
Public Research	43.1	22.8
Independent Research	41.3	30.0
Public Doctoral	44.4	29.2
Independent Doctoral	36.7	23.1
Public Comprehensive	51.1	33.5
Independent Comprehensive	43.5	34.5
Independent Liberal Arts	54.2	39.1
Public Two-Year	43.2	44.6
Other	43.1	26.3

SOURCE: Zimble, 1994, Tables 6 and 7, 14-17.

Table 1 shows the distribution of women faculty members by employment status among types of colleges and universities in fall 1992. Full-time women faculty members—one third of the total—were concentrated in public community colleges, independent liberal arts colleges, and independent and public comprehensives. Concentrations were lower at research and doctoral universities—less than one quarter of full-time professors at public research and independent doctoral universities were female.

Nearly 45 percent of all part-time faculty

members were female—a disproportionate representation in part-time roles (Table 1). Male and female part-timers were distributed at near-parity only in independent liberal arts colleges (women=54.2 percent), and public comprehensives (women=51.1 percent). Public institutions showed higher proportions of part-time women faculty than independents, except for liberal arts colleges.

TABLE 2

PERCENTAGE OF FEMALE FACULTY IN EACH EMPLOYMENT STATUS, BY ACADEMIC RANK, FALL 1992

Academic Rank	Percent Part-time	Percent Full-time
Not Applicable	51.4	42.4
Full Professor	27.9	16.2
Associate Professor	33.8	28.7
Assistant Professor	42.6	42.5
Instructor	47.1	47.7
Lecturer	45.7	61.9
Other	51.7	47.7

SOURCE: Zimble, 1994, Tables 6 and 7, 14-17.

Table 2 gives the percentage of part- and full-time female faculty by academic rank. Women faculty were disproportionately concentrated in the bottom ranks—lecturers, instructors, and below; large percentages reported no rank or nontraditional ranks. Over half of all part-time faculty without rank were female. Among full-timers, only 16.2 percent of full professors, 28.7 percent of associate professors, and 42.5 percent of assistant professors were women. The modal rank for full-time male faculty, in contrast, was full professor. These distributions suggest a continued marginal status for women faculty, since higher ranks accrue power and prestige.

Table 3 displays the gender distribution of faculty members across disciplines. The disciplines with the largest percentages of full-time women professors were nursing (98.4 percent), teacher education (56.3 percent), foreign languages (51.4 percent), English plus literature (50.2 percent), and education-all (50.1 percent).

TABLE 3

PERCENTAGE OF FEMALE FACULTY IN EACH EMPLOYMENT STATUS, BY ACADEMIC DISCIPLINE, FALL 1992		
Academic Discipline	Percent Part-time	Percent Full-time
Agriculture and Home Economics	51.2	23.8
Business	30.2	30.1
Communications	52.8	34.1
Education	67.3	50.1
Teacher Education	76.8	56.3
Other Education	60.8	46.9
Engineering	8.3	5.9
Fine Arts	48.4	32.2
Health Sciences	57.0	49.5
First Professional	30.5	22.5
Nursing	94.3	98.4
Other Health Sciences	60.7	47.8
Humanities	58.8	40.8
English and Literature	66.8	50.2
Foreign Languages	64.0	51.4
History	30.9	23.0
Philosophy	26.5	13.1
Law	25.8	34.7
Natural Sciences	32.4	19.6
Biological Sciences	43.3	23.2
Physical Sciences	23.8	11.3
Mathematics	36.8	24.4
Computer Sciences	21.2	19.4
Social Sciences	42.9	26.9
Economics	17.4	14.9
Political Science	18.6	17.0
Psychology	48.4	37.0
Sociology	56.2	24.6
Other Social Sciences	44.1	30.9
Occupationally Specific Programs	18.3	15.1
All Other Programs	48.3	34.8

SOURCE: Zimble, 1994, Tables 6 and 7, 14-17.

The disciplines with the lowest percentages of full-time women faculty were engineering (5.9 percent), the physical sciences (11.3 percent), and philosophy (13.1 percent). Occupational programs, political science, economics, computer science, and the natural sciences also reported less than 20 percent.

Among part-time faculty, nursing (94.3 percent), teacher education (76.8 percent), English plus literature (66.8 percent) and foreign languages (64 percent) had the highest percentage of women. Sociology (56.2 percent), other health sciences (60.7 percent), health sciences-all (57 percent), and communications (52.8 percent) followed. Only engineering had single-digit percentages of part-time *and* full-time female faculty members. Nearly all disciplines showed a greater percentage of women among part-timers; business was the exception. These data further attest to the marginal status of many women faculty.

Did some disciplines rely disproportionately on part-time female faculty? We may construct an index of dissimilarity by subtracting the gender distribution of part-timers from the distribution of full-timers for each discipline. Assume that a positive figure denotes a bias toward full-time employment, and that a negative sign indicates a bias toward part-time work. The closer the index is to zero, the greater the parity between men and women professors, though we may not draw conclusive inferences without probability estimates.

TABLE 4

INDEX OF DISPARITY BETWEEN THE EMPLOYMENT STATUSES OF FEMALE FACULTY, BY TYPE AND CONTROL OF INSTITUTION, FALL 1992		
Institutional Type	Index*	Skew
All Institutions	-12.1	PT
Public Research	-20.3	PT
Independent Research	-11.3	PT
Public Doctoral	-15.2	PT
Independent Doctoral	-13.6	PT
Public Comprehensive	-17.6	PT
Independent Comprehensive	-9.0	PT
Independent Liberal Arts	-15.1	PT
Public Two-Year	1.4	FT
Other	-16.8	PT

* This index was calculated from the data listed in Table 1 by subtracting the percent of part-time women faculty from the percent of full time women faculty. If the former is larger, the sign is negative. The column labeled "skew" indicates the employment status in which the largest percentages of women were likely to be found at each type of institution. It is used here for heuristic purposes only.

