NEW YORK UNIVERSITY

Arts and Science
Faculty Equity Study, 2007

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Part I: Tenured and tenure eligible cross-sectional analysis for 2007, 2005, and 2000

Description of the data in Part I

Cross-sectional datasets for 2007 (N=621), 2005 (N=586), and 2000 (N=513) were constructed from available faculty records. Tenured and tenure eligible faculty analyses include only assistant professors, associate professors, and full professors.

Descriptive statistics of the 2007, 2005, and 2000 tenured and tenure eligible cross-sections

Figure 1 visually depicts the proportion of female, minority[1], and underrepresented minority[2] faculty in the 2007, 2005, and 2000 cross-sectional populations. In 2007, 28% of the tenured and tenure eligible faculty was female, 16% was minority, and 8% was underrepresented minority.

Figure 1: Proportion female, minority, underrepresented minority (Tenured and tenure eligible faculty)

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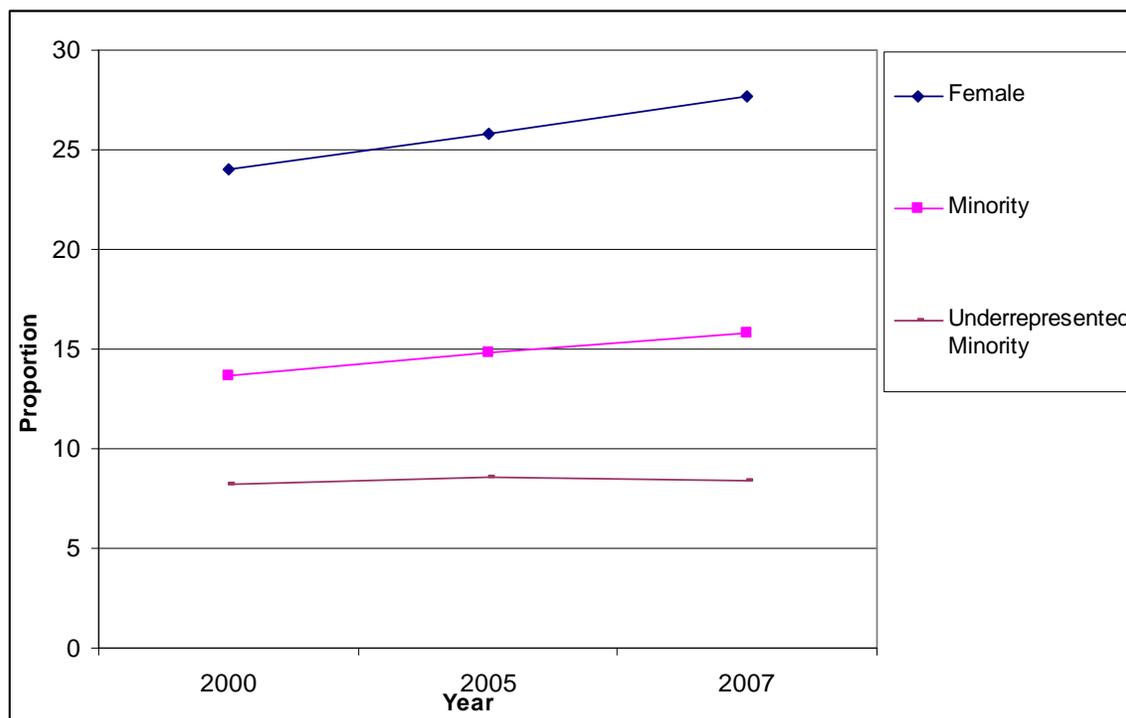
[1] Minority faculty include faculty who self identify at the time of hire as Asian/Pacific Islander, Black, or Hispanic. Data is from Human Resources records.
[2] Underrepresented minority faculty include faculty who self identify at the time of hire as Black or Hispanic. Data is from Human Resources records.

The proportion of females in the humanities, social sciences, and sciences is displayed by academic year in Figure 2. In 2007, 39% of the humanities faculty was female, 28% of the social sciences faculty was female, and 15% of the science faculty was female.

Figure 2: Proportion female by division (Tenured and tenure eligible faculty)
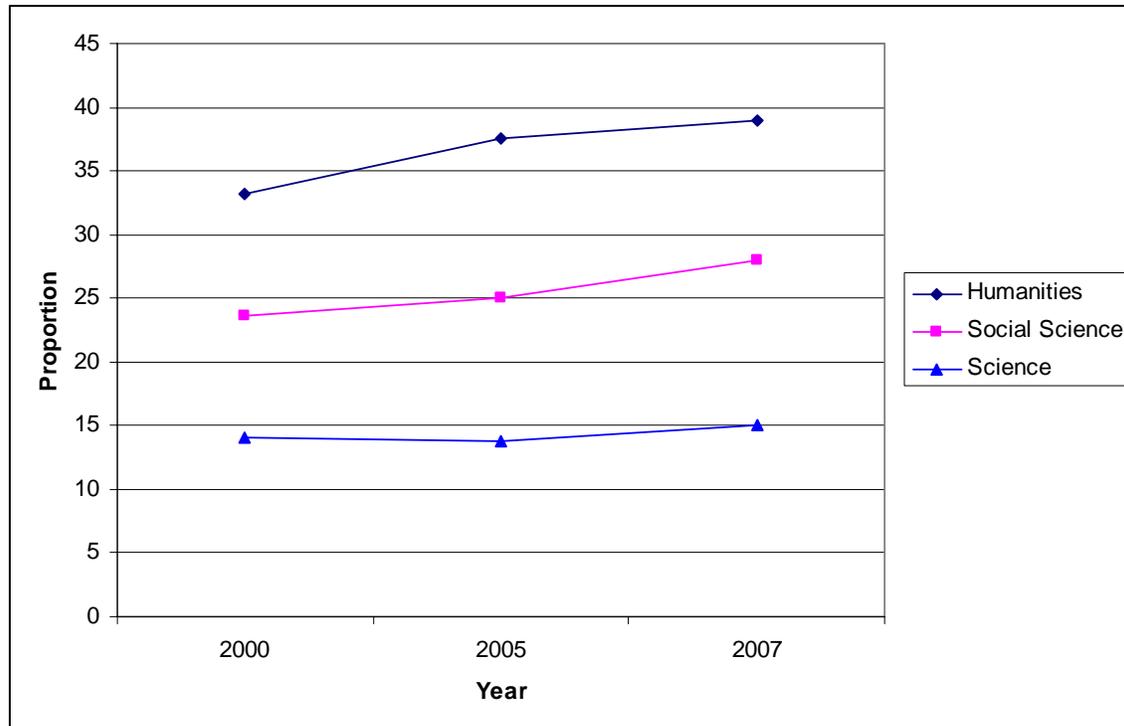
Cross-sectional (2007, 2005, 2000) rank analysis

The null hypothesis that gender and rank are independent was tested with the chi-square statistic for each academic year (2007: $\chi^2=13.27$, $p<0.01$ 2005: $\chi^2=15.23$, $p< 0.001$ 2000: $\chi^2=22.45$, $p<0.0001$). Gender and rank are associated in all three cross-sections. In 2007, for instance, female are underrepresented in the professor rank (82 females are observed to be professors compared to the 101 expected under independence). Stratified analyses indicate that gender is significantly associated with rank, even when controlling for department (Gender: 2007: $\chi^2=10.15$, $p<0.01$ 2005: $\chi^2=3.89$, $p<0.05$ 2000: $\chi^2=14.40$, $p<0.001$).

The null hypothesis that minority status and rank are independent was tested with the chi-square statistic for each academic year (2007: $\chi^2=16.2$, $p<0.001$ 2005: $\chi^2=14.7$, $p<0.001$ 2000: $\chi^2=17.36$, $p<0.001$). Minority status is significantly associated with rank in all three cross-sections. In 2007, for instance, minorities are underrepresented in the full professor rank (41 faculty members who identify as minorities are observed to be professors versus the 57 expected under independence). Minority status is still significantly associated with rank, even when controlling for department (2007: $\chi^2=9.09$, $p<0.01$ 2005: $\chi^2=10.59$, $p<0.01$ 2000: $\chi^2=17.91$, $p<0.001$).

The null hypothesis that underrepresented minority status and rank are independent was tested with the chi-square statistic for each academic year (2007: $\chi^2=8.99$, p<.05 2005: $\chi^2=5.98$, p=.0501 2000: $\chi^2=2.92$, p=.232). Underrepresented minority status is associated with rank in the bivariate in 2007 and 2005, but is independent from rank in 2000. In 2007, underrepresented minority status are over-represented in the associate professor rank (21 observed versus 12 expected) and under-represented in the professor rank (27 observed versus 31 expected). After controlling for department underrepresented minority status is no longer associated with rank (2007: $\chi^2=.003$, p=.9 2005: $\chi^2=1.11$, p=.29).

Table 1: Gender and minority status by rank (Tenured and tenure eligible faculty)

	Gender		Minority		Underrepresented Minority	
	Male	Female	Yes	No	Yes	No
2007 (N=621)						
Assistant	68 (67%)	34 (33%)	19 (19%)	83 (81%)	4 (4%)	98 (96%)
Associate	96 (63%)	56 (37%)	38 (25%)	114 (75%)	21 (14%)	131 (86%)
Full	285 (78%)	82 (22%)	41 (11%)	326 (89%)	27 (7%)	340 (93%)
2005 (N=586)						
Assistant	73 (73%)	27 (27%)	21 (21%)	79 (79%)	8 (8%)	92 (92%)
Associate	88 (62%)	53 (38%)	31 (22%)	110 (78%)	19 (13%)	122 (87%)
Full	274 (79%)	71 (21%)	35 (10%)	310 (90%)	23 (7%)	322 (93%)
2000 (N=513)						
Assistant	47 (59%)	33 (41%)	22 (27%)	58 (73%)	9 (11%)	71 (89%)
Associate	80 (70%)	34 (30%)	17 (15%)	97 (85%)	12 (11%)	102 (89%)
Full	263 (82%)	56 (18%)	31 (10%)	288 (90%)	21 (7%)	298 (93%)

A polytomous logistic regression model with rank as the nominal dependent variable was fit to test the effect of gender on rank, as well as to test age, age-squared, experience, experience-squared, and year of hire as covariates. Table 2 contains parameter coefficients for the two fitted logits for the 2007 full model. Exponentiating the coefficient for females in the associate professor equation gives an odds ratio for the chance of being an associate professor versus a full professor for females versus males. Therefore, females are $e^{(.377)}$ or 1.46 times more likely than males to be associate professors versus full professors holding age, experience, and year of hire constant. The predicted odds ratio for being an associate professor as opposed to an assistant professor for female versus male faculty is given by $e^{(.377-.202)}$. Therefore, females are 1.19 times more likely than males to be associate professors versus assistant professors holding age, experience, and year of hire constant.

Table 2: 2007 Polytomous logistic regression model on rank (Tenured and tenure eligible faculty)

	Assistant Professor	Associate Professor
Intercept	-5.89 (0.776)***	-0.59 (0.151)***
Female	0.202 (0.237)	0.377 (0.137)***
Age	-0.245 (0.087)***	-0.063 (0.031)**
Age-squared	-0.008 (0.004)*	0.0007 (0.001)
Experience	-0.274 (0.056)***	-0.148 (0.032)***
Experience-squared	0.020 (0.004)***	0.004 (0.002)**
Year of hire	0.113 (0.069)*	-0.032 (0.017)*

Notes: Reference category is full professor. Standard errors are in parentheses. ***p<.01 **p<.05 *p<.10

Cross-sectional (2007, 2005, 2000) salary analysis

Tables 3 and 4 present summary measures of the salary distribution for tenured and tenure eligible faculty.