Table 4 measures the disparity between full-time and part-time female faculty at each type of institution. The gap, favoring part-time employment for women faculty, is greatest at public research universities—about 20 percent. Public community colleges—the only type of institution to show a prevalence of full-time women faculty—showed near-parity. Only community colleges, independent comprehensives, and independent research universities showed smaller disparities than the percentage for all institutions. These disparities suggest that the distribution of female faculty was skewed disproportionately toward part-time status.

TABLE 5

INDEX OF DISPARITY BETWEEN THE EMPLOYMENT STATUSES OF FEMALE FACULTY, BY ACADEMIC RANK, FALL 1992

Academic Rank	Index*	Skew
Not Applicable	-9.0	PT
Full Professor	-11.7	PT
Associate Professor	-5.1	PT
Assistant Professor	-0.1	PT
Instructor	0.6	FT
Lecturer	16.2	FT
Other	-4.0	PT

* This index was calculated from the data listed in Table 2 by subtracting the percent of part-time women faculty from the percent of full-time women faculty. If the former is larger, the sign is negative. The column labeled "skew" indicates the employment status in which the largest percentages of women were likely to be found at each type of institution. It is used here for heuristic purposes only.

Table 5 shows a similar measure for academic rank. The modal ranks for women were full-time lecturer, followed by instructor. The lecturer rank was skewed toward full-time employment. There was little disparity between full-time and part-time faculty members among assistant professors. The -11.9 percent discrepancy among full professors reflected a concentration of women in part-time positions. Academic rank and the distribution of women faculty thus showed an inverse relationship: the higher the rank the

more likely women faculty were employed as part-timers.

TABLE 6

INDEX OF DISPARITY BETWEEN THE EMPLOYMENT STATUSES OF FEMALE FACULTY, BY ACADEMIC DISCIPLINE, FALL 1992

Academic Discipline	Index*	Skew
Agriculture and Home Economics	-27.4	PT
Business	-0.1	PT
Communications	-18.7	PT
Education	-17.2	PT
Teacher Education	-20.5	PT
Other Education	-13.9	PT
Engineering	-2.4	PT
Fine Arts	-16.2	PT
Health Sciences	-7.5	PT
First Professional	-8.0	PT
Nursing	4.1	FT
Other Health Sciences	-12.9	PT
Humanities	-18.0	PT
English and Literature	-16.6	PT
Foreign Languages	-12.6	PT
History	-7.9	PT
Philosophy	-13.4	PT
Law	8.9	FT
Natural Sciences	-12.8	PT
Biological Sciences	-20.1	PT
Physical Sciences	-12.5	PT
Mathematics	-12.4	PT
Computer Sciences	-1.8	PT
Social Sciences	-16.0	PT
Economics	-2.5	PT
Political Science	-1.6	PT
Psychology	-11.4	PT
Sociology	-31.6	PT
Other Social Sciences	-13.2	PT
Occupationally Specific Programs	-3.2	PT
All Other Programs	-13.5	PT

* This index was calculated from the data listed in Table 1.3 by subtracting the percent of part-time women faculty from the percent of full-time women faculty. If the former is larger, the sign is negative. The column labeled "skew" indicates the employment status in which the largest percentages of women were likely to be found at each type of institution. It is used here for heuristic purposes only.

Table 6 measures the disparity between full-time and part-time female faculty by discipline. Sociology (-31.6) and agriculture/home economics (-27.4) showed the greatest gap between full- and part-timers. Business (-0.1), political science (-1.6), computer science (-1.8), and engineering (-2.4) showed the smallest disparities. Only nursing and law showed a skew towards full-time roles.

These data suggest wide variation in the norms and practices among disciplines affecting the employment of women. Research is needed to identify the organizational aspects of colleges and universities that affect their career opportunities. Does the ratio of full-time to part-time employment among women faculty, for example, affect their productivity within, as well as across, types of institutions, academic ranks, and disciplines?

GENDER AND WORKLOAD

Gender distributions within employment statuses, academic ranks, fields of study, and institutions influenced faculty workload, measured by length of workweek (averages: men=48.4 hours; women=40.1 hours), across all types of colleges and universities in fall 1992.¹⁰ Male full-timers, in regular and temporary positions, worked 55 hours; women in these categories invested 52 hours and 48.1 hours of their time respectively. Among part-time faculty, men with regular positions worked 38.4 hours; women worked 30 hours per week.¹¹ Faculty members with temporary appointments worked similar schedules (men=34.8 hours; women=33.8 hours).

Table 7 compares the workweeks of male and female faculty across institutions.¹² For both sexes, the total hours worked were slightly longer in research and doctoral institutions than elsewhere. But men worked longer workweeks than women in all types of institutions. Independent research universities—the category showing the greatest gender disparity between full- and part-time faculty—also showed the largest workweek disparity. Community colleges showed the smallest differences in workweek and in employment status.

Table 8 shows the proportion of time allocated to key professional duties by gender. Women faculty in all categories devoted large proportions of their professional time to instruction. Among full-time regulars, women gave 47

TABLE 7

GENDER DIFFERENCES IN FACULTY WORKLOAD (TOTAL HOURS WORKED), BY TYPE AND CONTROL OF INSTITUTION, NSOPF-93

Institutional Type	Male	Female
Public Research	54.9	50.2
Independent Research	54.2	47.2
Public Doctoral	52.5	48.0
Independent Doctoral	49.5	45.3
Public Comprehensive	49.4	44.1
Independent Comprehensive	46.2	42.0
Independent Liberal Arts	48.0	43.3
Public Two-Year	39.2	36.3
Other	45.2	41.3

SOURCE: NSOPF-93.

percent of their time to teaching, 18 percent to research, and 29 percent to administration and service. Men devoted only 41 percent of their time to teaching, but gave 27 percent of their time to research.¹³ Women in full-time, temporary positions devoted 51 percent of their time to teaching, 17 percent to research, and 27 percent to administration and service. Men in this category allocated 40 percent of their time to instruction and 28 percent to research.

Among part-timers with regular positions, women gave 58 percent of their time to teaching; men reported 50 percent. But men and women part-time faculty members with temporary positions showed only a 1 percent difference in the proportion of time devoted to teaching. Other differences in time allocation were modest, though men were more likely to allocate time to research.

Table 9 lists the total hours per week for male and female professors by field of inquiry.¹⁴ The amount of time male and female academics worked per week varied by discipline, but men had longer workweeks in every field: 55 hours in agriculture/home economics; 50 hours or more in health sciences, engineering, and the social sciences, and at least 46 hours in 9 out of the 10 measured areas; the humanities were the exception at 43 hours. Women, in contrast, worked at least 46 hours only in engineering (47 hours) and health sciences (46 hours). Women in the fine arts (35 hours), humanities (38 hours), and natural

TABLE 8

GENDER DIFFERENCES IN FACULTY WORKLOAD (PERCENT OF TIME ALLOCATED TO DUTIES), BY EMPLOYMENT STATUS, NSOPF-93			
Employment Status	Male	Female	
Full-Time, Regular			
Percent time in teaching	41	47	
Percent time in research	27	18	
Percent time in professional growth	5	6	
Percent time in administration	15	15	
Full-Time, Temporary			
Percent time in teaching	40	51	
Percent time in research	28	17	
Percent time in professional growth	4	5	
Percent time in administration	14	18	
Part-Time, Regular			
Percent time in teaching	50	58	
Percent time in research	10	8	
Percent time in professional growth	4	5	
Percent time in administration	14	18	
Part-Time, Temporary			
Percent time in teaching	56	57	
Percent time in research	10	7	
Percent time in professional growth	4	7	
Percent time in administration	7	6	

SOURCE: NSOPF-93.

NOTE: Figures have been rounded off.

sciences (39 hours) had the shortest workweeks. Table 9 shows considerable overlap between total hours reported by men in disciplines with shorter workweeks and women in fields with longer workweeks.

Did age, a proxy for years of professional experience, account for the length of the workweek? Table 10 provides data on gender differences within age categories. All faculty members worked long hours, but in every age cohort, male faculty worked longer workweeks than females. The gap was greatest among faculty 60–64 years old, but younger faculty also showed gaps of seven or more hours. Men worked 50 hours or more in four of the six age gradations. All age categories of women faculty members, except the over-60 groups, worked between 40 and 43 hours.

TABLE 9

GENDER DIFFERENCES IN FACULTY WORKLOAD (TOTAL HOURS WORKED), BY ACADEMIC DISCIPLINE, NSOPF-93			
Academic Discipline	Male	Female	
Agriculture/Home Economics	55.3	42.3	
Business	47.4	40.3	
Education	47.2	39.7	
Engineering	50.3	47.4	
Fine Arts	47.2	35.0	
Health Sciences	53.3	46.1	
Humanities	42.9	38.1	
Natural Sciences	48.8	39.3	
Social Sciences	50.4	41.8	
Other	46.1	39.9	

SOURCE: NSOPF-93.

TABLE 10

GENDER DIFFERENCES IN FACULTY WORKLOAD (TOTAL HOURS WORKED), BY AGE COHORT, NSOPF-93			
Age Cohort	Male	Female	
Under 30	53.3	43.4	
30–44	50.1	41.1	
45–54	49.6	43.3	
55–59	46.7	40.0	
60–64	49.4	32.2	
65 or older	38.7	30.0	

SOURCE: NSOPF-93.

Did differences in academic rank explain the gender disparity in workweeks? Save for lecturers (men=39.4 hours; women=42.3 hours), men worked more total hours per week at each academic rank (Table 11). Male full and assistant professors each worked an average of 54 hours. No rank of female professors exceeded a 50-hour workweek. The gender disparity was negligible for associate professors.

Men allocated more time on average to their academic work. The pattern persisted across academic institutions, ranks, discipline,

TABLE 11

GENDER DIFFERENCES IN FACULTY WORKLOAD (TOTAL HOURS WORKED), BY ACADEMIC RANK, NSOPF-93		
Rank	Male	Female
Not Applicable	40.2	36.7
Full Professor	54.0	48.4
Associate Professor	51.3	50.1
Assistant Professor	54.3	47.6
Instructor	40.4	32.6
Lecturer	39.4	42.3
Other	46.8	40.6

SOURCE: NSOPF-93.

and age, so no one variable accounts for this finding. Uncovering the factors influencing gender differences in workweeks requires multivariate analysis—comparing men and women in the same rank, discipline, and institutional location. Organizational and ecological variables, or processes such as mentorship or sponsorship—not examined by NSOPF-93—may be at work.

How did male and female faculty members divide their time among their duties? Women devoted slightly more time to teaching than men in most types of institutions (Table 12). The largest gap in time devoted to teaching—6 percent—occurred among professors at public comprehensive institutions. The differences in teaching were negligible at independent research and public doctoral universities.