Table 3: Median salary by gender, minority status, and rank (Tenured and tenure eligible faculty)

	Gender		Minority		Underrepresented Minority	
	Male	Female	Yes	No	Yes	No
2007 (N=621)						
Assistant	77,375	70,790	76,483	75,000	75,716	75,003
Associate	97,922	93,746	94,970	95,905	90,000	96,307
Full	143,700	138,418	154,106	140,000	146,100	140,310
2005 (N=586)						
Assistant	72,000	58,455	70,900	70,000	66,289	70,495
Associate	88,153	86,684	89,012	87,897	83,990	88,153
Full	131,700	128,374	142,480	127,189	137,713	128,076
2000 (N=513)						
Assistant	56,074	50,587	54,105	52,999	50,861	54,432
Associate	68,279	68,041	73,089	68,053	71,569	68,132
Full	106,667	101,295	114,950	104,072	114,950	104,539

Table 4: Mean salary by gender, minority status, and rank (Tenured and tenure eligible faculty)

	Gender		Minority		Underrepresented Minority	
	Male	Female	Yes	No	Yes	No
2007 (N=621)						
Assistant	78,725	71,243	75,589	76,378	71,878	76,409
	(13,224)	(10,269)	(10,637)	(13,261)	(9,563)	(12,888)
Associate	101,331	95,394	97,555	99,673	96,902	99,503
	(25,608)	(20,276)	(22,928)	(24,272)	(26,100)	(23,600)
Full	153,767	143,076	155,667	150,839	153,425	151,216
	(52,649)	(37,890)	(40,052)	(51,014)	(38,967)	(50,694)
2005 (N=586)						
Assistant	73,055	61,335	67,180	70,611	65,297	70,290
	(14,564)	(7,187)	(9,992)	(14,819)	(9,836)	(14,243)
Associate	91,341	88,344	89,936	90,292	86,642	90,770
	(22,160)	(20,001)	(20,661)	(21,633)	(17,079)	(21,949)
Full	141,011	132,523	147,733	138,308	145,357	138,829
	(47,797)	(34,837)	(35,952)	(46,424)	(32,618)	(46,309)
2000 (N=513)						
Assistant	59,478	54,043	59,708	56,299	53,319	57,733
	(10,558)	(8,828)	(10,697)	(9,916)	(7,212)	(10,435)
Associate	71,491	67,597	72,679	69,918	73,749	69,927
	(13,712)	(7,162)	(12,917)	(12,131)	(11,991)	(12,255)
Full	113,662	107,209	116,659	112,085	114,159	112,414
	(32,626)	(24,895)	(22,614)	(32,275)	(19,492)	(32,164)

Notes: Standard deviations are in parentheses

Two linear regressions were run for each of the three years' cross sections of tenure and tenure eligible faculty salary: a reduced model showing only gender and a full model showing gender, rank, and year of hire.

Table 5: Linear regression on log salary (Tenure and tenure eligible faculty)

	2007		2005		2000	
	Reduced model	Full model	Reduced model	Full model	Reduced model	Full model
Intercept	11.71	12.00	11.62	11.69	11.47	11.55
	(0.017)***	(0.161)***	(0.018)***	(0.061)***	(.017)***	(0.059)***
Female	-0.013	-0.006	-0.125	-0.031	-0.182	-0.018
	(0.033)***	(0.022)	(0.035)***	(0.023)	(0.035)***	(0.034)
Rank						
Assistant		-0.79		-0.82		-0.76
		(0.029)***		(0.029)***		(0.029)***
Associate		-0.46		-0.47		-0.47
		(0.024)***		(0.024)***		(0.023)***
Department †		***		***		***
Year of hire		0.01		0.01		0.01
		(0.001)***		(0.008)***		(0.001)***
R^2	0.02	0.66	0.02	0.68	0.05	0.70
N	621	621	586	586	513	513

Notes: Standard errors are in parentheses. ***$p<.01$ **$p<.05$ *$p<.10$
†Due to the number of variables, only the overall significance of the variable department is shown.

In all three reduced models gender is a significant predictor of log salary. In the 2007 reduced model, for instance, females have on average .013 units less log salary than males. However, after controlling for rank, department, and year of hire, gender is no longer a significant predictor of log salary. Instead, rank, department, and year of hire appear to explain the majority of the variance in log salary in each year.

A visual representation of the relationship between average female and average male salary at each rank can be seen in Figure 3. In this figure the size of a bubble is proportional to the count of tenured and tenure eligible professors at each rank. The scale shown is a linear transformation of mean salary, and is the same for all similar charts. As rank increases, average salary increases for females and males.

Figure 3: Average salary by rank (Tenure and tenure eligible faculty, 2007)
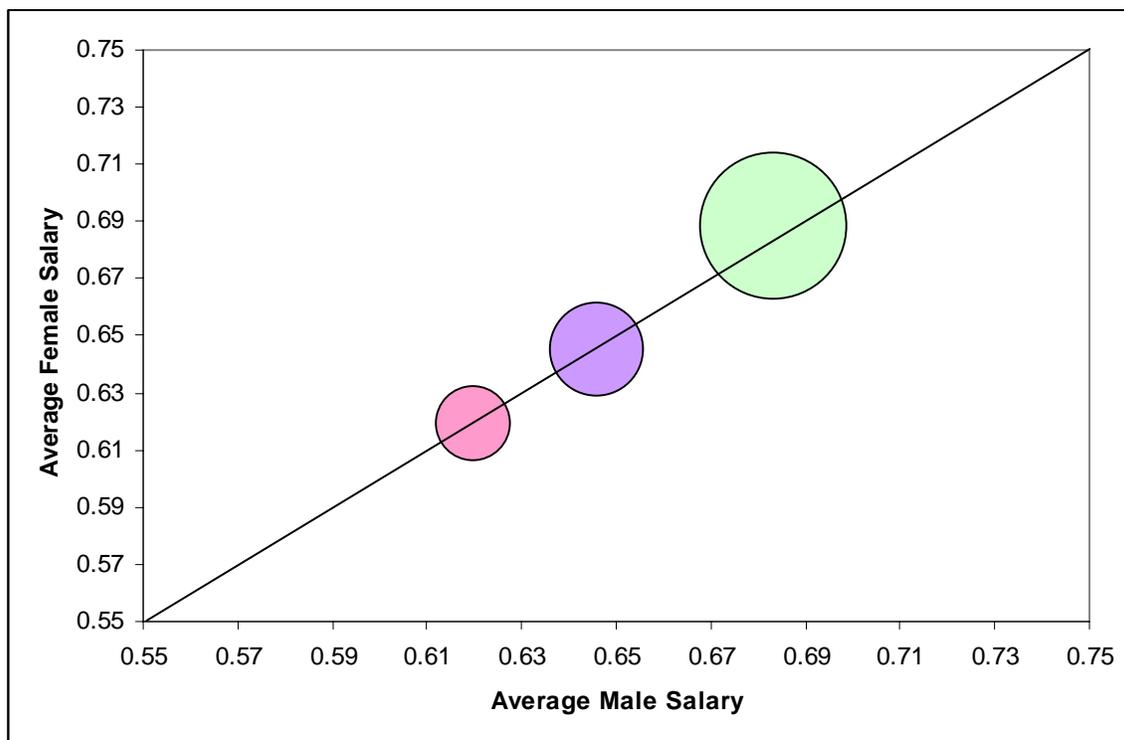
Aggregate-level analysis of departmental salary

Figures 4 through 8 provide a visual depiction of the relationship between average female and average male salary, aggregated by department. The figures are organized by rank, including assistant (Figure 4), associate (Figure 5), and full professors (Figure 6). Figure 7 summarizes the association between male and female average salaries across all ranks. Figure 8 depicts the overall average salary in a department and the proportion males in that department. In all of these figures, the area of a bubble is proportional to the count of tenure and tenure eligible faculty being reported in each department. Departments without either male or female faculty at the ranks considered are omitted from each figure.

Figure 4: Assistant professors (2007)
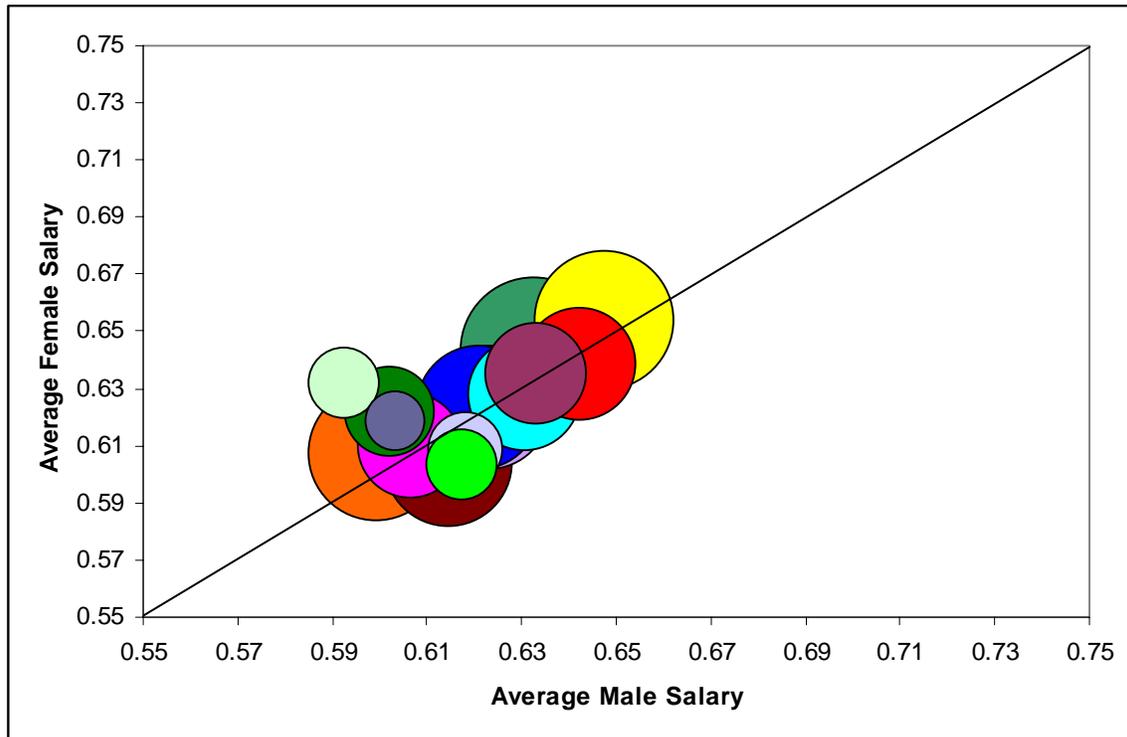
Notes: 6 departments with only female and 6 departments with only male assistant professors are excluded.

Figure 5: Associate professors (2007)
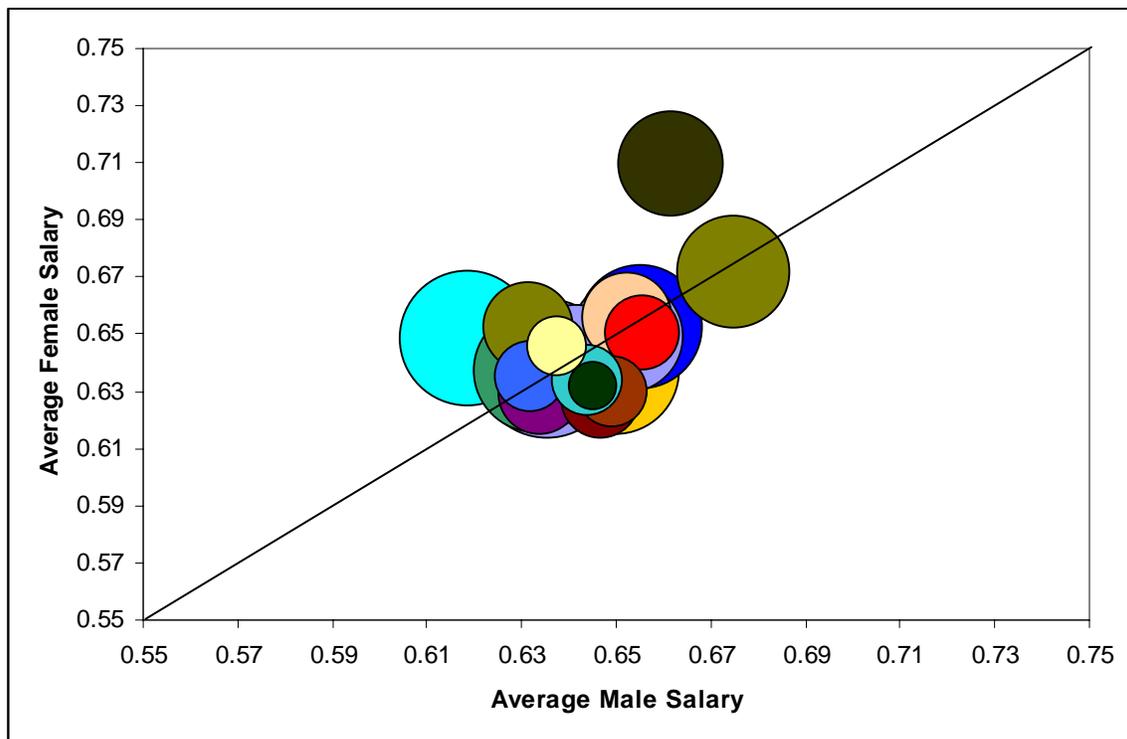
Notes: 3 departments with only female and 5 departments with only male associate professors are excluded.