The gender gap appeared in data on age, rank, and discipline. Women spent more time teaching at all ranks, except associate professor, and all disciplines, except business.¹⁵ Time spent teaching by women varied considerably by age. Women over 60 spent 70 percent of their time on teaching. Women under 30 only 39 percent.

Conversely, males at every rank, discipline, type of institution and age cohort—except men under 30—gave more time to research. The disparity was most pronounced at independent research universities. This pattern may change as younger women devote more time to research.¹⁶

TABLE 12

GENDER DIFFERENCES IN FACULTY WORKLOAD (PERCENT OF TIME ALLOCATED TO DUTIES), BY INSTITUTIONAL TYPE, NSOPF-93		
Type of Institution	Male	Female
Public Research		
Percent time in teaching	35	40
Percent time in research	34	25
Percent time in professional growth	4	5
Percent time in administration	14	13
Independent Research		
Percent time in teaching	31	30
Percent time in research	37	21
Percent time in professional growth	3	11
Percent time in administration	13	13
Public Doctoral		
Percent time in teaching	47	46
Percent time in research	21	17
Percent time in professional growth	6	6
Percent time in administration	12	9
Independent Doctoral		
Percent time in teaching	31	35
Percent time in research	17	14
Percent time in professional growth	5	5
Percent time in administration	13	10
Public Comprehensive		
Percent time in teaching	54	60
Percent time in research	14	11
Percent time in professional growth	5	6
Percent time in administration	14	17
Independent Comprehensive		
Percent time in teaching	55	60
Percent time in research	9	6
Percent time in professional growth	5	6
Percent time in administration	12	11
Independent Liberal Arts		
Percent time in teaching	57	62
Percent time in research	11	8
Percent time in professional growth	5	5
Percent time in administration	16	13
Public Two-Year		
Percent time in teaching	61	65
Percent time in research	4	4
Percent time in professional growth	5	6

TABLE 12 (CONTINUED)

GENDER DIFFERENCES IN FACULTY WORKLOAD (PERCENT OF TIME ALLOCATED TO DUTIES), BY INSTITUTIONAL TYPE, NSOPF-93		
Type of Institution	Male	Female
Percent time in administration	8	8
Other		
Percent time in teaching	56	58
Percent time in research	10	7
Percent time in professional growth	5	6
Percent time in administration	13	11

SOURCE: NSOPF-93.

NOTE: Figures have been rounded off.

GENDER AND PRODUCTIVITY

NSOPF-93 surveyed faculty productivity for the two years preceding data collection and their entire careers. The quality of faculty productivity is usually measured by the number of articles published in refereed journals.¹⁷ By this standard, men were more productive than women in all but one age category: Neither male nor female faculty under 30 averaged a single refereed article in the prior two years. Men averaged two articles in all cohorts. Women in the 30–44, 55–59, and 60–64 age cohorts published an average of one article.

Males in all marital statuses published more often than females over the prior two years. Married males published the most—a two-to-one ratio for married male faculty members without dependents; three-to-one for married males with dependents. Differences were slight for single professors, with and without dependents.

Male faculty also published more frequently than women at every academic rank: full professors—four to two publications; associate and assistant professors—three to two. Publishing activity was negligible for instructors and lecturers, but male lecturers were slightly more likely to publish at least one refereed article.

Neither employment status, tenure status, nor disciplinary affiliation altered the gender disparity observed in faculty productivity over the two years. Tenured and tenure-track males,

for example, averaged three refereed publications each; tenured women, two articles, and tenure-track women, one article. Among non-tenure-track faculty, males published one article to almost none for females; faculty with no tenure barely managed to publish a single refereed article.

Men published more than women in most disciplines with substantial activity—a three to one ratio in agriculture/home economics, natural sciences, health sciences, and engineering; a one to zero ratio in business, humanities, and “other” subjects. Men and women showed equal two-year publication rates in the social sciences (two articles), and in education (one article).

Career publications showed even greater gender disparities. Males under 30 were more likely to have published at least one refereed article; the ratio favored men in the 30–44 age cohort by nine to three. The gender gap in publication widened as age increased: 45–54=18 to 4; 55–59=23 to 5; 60–64=29 to 5; over 65=29 to 4.

This gender disparity appeared in all marital statuses: married faculty members without dependents—a three to one ratio; married males with dependents=20 to 3; single men=2 to 1.¹⁸ Productivity ratios favored men in all employment categories: full-time, regulars=23 to 6; full-time, temporaries=19 to 5; part-time regulars and temporaries=5 to 1. Males also predominated in all tenure statuses: tenured=30 to 11; tenure-track=10 to 4; nontenured and nontenurable: 6 to 1.

The career patterns of faculty productivity also showed gender disparities across disciplines: 33 to 3, for example, in favor of men in agriculture/home economics. Several other disciplines showed wide gender differences: health sciences (25 to 4), natural sciences (27 to 7), engineering (19 to 8), and social sciences (13 to 5). A gender gap also occurred in business (6 to 1), education (7 to 3), the humanities (6 to 2), and “other” (4 to 1). Fine arts was the only exception (2 to 2), but men averaged almost 18 exhibitions in their careers; women averaged 12.