Figure 6: Professors (2007)
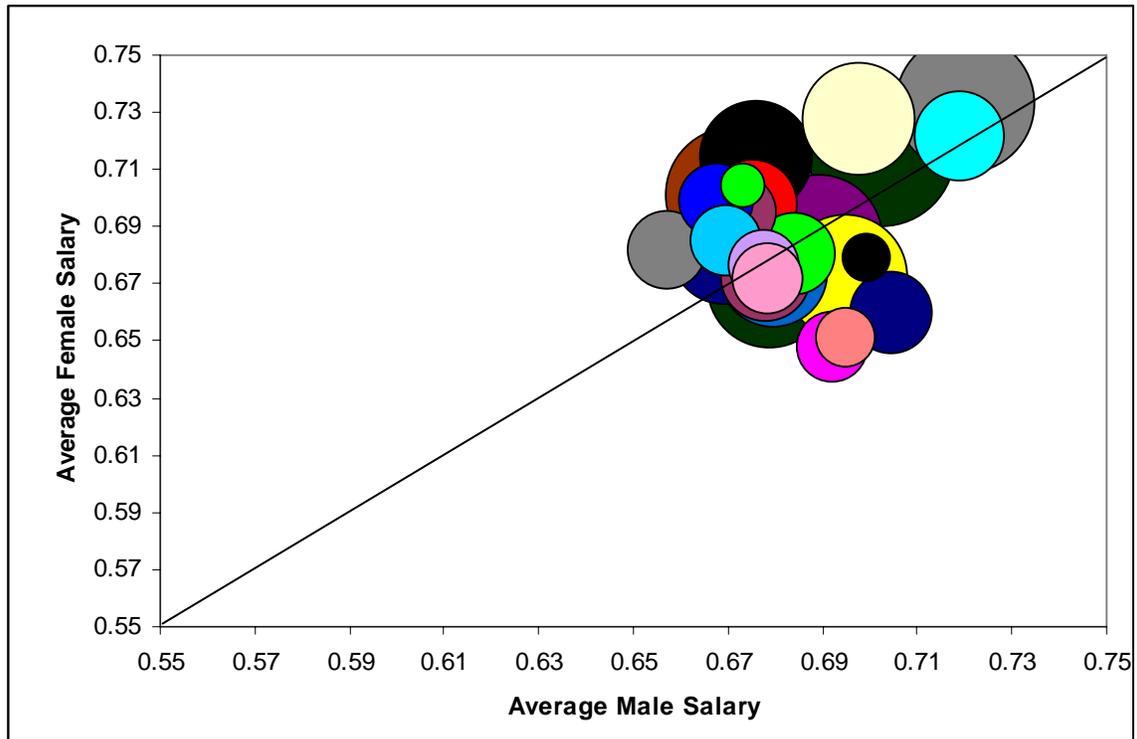
Notes: 2 departments with only male professors are excluded.

Figure 7: Overall Salary (2007)
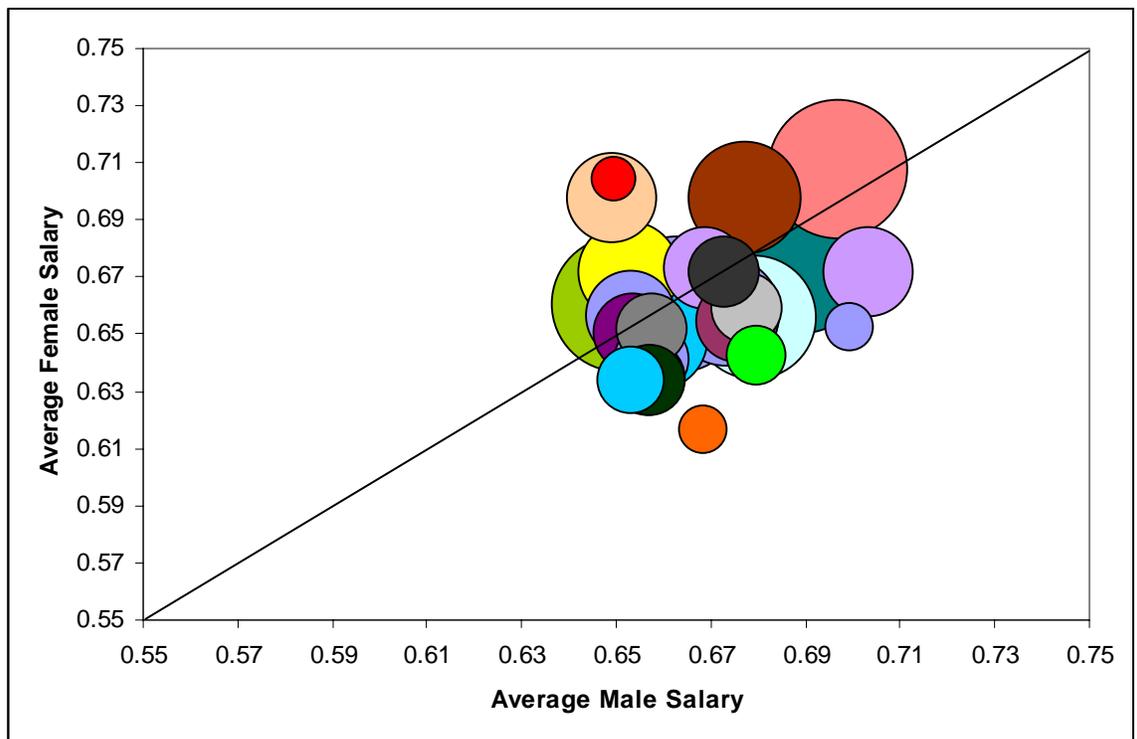
Notes: All 30 departments are included.

Figure 8: Salary and proportion males in the department (2007)
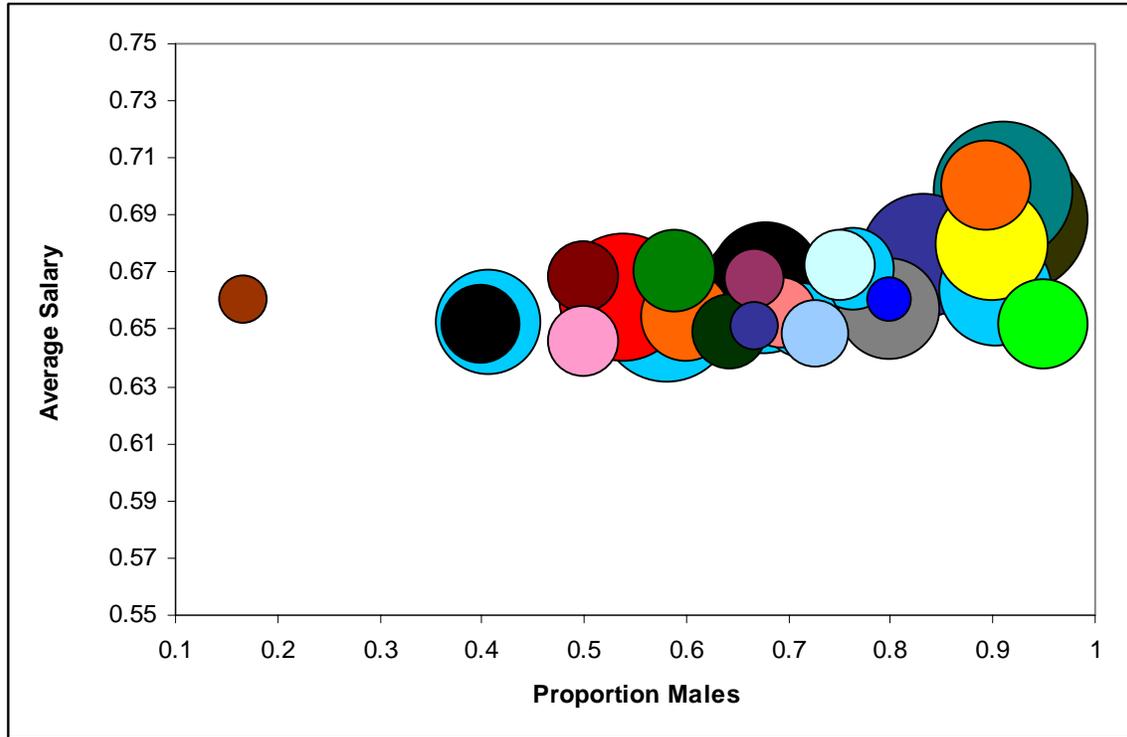
Notes: All 30 departments are included.

Table 6: Linear regression on average departmental salary (Tenured and tenure eligible faculty)

	2007		2005		2000	
	Reduced model	Full model	Reduced model	Full model	Reduced model	Full model
Intercept	11.36	11.61	11.27	11.51	11.09	11.37
	(0.097)	(0.055)***	(0.121)***	(0.126)***	(0.094)***	(0.071)***
Proportion	0.38	0.343	0.38	0.41	0.34	0.30
Males	(0.135)**	(0.114)**	(0.169)**	(0.152)**	(0.131)**	(.083)**
Rank						
Proportion		-0.66		-0.76		-0.82
Assistant		(0.275)**		(0.232)**		(0.141)***
Proportion		-0.42		-0.52		-0.48
Associate		(0.145)**		(0.154)**		(0.119)**
Average		0.003		0.02		0.01
Year of hire		(0.005)		(0.006)**		(0.004)**
R^2	0.15	0.57	0.15	0.60	0.15	0.71
N	30	30	29	29	33	33

Notes: Standard errors are in parentheses. ***$p<.01$ **$p<.05$ *$p<.10$

A linear regression model on aggregate data grouped by department was constructed to test the relationship between departmental average log salary and departmental gender composition. The 2000, 2005, and 2007 reduced regression models show a positive relationship between the proportion of males in a department and the average departmental salary. This finding remains significant in the full models after controlling

for the proportion of tenured and tenure eligible faculty at each rank and the department's average year of hire. These data can only be interpreted at the departmental level.

Cross-sectional (2007, 2005, 2000) administrative responsibility analysis

Table 7: Administrative responsibility by gender and minority status (Tenured and tenure eligible faculty)

	Gender		Minority		Underrepresented Minority	
	Male	Female	Yes	No	Yes	No
2007	90 (20%)	39 (22%)	19 (19%)	110 (21%)	13 (25%)	116 (20%)
2005	97 (22%)	40 (26%)	21 (24%)	116 (23%)	14 (28%)	123 (23%)
2000	98 (25%)	39 (31%)	13 (19%)	124 (28%)	12 (28%)	125 (27%)

Counts of faculty who have an administrative responsibility are displayed in table 7. Administrative responsibility was defined as being a dean or provost, a director of graduate or undergraduate studies, a department chair, or another officer of administration.

The null hypothesis that gender and administrative responsibility are independent was tested with the chi-square statistic (2007: $\chi^2=0.52$, p=0.47 2005: $\chi^2=1.09$, p=0.29 2000: $\chi^2=2.06$, p=0.15). The null hypothesis cannot be rejected; gender and having an administrative role are independent in all three cross sections.

The null hypothesis that minority status and administrative responsibility are independent was tested with the chi-square statistic (2007: $\chi^2=0.14$, p=0.71 2005: $\chi^2=0.03$, p=0.86 2000: $\chi^2=2.74$, p=0.098). In 2007 and 2005, the null hypothesis cannot be rejected; minority status and having an administrative role are independent. In 2000, there may be a trend (p<.10) between minority status and having an administrative role. However, upon stratifying by rank, there is no longer an association in 2000 ($\chi^2=1.63$, p=0.20).