Tables 13 and 14 present NSOPF-93 data on faculty productivity, including two-year and career totals, for men and women across types of colleges and universities. The career totals across the first row indicate male dominance in publishing refereed articles for all types of institutions, except community col-

TABLE 13

**MEAN NUMBER OF ACCOMPLISHMENTS FOR FULL-TIME, REGULAR TEACHERS DURING THEIR CAREERS,
BY TYPE OF INSTITUTION, GENDER, AND PUBLIC INSTITUTIONS**

Accomplishments		Type of Institution							
		Research		Doctoral		Comprehensive		Two-year	
		Male	Female	Male	Female	Male	Female	Male	Female
Articles, Refereed Journals	career	30.89	831	21.02	3.83	6.05	2.88	1.01	0.80
	two-years	3.79	199	2.61	0.87	0.99	0.53	0.14	0.14
Articles, Nonrefereed Journals	career	11.18	393	4.59	1.26	3.96	1.61	0.98	0.90
	two-years	1.33	063	0.68	0.27	0.69	0.34	0.11	0.17
Creative Works, Juried Media	career	0.94	096	0.35	0.45	1.24	0.31	0.47	0.29
	two-years	0.13	019	0.10	0.12	0.13	0.08	0.05	0.06
Creative Works, Nonjuried Media	career	2.46	167	2.16	1.18	2.42	1.47	1.98	3.2
	two-years	0.39	053	0.33	0.28	0.40	0.37	0.35	0.23
Reviews of Books	career	4.10	139	2.86	0.89	2.34	1.59	0.69	1.25
	two-years	0.51	034	0.53	0.25	0.34	0.33	0.09	0.25
Chapters Published	career	2.97	141	1.93	0.67	0.63	0.44	0.11	0.11
	two-years	0.66	046	0.43	0.31	0.15	0.16	0.02	0.03
Textbooks Published	career	0.40	013	0.37	0.12	0.27	0.09	0.10	0.07
	two-years	0.07	005	0.04	0.08	0.06	0.03	0.03	0.02
Books Published	career	0.58	030	0.30	0.09	0.30	0.21	0.12	0.15
	two-years	0.11	012	0.06	0.04	0.07	0.08	0.03	0.03
Monographs Published	career	0.54	025	0.35	0.19	0.39	0.19	0.06	0.02
	two-years	0.08	008	0.08	0.05	0.07	0.04	0.01	0.01
Technical Reports	career	9.94	366	6.13	1.80	6.55	2.80	4.40	1.94
	two-years	1.38	066	0.93	0.42	1.11	0.89	0.71	0.48
Presentations	career	43.15	1842	25.41	13.97	16.05	14.94	8.42	7.66
	two-years	5.53	420	3.50	4.71	2.66	3.68	1.71	1.45
Exhibitions in Fine Arts	career	8.47	1698	11.55	7.68	23.57	15.23	6.86	5.94
	two-years	0.82	176	1.50	3.90	2.12	2.32	0.73	0.69
Patents or Copyrights	career	0.51	049	0.33	0.12	0.38	0.11	0.31	0.39
	two-years	0.09	006	0.06	0.02	0.08	0.03	0.07	0.09
Computer Software	career	0.29	009	0.41	0.08	0.23	0.08	0.51	0.10
	two-years	0.07	004	0.09	0.03	0.06	0.03	0.24	0.03

SOURCE: NSOPF-93.

leges. The data across the second row for the two-year period, for example, shows large gender disparities in productivity at public or independent research and doctoral institutions: public and independent research universities=four to two; public doctorals=two to one; independent doctoral universities=three

to two. Men at public and independent comprehensive universities and at independent liberal arts colleges also published more than women.

For the most part, men published refereed articles more frequently than women, even when employment status, academic rank,

TABLE 14

**MEAN NUMBER OF ACCOMPLISHMENTS FOR FULL-TIME, REGULAR TEACHERS DURING THEIR CAREERS,
BY TYPE OF INSTITUTION, AND BY GENDER, INDEPENDENT INSTITUTIONS**

Accomplishments		Type of Institution									
		Research		Doctoral		Comprehensive		Two-Year		Other	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Articles, Refereed Journals	career	24.63	5.20	13.71	5.01	3.86	1.53	4.01	1.52	6.27	0.81
	two-years	3.61	1.16	3.13	2.03	0.57	0.41	0.60	0.34	0.14	0.14
Articles, Nonrefereed Journals	career	6.62	4.32	2.04	1.32	2.13	0.99	2.70	0.82	3.46	0.59
	two-years	0.95	0.57	0.39	0.42	0.38	0.31	0.41	0.16	0.11	0.17
Creative Works, Juried Media	career	0.62	0.37	0.31	0.18	0.73	0.38	1.51	0.56	0.97	0.62
	two-years	0.11	0.03	0.04	0.11	0.10	0.10	0.16	0.11	0.05	0.06
Creative Works, Nonjuried Media	career	0.94	1.28	0.69	1.29	3.00	2.01	3.05	2.31	2.87	2.37
	two-years	0.23	0.28	0.20	0.28	0.42	0.56	0.52	0.56	0.35	0.27
Reviews of Books	career	3.09	1.17	1.58	0.80	1.35	1.05	3.43	1.40	3.38	1.21
	two-years	0.52	0.16	0.20	0.22	0.20	0.28	0.46	0.25	0.09	0.25
Chapters Published	career	3.28	0.87	2.01	0.64	0.41	0.25	0.73	0.32	0.77	0.47
	two-years	0.71	0.29	0.88	0.18	0.11	0.14	0.21	0.11	0.02	0.03
Textbooks Published	career	0.19	0.15	0.23	0.04	0.14	0.04	0.14	0.05	0.22	0.12
	two-years	0.06	0.04	0.13	0.01	0.06	0.01	0.03	0.02	0.03	0.02
Books Published	career	0.46	0.23	0.24	0.12	0.19	0.13	0.30	0.18	0.46	0.17
	two-years	0.11	0.04	0.08	0.03	0.05	0.04	0.08	0.06	0.03	0.03
Monographs Published	career	0.29	0.14	0.21	0.04	0.30	0.19	0.28	0.08	0.22	0.07
	two-years	0.05	0.04	0.03	0.01	0.06	0.05	0.06	0.02	0.01	0.01
Technical Reports	career	6.49	7.60	5.38	1.97	6.21	2.35	4.86	1.26	6.50	2.97
	two-years	1.05	4.11	0.70	0.31	1.22	0.77	0.66	0.37	0.71	0.45
Presentations	career	28.51	14.70	23.30	13.93	10.81	8.38	13.07	10.77	18.25	9.12
	two-years	4.66	3.36	4.38	3.41	2.19	1.94	1.84	2.14	1.71	1.45
Exhibitions in Fine Arts	career	13.41	1.49	6.70	0.56	18.06	14.97	17.10	21.61	16.42	24.26
	two-years	0.47	0.45	0.45	0.09	2.37	0.74	1.82	2.14	0.73	0.69
Patents or Copyrights	career	0.42	0.06	0.29	0.06	0.23	0.20	0.45	0.12	0.48	0.18
	two-years	0.06	0.02	0.05	0.02	0.08	0.06	0.06	0.02	0.07	0.09
Computer Software	career	0.69	0.04	0.08	0.02	0.35	0.09	0.20	0.14	0.23	0.13
	two-years	0.18	0.02	0.03	0.04	0.12	0.03	0.07	0.05	0.24	0.03