The null hypothesis that underrepresented minority status and administrative responsibility are independent was tested with the chi-square statistic (2007: $\chi^2=0.62$, p=0.43 2005: $\chi^2=0.65$, p=0.42 2000: $\chi^2=0.08$, p=0.78). The null hypothesis cannot be rejected; under-represented minority status and having an administrative role are independent in 2007, 2005, and 2000.

Cross-sectional (2007, 2005, 2000) internal research analysis

Table 8: Received internal research support by gender and minority status (Tenured and tenure eligible faculty)

	Gender		Minority		Underrepresented Minority	
	Male	Female	Yes	No	Yes	No
2007	238 (53%)	129 (75%)	61 (62%)	306 (58%)	41 (79%)	326 (57%)
2005	213 (49%)	107 (70%)	57 (65%)	263 (52%)	38 (76%)	282 (52%)
2000	143 (37%)	72 (59%)	36 (51%)	179 (40%)	27 (64%)	188 (40%)

Counts of faculty who have received internal research support are displayed in table 8. Additionally, a categorical analysis of whether or not faculty received internal research funds was conducted. The null hypothesis that the presence of research funds and gender are independent was tested with the chi-square statistic for each academic year (2007: χ^2=24.88, p<.0001 2005: χ^2=21.68, p<.0001 2000: χ^2=18.37, p<.0001). The null hypothesis is rejected. Gender and the presence of research funds are associated in 2007, 2005, and 2000. Females have 2.65 times the odds of males of obtaining research funds in 2007, 2.53 times the odds of obtaining funds in 2005, and 2.43 times the odds of obtaining funds in 2000. In 2007 and 2005, upon stratifying by division, gender and the presence of research funds are no longer associated (2007: χ^2=1.87, p=.18 2005: χ^2=1.33, p=.25). In 2000, gender remains associated with receiving research support, even when controlling for division (2000: χ^2=4.83, p<.05). In 2000, female faculty members are 1.73 times more likely then males to obtain research funds, controlling for division.

Minority status and the presence of research funds are independent in 2007 (2007: χ^2=0.47, p=0.49). However, in 2005, minority status and the presence of research funds are associated (2005: χ^2=4.91, p<.05). In fact, in 2005, a minority faculty member has 1.70 times the odds of a non-minority faculty member of obtaining research funds. Upon stratifying by division, minority status and the presence of research funds are no longer associated (2005: χ^2=1.71, p=0.19). In 2000, there may be a trend between minority status and the presence of research funds (2005: χ^2=3.07, p<.10). In 2000, a minority faculty member has 1.56 times the odds of a non-minority faculty member of obtaining research funds. Upon stratifying by division, minority status and the presence of research funds are no longer associated (2000: χ^2=2.59, p=0.11).

Underrepresented minority status and the presence of research funds are associated in 2007, 2005, and 2000 (2007: χ^2=9.15, p<.01 2005 χ^2=10.09, p<.01 2000 χ^2=9.41, p<.01). Underrepresented minorities have 2.77 times the odds of non-underrepresented minorities of obtaining research funds in 2007, 2.85 times the odds of obtaining funds in 2005, and 2.71 times the odds of obtaining funds in 2000. However, upon stratifying by division, underrepresented minority status and the presence of research funds are no longer associated (2007: χ^2=0.09, p=0.76 2005: χ^2=0.83, p=0.36 2000: χ^2=2.52, p=0.11).

Table 9: Linear regression on log internal research support (Tenured and tenure eligible faculty)

	2007		2005		2000	
	Reduced model	Full model	Reduced model	Full model	Reduced model	Full model
Intercept	8.69	9.34	8.59	8.64	8.48	8.62
	(0.042)***	(0.530)***	(.045)***	(.159)***	(0.059)***	(0.213)***
Female	-0.02	0.10	-0.05	-.001	-0.32	-0.062
	(0.071)	(0.063)	(0.078)	(0.060)	(0.102)***	(0.094)
Rank						
Assistant		-0.09		-0.99		-0.87
		(.089)***		(.088)***		(.125)***
Associate		-0.05		-0.49		-0.61
		(0.076)		(0.081)		(.128)***
Department†		***		***		*
Year of hire		0.03		0.03		0.02
		(.003)***		(.003)***		(.005)***
R^2	0.00	0.39	0.001	0.45	0.05	0.42
N	367	367	320	320	215	215

Notes: Standard errors are in parentheses. ***$p<.01$ **$p<.05$ *$p<.10$
†Due the number of dummy variables, only the overall significance of the variable department is shown.

In addition to the categorical analysis, a subgroup analysis limited to faculty who received internal research support was conducted to test whether or not gender was a predictor of the logarithm of the amount of internal research support (Table 9). In 2007 and 2005 gender is not a significant predictor of the amount of log internal research support in the reduced or full model. In 2000 gender is a significant predictor of the amount of log internal research support in the reduced model. However, after controlling for rank, department, and year of hire, gender is no longer significantly related to the log of the amount of internal research support.

Part II: Contract faculty cross-sectional analysis for 2007, 2005, and 2000

Description of the data in Part II

Cross-sectional datasets for 2007 (N=199), 2005 (N=124), and 2000 (N=46) were constructed from available faculty records. In the following analyses, contract faculty designated as "tenure bound faculty" include Assistant professors/Faculty Fellows and Courant Instructors. Contract faculty designated as "non tenure track faculty" include all Clinical Faculty and Language Lecturers.

Descriptive statistics of the 2007, 2005, and 2000 contract faculty cross-sections

Figure 9 visually depicts the proportion of female, minority, and underrepresented minority contract faculty in the 2007, 2005, and 2000 cross-sectional populations. In 2007, 52% of the contract faculty was female, 24% was minority, and 9% was underrepresented minority.

Figure 9: Proportion female, minority, underrepresented minority (Contract faculty)
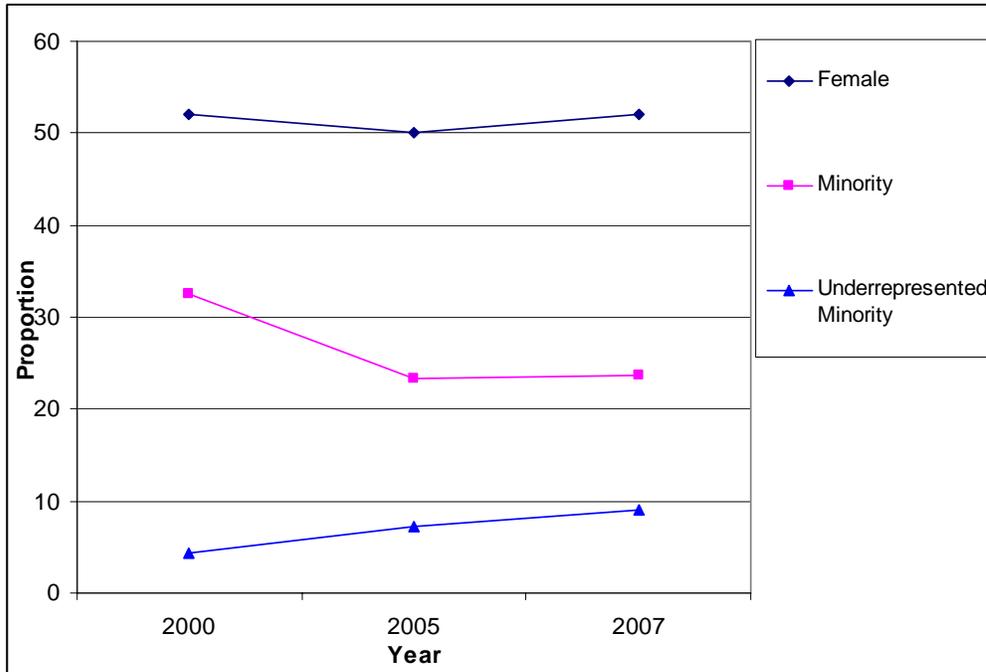
The proportion of females in the humanities, social sciences, and sciences is displayed by academic year in Figure 10. In 2007, 60% of the humanities contract faculty was female, 40% of the social sciences faculty was female, and 22% of the science contract faculty was female.

Figure 10: Proportion female by division (Contract faculty)
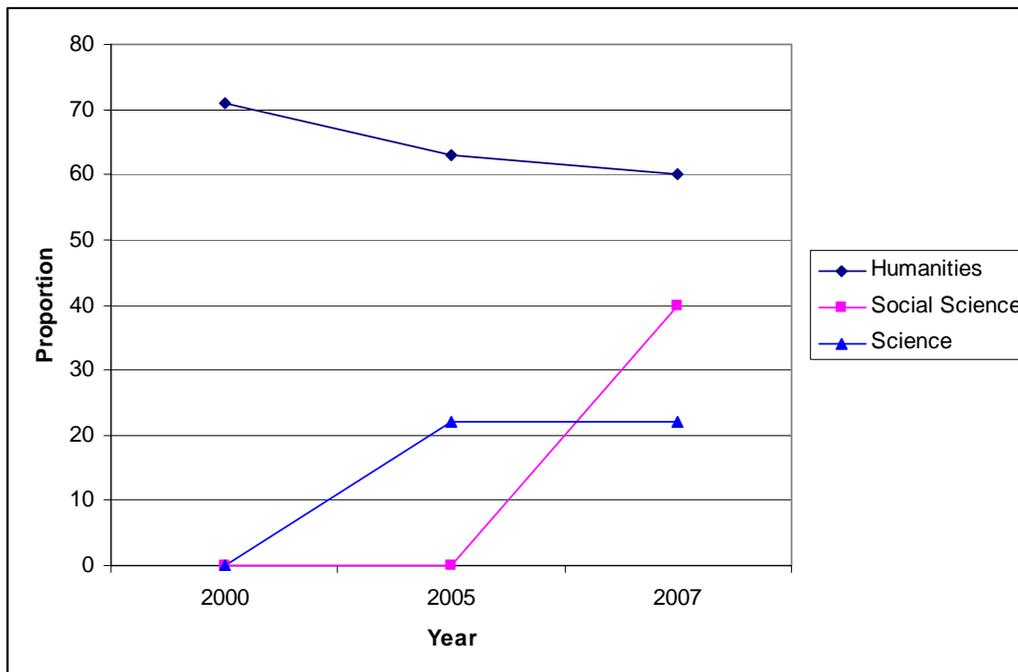
Cross-sectional (2007, 2005, 2000) rank analysis

Table 10 depicts the number and percentage of contract faculty who are tenure bound (TBF) and contract faculty who are non tenure track (NTT).

Table 10: Gender and minority status by rank (Contract faculty)

	Gender		Minority		Underrepresented Minority	
	Male	Female	Yes	No	Yes	No
2007 (N=199)						
TBF	25 (53%)	22 (46%)	15 (32%)	32 (68%)	5 (11%)	42 (89%)
NTT	70 (46%)	82 (54%)	32 (21%)	120 (79%)	13 (9%)	139 (91%)
2005 (N=124)						
TBF	23 (59%)	16 (41%)	7 (18%)	32 (82%)	1 (3%)	38 (97%)
NTT	39 (46%)	46 (54%)	22 (26%)	63 (74%)	8 (9%)	77 (91%)
2000 (N=46)						
TBF	5 (50%)	5 (50%)	2 (20%)	8 (80%)	0 (0%)	10 (100%)
NTT	17 (47%)	19 (53%)	13 (36%)	23 (64%)	2 (6%)	34 (94%)

Notes: TBF=Tenure bound faculty i.e. Assistant Professor/Faculty Fellows and Courant Instructors.
NTT= Not Tenure Track i.e. Clinical Faculty and Language Lecturers.

Cross-sectional (2007, 2005, 2000) salary analysis

Tables 11 and 12 present summary measures of the salary distribution for tenure bound and non tenure track faculty.

Table 11: Median salary by gender, minority status, and rank (Contract faculty)

	Gender		Minority		Underrepresented Minority	
	Male	Female	Yes	No	Yes	No
2007 (N=199)						
TBF	48,559	46,418	49,320	47,709	49,320	48,459
NTT	48,867	45,161	46,108	46,247	43,834	46,264
2005 (N=124)						
TBF	50,746	44,202	50,746	46,119	N/A	46,332
NTT	51,835	43,158	43,066	49,450	41,086	47,478
2000 (N=46)						
TBF	37,492	36,400	N/A	36,854	N/A	36,585
NTT	47,649	40,000	37,325	47,798	N/A	44,042

Notes: TBF=Tenure bound faculty i.e. Assistant Professor/Faculty Fellows and Courant Instructors.
NTT= Not Tenure Track i.e. Clinical Faculty and Language Lecturers.
N/A = There were less than 3 faculty in this category, so median statistics were not reported.

Table 12: Mean salary by gender, minority status, and rank (Contract faculty)

	Gender		Minority		Underrepresented Minority	
	Male	Female	Yes	No	Yes	No
2007 (N=199)						
TBF	49,108	47,929	48,475	48,594	49,111	48,490
	(10,152)	(4,431)	(6,659)	(8,579)	(3,894)	(8,323)
NTT	57,678	49,565	49,783	54,239	49,303	53,675
	(16,587)	(11,210)	(10,387)	(15,285)	(11,856)	(14,679)
2005 (N=124)						
TBF	47,804	46,029	47,245	47,039	N/A	47,262
	(5,132)	(5,087)	(5,535)	(5,122)		(5,056)
NTT	55,512	48,135	44,488	53,975	43,411	52,362
	(15,276)	(10,880)	(6,148)	(14,526)	(7,909)	(13,729)
2000 (N=46)						
TBF	38,438	36,021	N/A	37,612	N/A	37,230
	(4,821)	(952)		(3,861)		(3,515)
NTT	49,144	42,055	40,000	48,456	N/A	45,394
	(13,327)	(7,266)	(4,201)	(12,500)		(11,327)

Notes: TBF=Tenure bound faculty i.e. Assistant Professor/Faculty Fellows and Courant Instructors.
NTT= Not Tenure Track i.e. Clinical Faculty and Language Lecturers.
N/A = There were less than 3 faculty in this category, so mean statistics were not reported.
Standard deviations are in parentheses

Two linear regressions were run for each of the three years' cross sections of contract faculty salaries: a reduced model showing only gender and a full model showing gender, rank, and year of hire (Table 13).

Table 13: Linear regression on log salary (Contract faculty)

	2007		2005		2000	
	Reduced model	Full model	Reduced model	Full model	Reduced model	Full model
Intercept	10.88	10.80	10.85	10.45	10.71	10.65
	(0.023)***	(0.15)***	(0.026)***	(0.061)***	(0.045)***	(0.322)***
Female	-0.10	-0.03	-0.09	0.0004	-0.12	-0.003
	(0.031)***	(0.025)	(0.036)**	(0.026)	(0.036)*	(0.079)
Rank		0.24		0.18		-0.01
(NTT)		(0.061)***		(0.052)		(0.248)
Department †		***		***		N.S.
Year of hire		-0.01		-0.02		-0.04
		(0.002)***		(0.003)***		(0.12)***
R^2	.07	.64	.05	.77	.07	.69
N	199	199	124	124	46	46

Notes: Standard errors are in parentheses. ***p<.01 **p<.05 *p<.10
†Due to the number of variables, only the overall significance of the variable department is shown.

In all three reduced models gender is a significant predictor of log salary. In the 2007 reduced model, for instance, females have on average .10 units less log salary than males. However, after controlling for rank, department, and year of hire gender is no longer a significant predictor of log salary in any of the full models. In 2007, for instance, rank, department, and year of hire appear to explain the majority of the variance in log salary.

A visual representation of the relationship between average female and average male salary in the contract faculty groups can be seen in Figure 11. In this chart the size of the bubble is proportional to the count of contract faculty at each rank. The smaller bubble represents tenure bound faculty and the larger bubble represents non tenure track faculty.

Figure 11: Average salary by rank (Contract faculty, 2007)
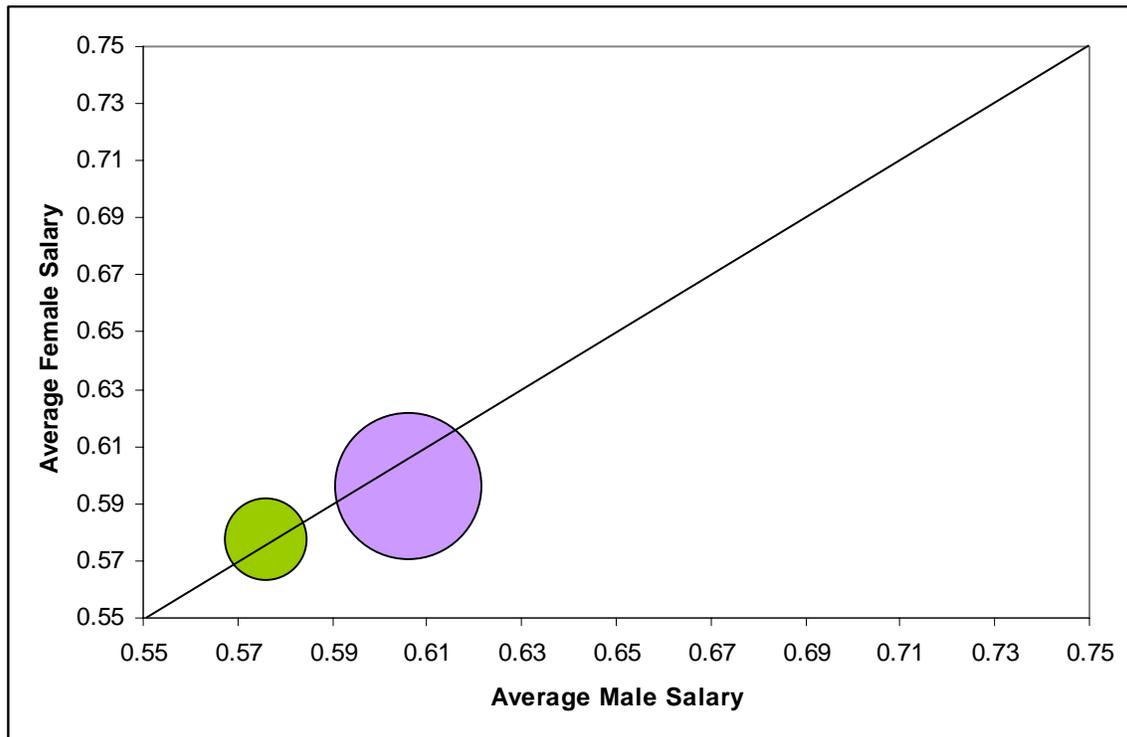
Aggregate-level analysis of departmental salary

The following figures provide a visual depiction of the relationship between average female and average male salary, in 2007, aggregated by department. The figures are organized by rank: tenure bound faculty (Figure 12) and non tenure track faculty (Figure 13). Figure 14 summarizes the association between male and female average salaries across all departments. Figure 15 depicts the overall average salary in a department and the proportion of male contract faculty in that department. In all of these figures, the area of a bubble is proportional to the count of contract faculty in each department. Departments without either male or female faculty at the ranks considered are omitted from each figure.

Figure 12: Tenure bound faculty (2007)
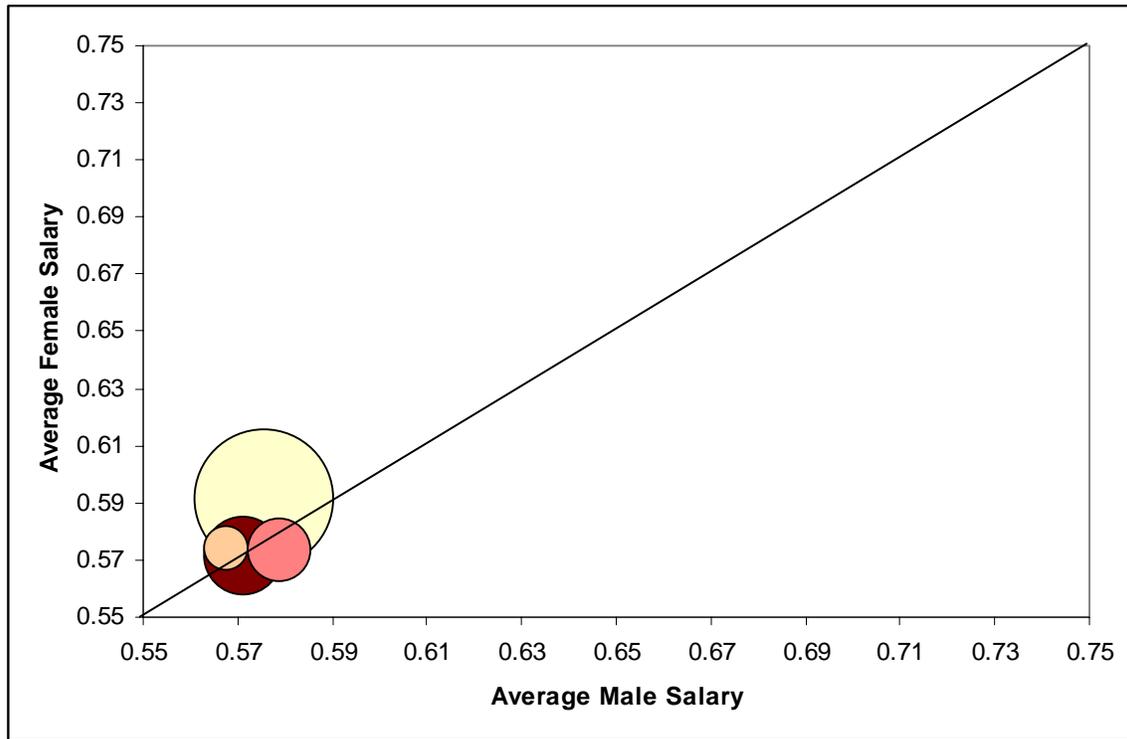
Notes: 5 departments with only female faculty and 4 departments with only male faculty are excluded.

Figure 13: Non tenure track faculty (2007)
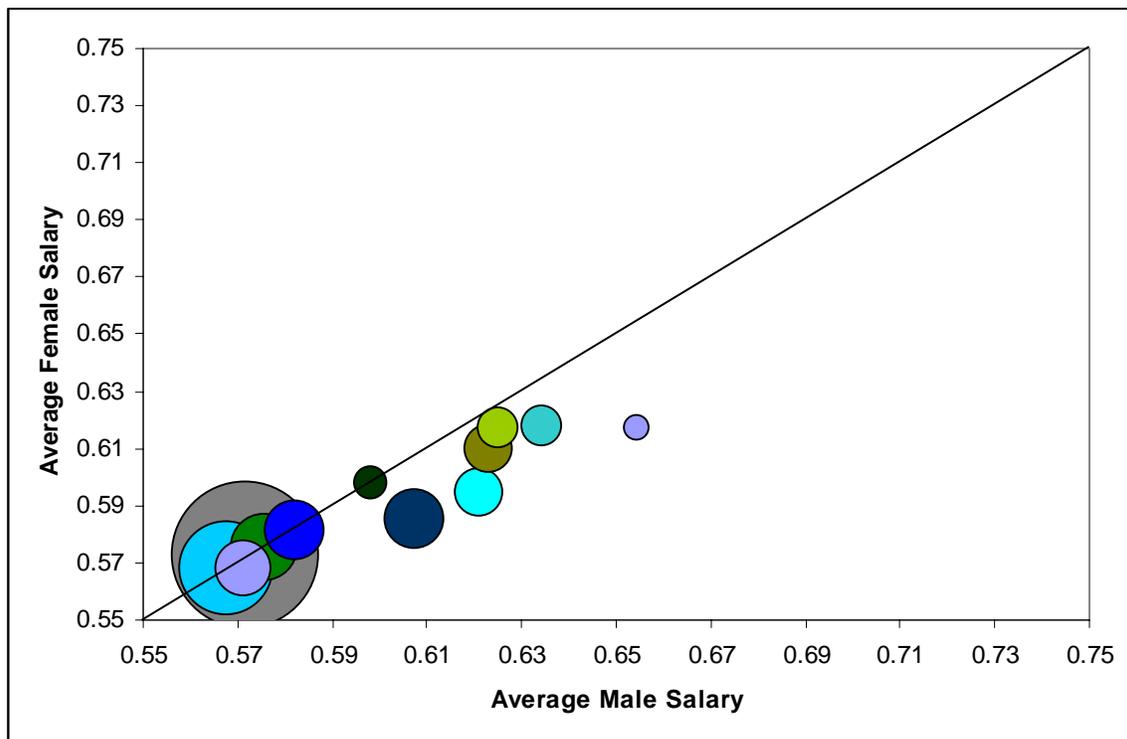
Notes: 4 departments with only female faculty and 9 departments with only male faculty are excluded.