SOURCE: NSOPF-93.

institutional type, disciplinary affiliation, marital status, and age were controlled.¹⁹ But all faculty were productive; those who did not publish refereed articles probably performed other tasks “over and above” normal teaching duties.

What accounts for gender disparities in faculty productivity? Did the sociological structure and dynamics within individuals, groups, and organizations cause these patterned differences? The data suggest investigation of the historical differences in the social organization of career opportunities.²⁰ But an emphasis on individual outcomes obscures these contextual forces.²¹

MULTIVARIATE ANALYSES

How do our findings compare to the determinants of faculty workload and productivity for professors throughout higher education? To move beyond the simple inferences typical of descriptive findings, we conducted multivariate analyses on NSOPF-93 survey data. These analyses used stepwise multiple regression—the conventional statistical technique that assesses the strength of an association between a set of independent and dependent variables and that determines the amount of variance explained by a linear equation that is a function of these variables.

A stepwise multiple regression procedure automatically selects the independent variable explaining the most variance in the dependent variable; it then selects the remaining sequence of variables until all variables satisfying the designated criteria—including statistical significance—are selected.

Tables 15–19 show the results of multiple regression analyses of survey data on faculty workload and productivity. Three key statistics were tabulated:

- The *multiple correlation coefficient* (R) measures the degree of association between an independent and dependent variable. Under stepwise regression, the value of the correlation coefficient increases as each variable is added to the regression equation.
- The *coefficient of determination* (R^2) identifies how much of the total variance in the dependent variable is explained by a particular independent variable.
- The *beta coefficient* (B) measures the magnitude of each independent variable in standard form: the higher the beta weight, the greater the magnitude of the variable.²²

Each table below shows the variance in the dependent variables explained by the independent variables within a regression equation. But first, two caveats. First, regression results are static, not dynamic; they assume that phenomena are subject to linear transformations. Second, scholars usually ignore two key issues when discussing faculty work. The theoretical rationale implicit in selecting the independent and dependent variables is more important than the observed correlation between the variables. And the ability of the researcher to conceptualize the appropriate type and amount of variance is more important than the amount of variance explained.²³ Multiple regression analysis is limited if the included set of variables is deficient.²⁴

Table 15 lists the eight independent variables that significantly affected the number of hours in the faculty workweek. Nearly all these variables, we have shown, were associated with gender disparities in workload.²⁵ Five variables—employment status, institutional type, academic rank, years in current position, and tenure status—were dimensions of organizational status. The other three—age, gender, and race/ethnicity—refer to ascribed statuses. Employment status—the most significant predictor—accounted for 12 percent of the variance in faculty workweeks. The successive variables, beginning with institutional type, had modest effects on workload patterns.

Table 16 lists the eight predictors, mainly organizational, of the proportion of time faculty devoted to teaching. Whether teaching was the principal activity explained 17 percent of the variance, followed by type of institution (8 percent), age, and gender.

Gender is also a predictor of the proportion of time spent in research (Table 17). Type of organization accounted for 15 percent of the variance, followed by highest degree earned—whether a faculty member earned a doctorate. Four of nine significant variables denoted ascribed statuses—age, gender, race/ethnicity, and parents’ education.

Table 18 lists the 11 variables affecting two-year productivity rates, measured by published articles in refereed journals. Six vari-

TABLE 15

**STEPWISE MULTIPLE REGRESSION OF INDEPENDENT VARIABLES INFLUENCING FACULTY WORKLOAD
(TOTAL HOURS WORKED), FALL 1992**

Independent Variables	Multiple Correlation (R)	R ²	Beta
Employment Status	.34	.12	.34
Institutional Type	.36	.13	-.12
Age	.37	.14	-.08
Gender	.37	.14	-.07
Academic Rank	.38	.14	-.06
Race/Ethnicity	.38	.14	-.03
Years in Current Position	.38	.14	-.03
Tenure Status	.38	.14	-.03

SOURCE: NSOPF-93.

p < .05: All variables were statistically significant.