Figure 14: Overall Salary (2007)
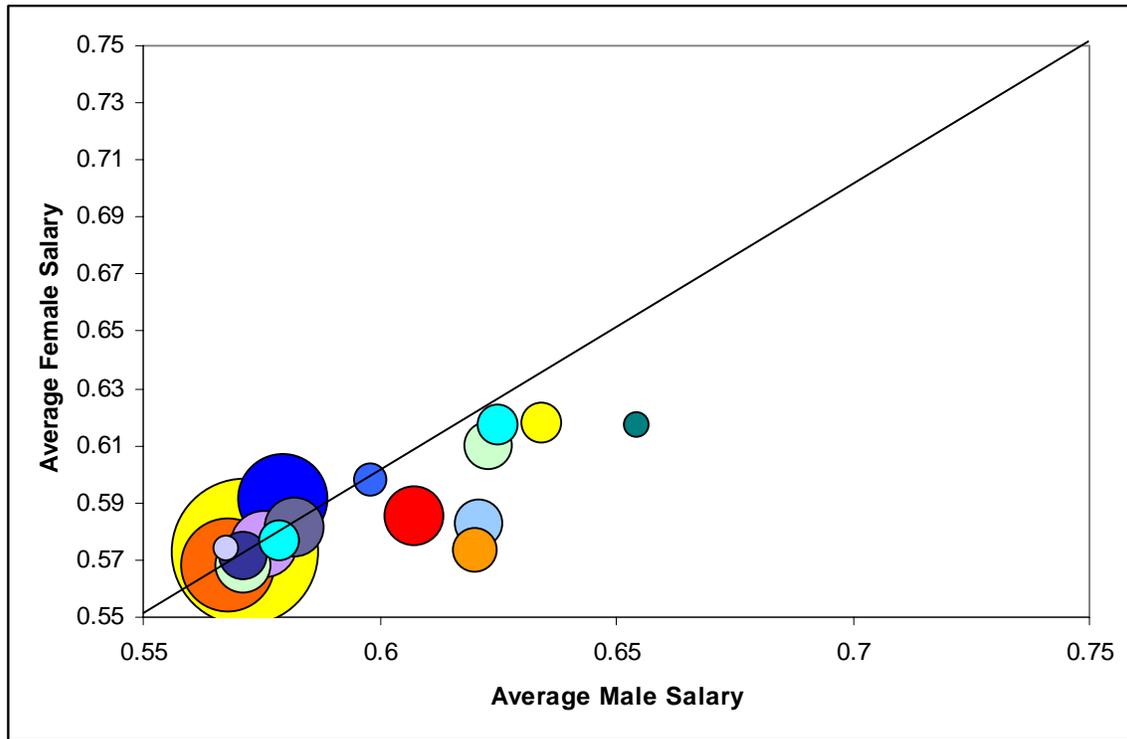
Notes: 4 departments with only female faculty and 11 departments with only male faculty are excluded.

Figure 15: Salary and proportion males in the department (2007)
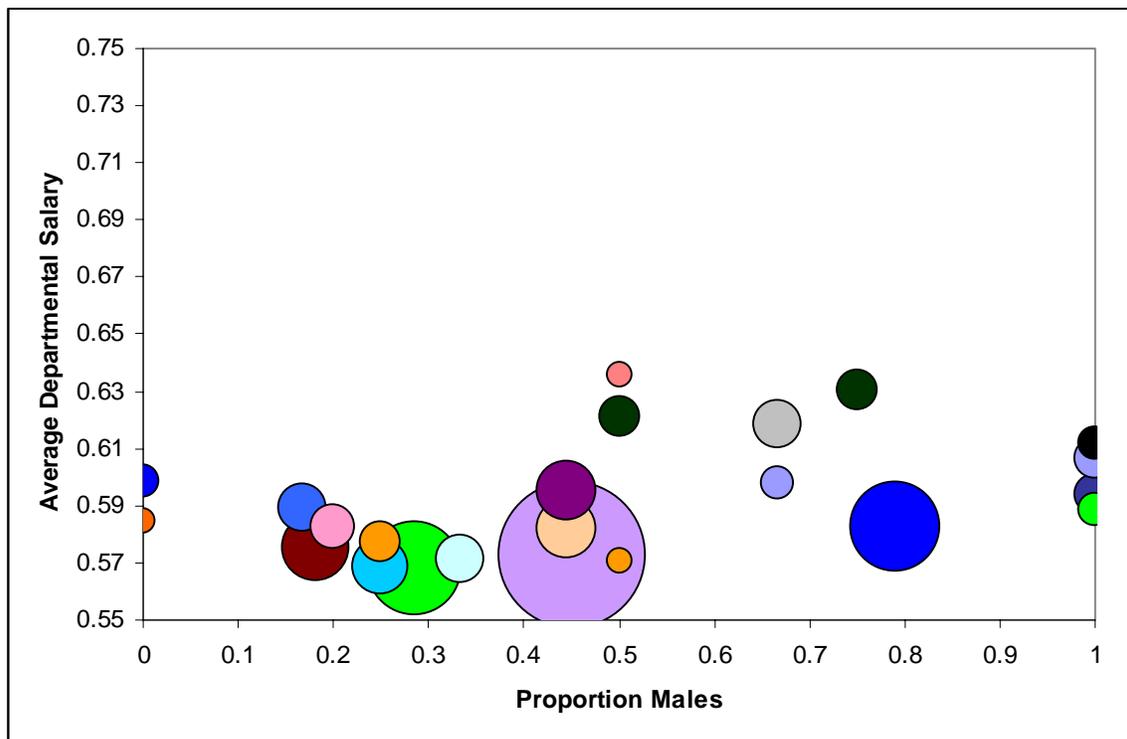
Notes: All 32 departments are included.

A linear regression model on aggregate data grouped by department was constructed to test the relationship between departmental average log salary and departmental gender composition for contract faculty (Table 14). The 2000, 2005, and 2007 reduced regression models show no relationship between the proportion of males in a department's contract faculty and the average departmental salary.

Table 14: Linear regression on average departmental salary (Contract faculty)

	2007 Reduced model	2005 Reduced model	2000 Reduced model
Intercept	10.84 (0.06)***	10.78 (0.06)***	10.67 (0.06)***
Proportion Males	0.160 (0.09)	0.091 (0.09)	0.05 (0.09)
R^2	.082	.035	.01
N	32	30	19

Notes: Standard errors are in parentheses. ***p<.01 **p<.05 *p<.10

Cross-sectional (2007, 2005, 2000) administrative responsibility analysis

Table 15: Administrative responsibility by gender and minority status (Contract faculty)

	Gender		Minority		Underrepresented Minority	
	Male	Female	Yes	No	Yes	No
2007	7 (7%)	5 (5%)	3 (6%)	9 (6%)	0 (0%)	12 (7%)
2005	3 (5%)	8 (12%)	4 (14%)	7 (7%)	0 (0%)	11 (9%)
2000	2 (8%)	2 (9%)	1 (7%)	3 (10%)	0 (0%)	4 (9%)

Counts of contract faculty with administrative responsibilities are displayed in Table 15. Administrative responsibility was defined as being a dean or provost, a director of graduate or undergraduate studies, a department chair, or another officer of administration.

The null hypothesis that gender and administrative responsibility are independent was tested with the chi-square statistic in 2007 and 2005, and Fisher's exact test in 2000 (2007: χ^2=0.57, p=0.45 2005: χ^2=2.49, p=0.11 2000: p=1.00). The null hypothesis cannot be rejected; gender and having an administrative role are independent in all three cross sections.

The null hypothesis that minority status and administrative responsibility are independent was tested with Fisher's exact test (2007: p=0.91 2005: p=0.28 2000: p=1.00). In 2007 2005, and 2000 the null hypothesis cannot be rejected; minority status and having an administrative role are independent.

The null hypothesis that underrepresented minority status and administrative responsibility are independent was tested with Fisher's exact test (2007: p=0.61 2005: p=1.00 2000: p=1.00). The null hypothesis cannot be rejected; under-represented

minority status and having an administrative role are independent in 2007, 2005, and 2000.

Cross-sectional (2007, 2005, 2000) internal research analysis

Table 16: Received internal research support by gender and minority status (Contract faculty)

	Gender		Minority		Underrepresented Minority	
	Male	Female	Yes	No	Yes	No
2007	62 (65%)	92 (88%)	37 (78%)	117 (77%)	16 (89%)	138 (76%)
2005	29 (47%)	46 (74%)	20 (69%)	55 (58%)	7 (77%)	68 (59%)
2000	5 (22%)	4 (17%)	3 (20%)	6 (19%)	1 (50%)	8 (18%)

Counts of contract faculty receiving internal research support are displayed in Table 16. Additionally, a categorical analysis of whether or not faculty received internal research funds was conducted. The null hypothesis that the presence of research funds and gender are independent was tested with the chi-square statistic for 2007 and 2005, and tested with Fisher's exact test in 2000 (2007: χ^2=15.27, p<.0001 2005: χ^2=9.75, p<.01 2000: p=0.72). For 2007 and 2005, the null hypothesis is rejected. Gender and the presence of research funds are associated in 2007 and 2005. Females have 4.1 times the odds of males of obtaining research funds in 2007 and 3.27 times the odds of obtaining funds in 2005. Upon stratifying by division, gender and the presence of research funds are no longer associated (2007: χ^2=1.13, p=0.29 2005: χ^2=0.12, p=0.73). Gender and the presence of research funds are independent in the 2000 data.

The null hypothesis that the presence of research funds and minority status are independent was tested with the chi-square statistic for 2007 and 2005, and tested with Fisher's exact test in 2000. Minority status and the presence of research funds are independent in 2007, 2005, and 2000 (2007: χ^2=0.06, p=0.80 2005: χ^2=1.14, p=0.29 2000: p=1.00).

The null hypothesis that the presence of research funds and underrepresented minority status are independent was tested with the chi-square statistic for 2007 and 2005, and tested with Fisher's exact test in 2000. Underrepresented minority status and the presence of research funds are independent in 2007, 2005, and 2000 (2007: χ^2=1.49, p=0.22 2005: χ^2=1.21, p=0.27 2000: p=0.36).

Table 17: Linear regression on log internal research support (Contract faculty)

| | 2007 | | 2005 | |
	Reduced model	Full model	Reduced model	Full model
Intercept	7.23	7.45	7.11	7.06
	(0.050)***	(0.242)***	(0.072)***	(0.079)***
Female	-0.09	0.04	-0.02	0.00
	(0.065)	(0.044)	(0.092)	(0.060)
Department†		***		***
Year of hire		0.024		-0.045
		(0.004)***		(0.007)***
R^2	0.01	0.69	0.003	0.76
N	154	154	75	75

Notes: Standard errors are in parentheses. ***$p<.01$ **$p<.05$ *$p<.10$
†Due to the number of dummy variables, only the overall significance of the variable department is shown.

In addition to the categorical analysis, a subgroup analysis limited to faculty who received internal research support was conducted to test whether or not gender was a predictor of the logarithm of the amount of internal research support (Table 17). In 2007 and 2005 gender is not a significant predictor of the amount of log internal research support in the reduced or full model. Since only 9 contract faculty received research support in 2000, a statistical model was not fit to the data from that year.

Part III: Tenured and tenure eligible new hires analysis

Description of the data in Part III

Faculty who were hired at the rank of assistant, associate (with or without tenure), and full professor between 6/1/1995 and 4/2/2007 were selected (N=396) for the starting rank and starting salary analyses. Faculty who were hired at the rank of assistant, associate, or full professor but were not tenure eligible (N=6) were excluded from all new hire analyses.

Descriptive statistics of all new tenure-track or tenured hires from 1996 to 2007

Over the past twelve years, Arts and Science has hired 396 tenured or tenure eligible faculty members. Of these, 129 have been female and 267 have been male. 79 have been minorities and 317 have not been minorities. 36 have been underrepresented minorities while 360 have not been underrepresented minorities. Counts of new hires are presented in Table 18.

Table 18: New hires by gender and minority status (Tenured and tenure eligible faculty)

| | Gender | | Minority | | Underrepresented Minority | |
	Male	Female	Yes	No	Yes	No
Total new hires 1996 to 2007 (N=396)	267 (67%)	129 (33%)	79 (20%)	317 (80%)	36 (9%)	360 (91%)
New hires 2002 to 2007 (N=219)	144 (66%)	75 (34%)	38 (17%)	181 (83%)	13 (5%)	206 (94%)
New hires 1996 to 2001 (N=177)	123 (70%)	54 (30%)	41 (23%)	136 (77%)	23 (13%)	154 (87%)

Breaking down new hires into two six year cohorts, one from 1996 to 2001 and the other from 2002 to 2007 allows for a comparison of demographics over time. From 1996 to 2001, 30% of new hires were female, while from 2002 to 2007 34% were female. From 1996 to 2001, 23% of new hires were minorities, while from 2002 to 2007 17% of new hires were minorities. 13% of new hires were underrepresented minorities from 1996 to 2001, and 5% of new hires were underrepresented minorities from 2002 to 2007.

Starting rank analysis

Table 19: Starting rank by hiring cohort, by gender and minority status (Tenured and tenure eligible faculty)

| | Gender | | Minority | | Underrepresented Minority | |
	Male	Female	Yes	No	Yes	No
2002 to 2007 (N=219)						
Assistant (N=109)	73 (67%)	36 (33%)	20 (18%)	89 (82%)	4 (4%)	105 (96%)
Associate without tenure (N=10)	5 (50%)	5 (50%)	3 (30%)	7 (70%)	1 (10%)	9 (90%)
Associate with tenure (N=32)	19 (59%)	13 (41%)	10 (31%)	22 (69%)	6 (19%)	26 (81%)
Full (N=68)	47 (69%)	21 (31%)	5 (7%)	63 (93%)	2 (3%)	66 (97%)
1996 to 2001 (N=177)						
Assistant (N=87)	58 (67%)	29 (33%)	28 (32%)	59 (68%)	12 (14%)	75 (86%)
Associate without tenure (N=14)	8 (57%)	6 (43%)	2 (14%)	12 (86%)	2 (14%)	12 (86%)
Associate with tenure (N=16)	12 (75%)	4 (25%)	4 (25%)	12 (75%)	3 (19%)	13 (81%)
Full (N=60)	45 (75%)	15 (25%)	7 (12%)	53 (88%)	6 (10%)	54 (90%)

Table 19 presents counts of new hires by rank. Chi-square analyses were conducted to test whether or not gender, minority status, and underrepresented minority status were associated with starting rank. First, these analyses were conducted for the overall population of new hires. Next, these analyses were conducted in each hiring cohort.

Starting rank was not associated with gender overall or in either hiring cohort (1996 to 2007: χ^2=3.28, p=0.35, 1996 to 2001: χ^2=2.42, p=0.49, 2002 to 2007: χ^2=2.09, p=0.55).

Overall and in each cohort, starting rank was significantly associated with minority status (1996 to 2007: χ^2=14.05, p<0.01 1996 to 2001: χ^2=9.08, p<0.05, 2002 to 2007: χ^2=10.24, p<0.05). In the overall counts (1996 to 2007), minorities were overrepresented in the associate professor with tenure rank (14 observed versus 9 expected under independence) and underrepresented at the professor rank (12 observed versus 25 expected under independence).

Fisher's exact test was used to test the null hypothesis of no relationship between starting rank and underrepresented minority status. In the overall cohort, there may be a trend regarding underrepresented minority status and starting rank (1996 to 2007: p=0.07). In the 1996 to 2001 cohort, we cannot reject the null hypothesis, there is no relationship between underrepresented minority status and starting rank (1996 to 2001: p=0.79). In the 2002 to 2007 cohort, starting rank was significantly associated with underrepresented minority status (2002 to 2007: p<.05). In 2002 to 2007, underrepresented minorities are overrepresented in the associate professor with tenure rank (6 observed versus 2 expected under independence) and underrepresented in the professor rank (2 observed versus 4 expected under independence).

Starting salary analysis

In the following analysis, 2 faculty members were missing starting salary information due to incomplete faculty records. Therefore N=394 in the starting salary analysis.

Table 20: Linear regression of log starting salary (Tenured and tenure eligible faculty)

	1996-2007	
	Reduced model	Full model
Intercept	11.38 (0.026)***	11.57 (0.056)***
Female	-0.13 (0.045)***	0.02 (0.021)
Starting Rank		
Assistant		-0.79 (0.021)***
Associate without tenure		-0.58 (0.042)***
Associate with tenure		-0.38 (0.032)***
Department†		***
Year of hire		0.03 (0.003)***
R^2	0.02	0.85
N	394	394

Notes: Standard errors are in parentheses. ***p<.01 **p<.05 *p<.10
†Due to the number of dummy variables, only the overall significance of the variable department is shown.

A linear regression model on log starting salary was constructed to test the relationship between log starting salary and gender for new hires (Table 20). In the reduced model, female is a negative predictor of log starting salary. Without controls, females have on average .13 units less log starting salary than males. However, after controlling for starting rank, department, and year of hire, gender is no longer a significant predictor of log starting salary. Instead, rank, department, and year of hire appear to explain the majority of the variance in log salary. Comparison of the R-squared measures from the

reduced and full models shows that adding these controls significantly improves the model.

Starting rank, department, and year of hire are significant predictors of log starting salary. For instance, assistant professors start, on average, at .79 units less log salary than full professors; associate professors without tenure start, on average, at .58 units less log salary compared to full professors; associate professors with tenure start, on average, at .38 units less log salary compared to full professors, holding all else constant. Additionally, for every one unit increase in year of hire, log starting salary increases by .03 units, on average, holding gender, rank, and department constant.

Short-list analysis

There were 330 short lists available for open academic positions that led to a new hire from 1996 to 2007. 73 (22%) of these short lists had no female finalists while 30 (9%) of these short lists had no male finalists. Females accounted for 50% or more of the members of the short list finalists in 108 cases (33%), while 222 short lists were more than 50% male.

Of the 330 positions, 15 had no female applicants and 9 had no male applicants. Females comprised 50% or more of the applicants for 68 of the 330 positions (21%). Males comprised more than 50% of the applicants for 262 of the 330 positions.

The following charts provide a visual relationship of the association between the proportion of females on short lists and the proportion of females hired for each department. The charts are organized by cohort, including 1996 to 2001 (Figure 16) and 2002 to 2007 (Figure 17). In both of these charts, the area of bubble is proportional to the count of total hires by each department.

Figure 16: Proportion of females on short list by proportion hired (1996 to 2001)
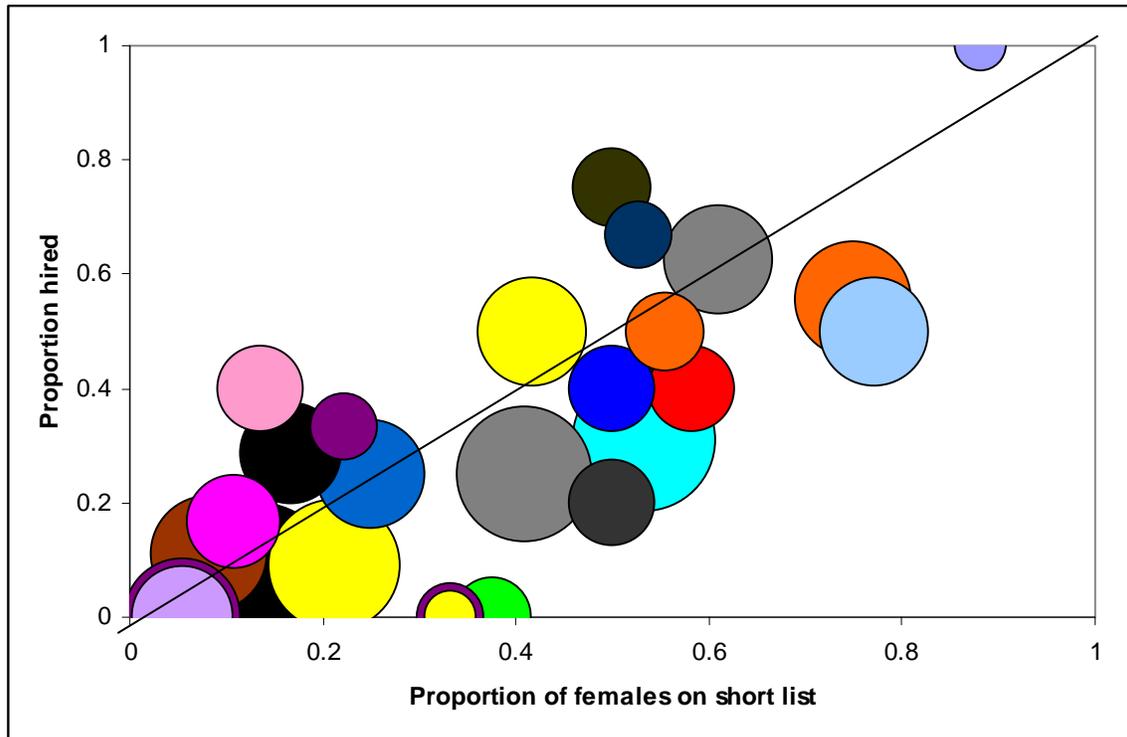
Notes: 5 departments with no females on their short lists are excluded...

Figure 17: Proportion of females on short list by proportion hired (2002 to 2007)
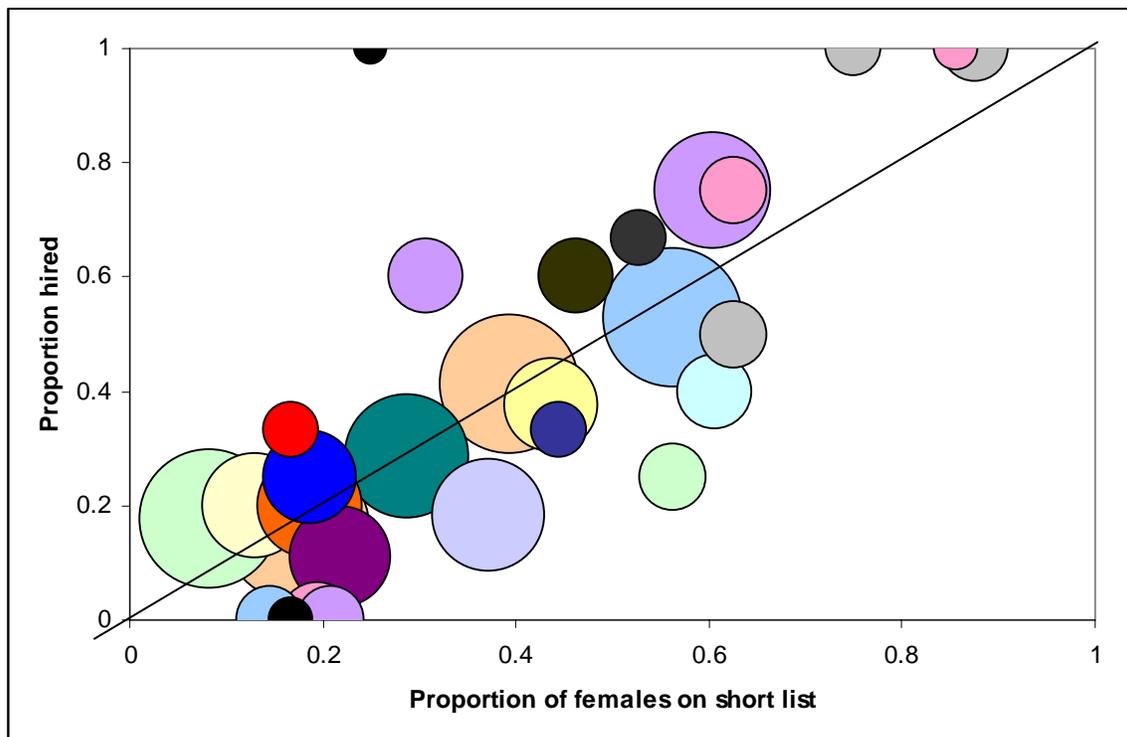
Notes: All 29 departments with new hires are included.