TABLE 16

**STEPWISE MULTIPLE REGRESSION OF INDEPENDENT VARIABLES INFLUENCING FACULTY WORKLOAD
(PERCENT TIME SPENT IN TEACHING), FALL 1992**

Independent Variables	Multiple Correlation (R)	R ²	Beta
Principal Activity	.41	.17	-.41
Institutional Type	.50	.25	.28
Age	.51	.26	.09
Gender	.51	.26	.10
Employment Status	.52	.27	.07
Academic Rank	.52	.27	.04
Tenure Status	.52	.27	-.05
Parents' Education	.52	.27	.01

SOURCE: NSOPF-93.

p < .05: All variables were statistically significant.

ables were organizational—type of institution, academic rank, years in current position, academic discipline (2), and employment status.²⁶ Four ascribed variables—gender, marital status (new in this table), race/ethnicity, and level of parents' education—affected productivity. Highest degree earned was the only achieved status that predicted productivity.

Table 19 shows the 11 factors influencing

career productivity, again measured by published refereed articles. Substituting "age" for "years in current position," the table resembles Table 18. Organizational processes again prevailed: Institutional type, followed by academic rank, were most likely to influence productivity. Five ascribed statuses were significant: age, gender, marital status, parents' education, and race/ethnicity.

TABLE 17

**STEPWISE MULTIPLE REGRESSION OF INDEPENDENT VARIABLES INFLUENCING FACULTY WORKLOAD
(PERCENT TIME SPENT IN RESEARCH), FALL, 1992**

Independent Variables	Multiple Correlation (R)	R ²	Beta
Institutional Type	.39	.15	-.39
Highest Degree Earned	.41	.17	-.13
Age	.42	.18	-.09
Gender	.43	.19	-.09
Academic Discipline-Research	.43	.19	.05
Principal Activity	.44	.19	-.04
Employment Status	.44	.19	.03
Parents' Education	.44	.19	-.03
Race/Ethnicity	.44	.19	-.02

SOURCE: NSOPF-93.

p < .05: All variables were statistically significant.

TABLE 18

**STEPWISE MULTIPLE REGRESSION OF INDEPENDENT VARIABLES INFLUENCING FACULTY PRODUCTIVITY
(REFEREED ARTICLES FOR TWO YEARS), FALL 1992**

Independent Variables	Multiple Correlation (R)	R ²	Beta
Institutional Type	.32	.10	-.32
Academic Rank	.35	.12	-.15
Years in Current Position	.36	.13	-.09
Gender	.37	.14	-.09
Marital Status	.38	.14	.07
Highest Degree Earned	.38	.15	-.07
Race/Ethnicity	.38	.15	-.03
Parents' Education	.38	.15	-.03
Academic Discipline-Research	.38	.15	.02
Employment Status	.39	.15	.02
Academic Discipline-Teaching	.39	.15	-.03

SOURCE: NSOPF-93.

p < .05: All variables were statistically significant.

By itself, survey data cannot determine the impact of context of work, or show how structures, cultures, and processes affect the relationships between variables. But gender was a significant predictor in all multivariate analyses, thus adding weight to the descriptive data

on the relationship of gender to success in academia.

CONCLUSION

All faculty members, NSOPF-93 suggests,

TABLE 19

**STEPWISE MULTIPLE REGRESSION OF INDEPENDENT VARIABLES INFLUENCING FACULTY PRODUCTIVITY
(REFEREED ARTICLES FOR CAREER), FALL 1992**

Independent Variables	Multiple Correlation (R)	R ²	Beta
Institutional Type	.29	.08	-.29
Academic Rank	.38	.14	-.25
Age	.41	.16	.15
Gender	.41	.17	-.09
Marital Status	.42	.18	.06
Parents' Education	.42	.18	-.04
Academic Discipline-Research	.42	.18	.03
Principal Activity	.42	.18	.02
Academic Discipline-Teaching	.42	.18	-.04
Employment Status	.42	.18	-.02
Race/Ethnicity	.42	.18	-.02

SOURCE: NSOPF-93.

p < .05: All variables were statistically significant.

worked long hours and performed demanding tasks. Men and women gave different priorities to their work responsibilities, though many differences were marginal in terms of time and effort. With few exceptions, male faculty, across academic institutions, ranks, disciplines, age cohorts, and marital statuses, worked more hours, spent more time in research than in teaching, and published more frequently than their female colleagues. Conversely, female faculty members worked fewer hours, devoted more time to teaching than research, and published less often in refereed journals.

NSOPF-93 data do not account for these differences.²⁷ But the data *do* show that men, historically dominant in higher education, were more likely to work full-time and that men and women showed different distributions throughout disciplines, ranks, and institutions. Different locales made men and women subject to varying social structures and processes.

Researchers traditionally explain gender disparities in academic work by noting cumulative differences in access, socialization, professional opportunities, mentorship, and sponsorship. But capturing these phenomena requires observations of the dynamics of social

processes. NSOPF-93 was not designed to probe organizational differences affecting faculty workload and productivity. The survey did not examine the intangible, subjective processes that take place within academic departments. These include disparities in such areas as the effectiveness of communication and access to informal support networks.

These processes can also include politically charged negotiations over courses and resources and the need to balance institutional, departmental, and individual preferences or priorities in productivity. Productivity may be more influenced by these external factors than by individual choices.

Our multivariate findings suggest that organizational processes probably account for most gender disparities. These influences, often examined qualitatively, may have greater effects on faculty workload and productivity than measurable determinants. We know little about the dynamics of organizational cultures and normative structures affecting academic work.²⁸

How effectively are resources allocated? How well are other needs met—collegiality, for example? Identifying the determinants of productivity is difficult unless we possess knowledge of markets, investments, attendant trans-

formations, incentives, opportunities, constraints, and individual and group payoffs. Until a theory provides a context, the empirical findings about gender disparities in workload and productivity remain tentative.

NOTES

¹ These comparisons, based upon gender differentiation, are made with statistical aggregations of individual traits, according to the conventions of survey research. We do not infer that these comparisons denote actual group behavior.

² Source: table in Finnegan, Webster, and Gamson, 1996, 3.

³ Men=558,532 (63 percent). See Zimble, 1994., v.

⁴ Billard, 1994.

⁵ Allen, 1997.

⁶ Billard, for example, found discrepancies in publishing opportunities according to gender (Billard, 1993). Men and women faculty, Konrad found, differed in their patterns of productivity. She attributed these differences to segregated roles (Konrad, 1994). For salaries, see Lee, 1997.

⁷ Clark and Corcoran, 1996.

⁸ Kuhn, 1963.

⁹ Total percentages were calculated by adding the percentage distributions across columns for each ethnic category of female faculty.

¹⁰ Tabulations in this chapter were rounded off to the nearest decimal.

¹¹ The National Center for Education Statistics recently adjusted its sampling techniques for part-time faculty in NSOPF-93. The data reported here comes from an earlier data set since I did not have access to the new data.

¹² These institutional strata have been matched with those from an earlier national study, NSOPF-88.

¹³ The percent of time devoted to service activities is not shown.

¹⁴ This raw data analysis does not utilize appropriate statistical controls for years of experience, institutional variation, or other mediating variables. Multivariate results appear later in this chapter.

¹⁵ The distribution of time allocated for teaching duties was at parity for business faculty: Men and women spent 49 percent of their time in instructional activities.

¹⁶ Among faculty in the 30-44 year old cohort, for example, males spent twice the proportion of their time in research as females.

¹⁷ Elsewhere I have written about the conceptualization and measurement problems associated with this indicator. See Allen, 1997. See also Fox, 1996.

¹⁸ But the number of males with dependents was almost three times larger than females of same status.

¹⁹ This conclusion is consistent with earlier findings showing that males invested more time in research than female faculty. NSOPF-93 data on productivity did not take qualitative differences in publishing venues and academic specialties into account.

²⁰ Blalock, 1991.

²¹ Weidlich and Haag, 1983.

²² Gall, Borg, and Gall, 1996.

²³ Kaplan, 1974. Kaplan argued convincingly that the habitual use or *misuse* of statistical techniques is not a viable substitute for substantive thinking about the dimensions of a problem.

²⁴ For example, NSOPF-93 omitted data on many phenomena affecting productivity, including recruitment processes, social networks, the structure and dynamics of social interactions, the structure of opportunities, ideological factors, normative influences, and rates of transformation. The absence of this data limits our inferences.

²⁵ For the implications of ethnic and gender differences upon workload and productivity, see Allen, 1997.

²⁶ NSOPF-93 distinguished between the academic disciplines associated with a professor's research interests and teaching duties to measure possible anomalies.

²⁷ Fox, 1996.

²⁸ Heilman and Hornstein, 1982.

REFERENCES

- Allen, H. L. "Faculty Workload and Productivity: Ethnic and Gender Disparities." In the *NEA 1997 Almanac of Higher Education*. Washington, D.C.: National Education Association, 1997: 25-42.
- Billard, L. "Twenty Years Later: Is There Parity for Academic Women?" *Thought & Action* 10 (spring 1994):115-144.
- _____. "A Different Path into Print." *Academe* 79, no. 3 (May/June 1993): 28-29.
- Blalock, H. M. *Understanding Social Inequality*. Newbury Park, Calif.: Sage, 1991.
- Clark, S. M. and Corcoran, M. "Perspectives on the Professional Socialization of Women Faculty: A Case Accumulative Disadvantage?" Reprinted in *Faculty and Faculty Issues in Colleges and Uni-*

- versities, 2nd ed., eds. D. E. Finnegan, D. Webster, and Z. F. Gamson. Needham Heights, Mass.: Simon and Schuster, 1996: 126-141.
- Finnegan, D. E., Webster, D., and Gamson, Z. F. eds., *Faculty and Faculty Issues in Colleges and Universities*, 2nd ed. Needham Heights, Mass: Simon and Schuster, 1996.
- Fox, M. F. "Publication, Performance, and Rewards in Science and Scholarship." Reprinted in *Faculty and Faculty Issues in Colleges and Universities*, 2nd ed., eds. D. E. Finnegan, D. Webster, and Z. F. Gamson. Needham Heights, Mass.: Simon and Schuster, 1996: 408-428.
- Gall, M. D., Borg, W. R., and Gall, J. P. *Educational Research*, 6th ed. White Plains, N.Y.: Longman, 1996.
- Heilman, M. E., and Hornstein, H. A. *Managing Human Forces in Organizations*, Homewood, Il: Irwin, 1982.
- Kaplan, A. *The Conduct of Inquiry*. New York: Harper and Row, 1975.
- Konrad, A. M. "Faculty Productivity and Demographics." *Thought & Action* 7, no. 2 (1991): 19-54.
- Kuhn, A. *The Study of Society*. Homewood, Il: Dorsey and Irwin, 1963.
- Lee, J. B. "Faculty Salaries, 1995-96." In the *NEA 1997 Almanac of Higher Education*. Washington, D.C.: National Education Association, 1997: 7-24.
- Weidlich, W., and Haag, G. *Concepts and Models of a Quantitative Sociology*. New York: Springer-Verlag, 1983.
- Zimble, L. *Faculty and Instructional Staff: Who Are They and What Do They Do?* Washington, D.C.: National Center for Education Statistics, 1994.