A logistic regression model controlling for the division of the position shows that the proportion of females on a short list impacts whether or not a female applicant is hired (Table 21).

Table 21: Logistic regression of female applicant hired from 330 short lists (Tenured and tenure eligible faculty)

	Female applicant hired
Intercept	-3.54 (.419)***
Proportion females on short list	6.15 (.752)***
Division	
Science vs. Social science	-0.337 (.267)
Humanities vs. Social science	0.217 (.233)*

Notes: Standard errors are in parentheses. ***p<.01 **p<.05 *p<.10

Part IV: Tenure decisions and tenure process

Description of the data in Part IV

Two cohorts of tenure-eligible new hires were constructed for the tenure decisions and tenure process analysis. The 1996-2001 new hire cohort (N=105) consisted of tenure eligible faculty hired between 6/1/1995 and 2/1/2001. The 2002-2007 new hire cohort (N=115) consisted of tenure-eligible faculty hired between 7/1/2001 and 4/2/2007. These two cohorts were also combined for some tenure decisions and tenure process analyses to represent all tenure-eligible new hires from the past 12 years (N=220).

Descriptive statistics of tenure results of tenure-eligible new hires

Figure 18 visually depicts the 2007 tenure status of all individuals who were hired as tenure-eligible faculty in the last twelve years. Figure 19 shows the 2007 status of all individuals who were hired as tenure-eligible faculty between 1996 and 2001. Figure 20 shows the 2007 status of faculty who were hired as tenure-eligible between 2002 and 2007.

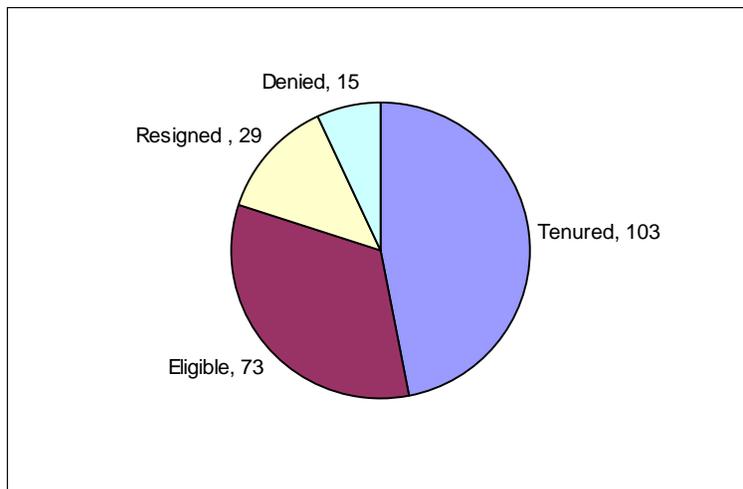**Figure 18: 2007 Status of tenure eligible new hires (1996 to 2007)**

Figure 19: 2007 Status of tenure eligible new hires (1996 to 2001 cohort)
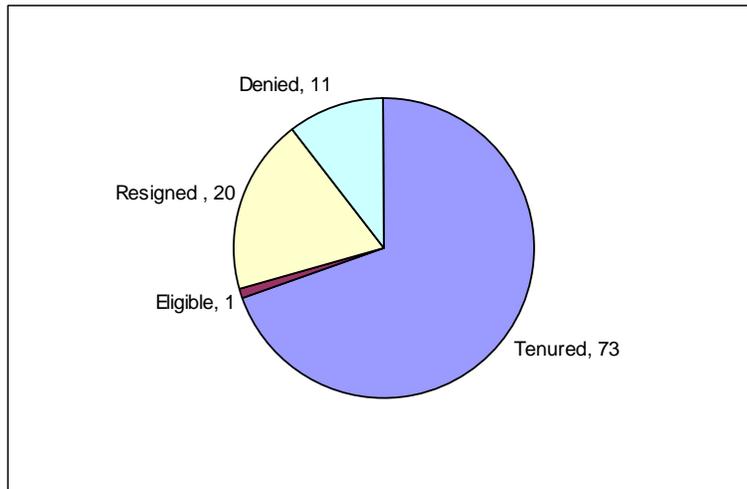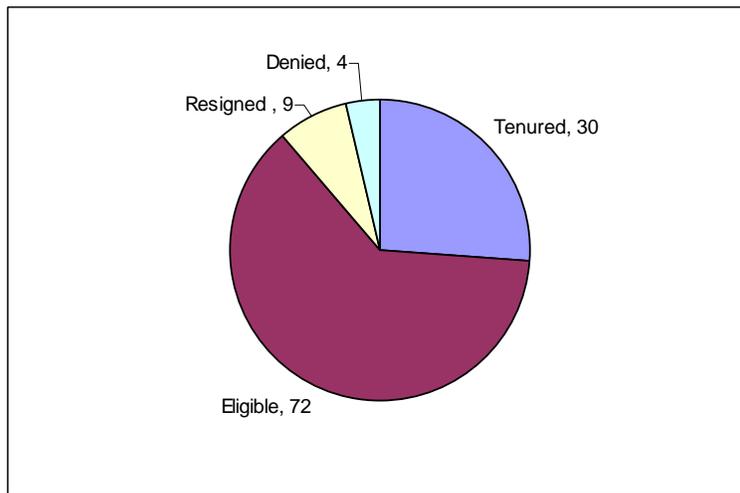

Figure 20: 2007 Status of tenure eligible new hires (2002 to 2007 cohort)

Tenure denied or granted

Out of the 220 tenure-eligible hires from 1996 to 2007, 118 individuals (54%) have been reviewed for tenure as of academic year 2007. 87% were granted tenure and 13% were denied tenure. The decision of whether or not to deny or grant tenure was not associated with gender (χ^2=1.25, p=0.26), minority status (χ^2=0.04, p=0.84), or underrepresented minority status (χ^2=1.08, p=0.30).

Out of the 105 tenure-eligible hires from 1996 to 2001, 84 individuals were reviewed for tenure. 87% were granted tenure and 13% were denied tenure. The two-tailed Fisher's exact test shows that the decision of whether or not to deny or grant tenure is not associated with gender (p=0.50), minority status (p=1.00), or underrepresented minority status (p=0.65) for this cohort of hires.

Out of the 115 tenure-eligible hires from 2002-2007, 34 have been reviewed for tenure as of academic year 2007 with an 88% success rate. To date, the two-tailed Fisher's exact test shows that the decision of whether or not to deny or grant tenure has not been associated with gender (p=0.58), minority status (p=0.41), or underrepresented minority status (p=0.23).

1996 to 2001: tenure denied, tenure granted, or resigned

Out of the 105 tenure-eligible hires from 1996 to 2001, 104 individuals have been denied tenure, granted tenure, or have resigned as of 2007. This cohort has nearly complete information regarding outcomes of the tenure process. Male and female in this cohort have very similar outcomes regarding tenure decisions. For example, 70% of males and 68% of females who were hired in this cohort have achieved tenure as of 2007. The similar distribution of outcomes for male and female tenure-track faculty in this cohort is visually depicted in figures 21 and 22:

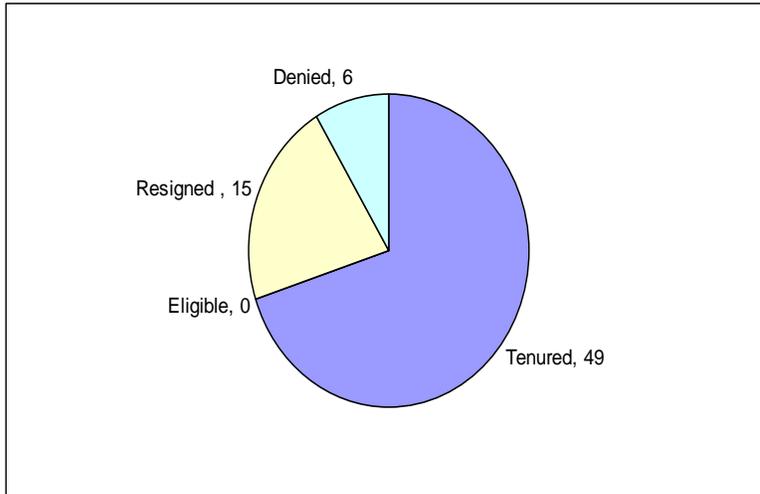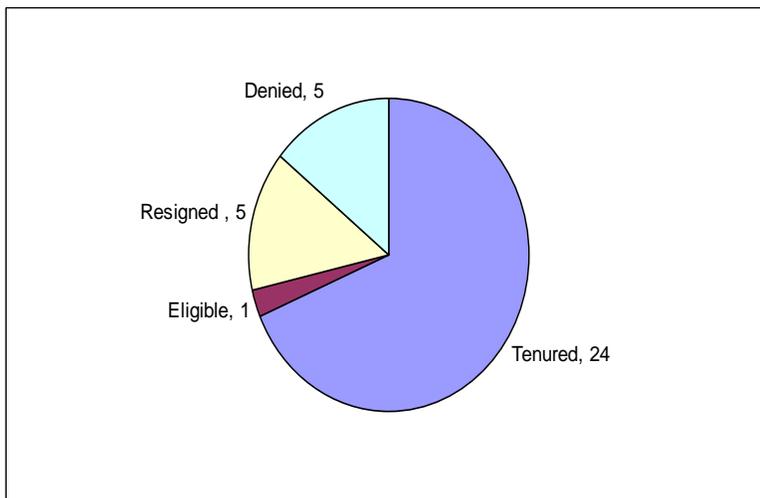**Figure 21: 2007 Status of male tenure eligible new hires (1996 to 2001)**

Figure 22: 2007 Status of female tenure eligible new hires (1996 to 2001)

Resignation before tenure review

Of the 220 tenure-eligible hires from 1996 to 2007, 29 resigned before their tenure review. 9 of these had a record indicating that they left because of a negative or potentially negative review. The bivariate association between resigning for a negative reason and gender, minority status, and underrepresented minority status (respectively) were tested with Fisher's exact tests. Gender (p=0.67), minority status (p=0.63), and underrepresented minority status (p=1.00) were not associated with resigning for a negative reason in the overall 1996 to 2007 data.

As of 2007, for the tenure-eligible new hires (1996 to 2007) that resigned before review, female faculty resigned, on average, at 4.63 years while male faculty resigned on average at 4.20 years. These means are not significantly different, (t=0.67 p=0.51).

Of the 105 tenure-eligible hires in the 1996 to 2001 cohort, 20 resigned before their tenure review. 9 of these had a record indicating that they left because of a negative or potentially negative review while 11 left for other reasons. Fisher's exact tests for this cohort reveal that gender (p=0.62), minority status (p=0.32), and underrepresented minority status (p=0.48) were not associated with resigning for a negative reason.

For the tenure-eligible hires in the 1996 to 2001 cohort that resigned before review, female faculty resigned, on average, at 5.60 years while male faculty resigned on average at 4.40 years. These means are significantly different (t=2.45 p=0.02). Female faculty who resigned before tenure review in this cohort did so about 1.2 years later than male faculty, on average.

Resignation statistics cannot be calculated for the 2002-2007 new-hire cohort, due to the small number of resignations to date.

Early tenure decisions

Table 22: Early tenure decisions by gender (Tenured and tenure eligible faculty)

Year of hire	Number of tenure eligible new hires	Early tenure by 2007	Early tenure females	Early tenure males
1996 to 2007	220	31	9	22
2002 to 2007	115	15	5	10
1996 to 2001	105	16	4	12

Of the 220 tenure-eligible new hires from 1996 to 2007, 103 have been granted tenure as of 2007. Of these, 31 have been granted early tenure. Table 22 shows counts of early tenure by hiring cohort and gender. A Chi square test was conducted to test whether or not the decision to grant early tenure as opposed to regular tenure was associated with gender (χ^2=0.18, p=0.67), minority status (χ^2=0.07, p=0.79), or underrepresented minority status (Fisher's exact p=0.50). This analysis indicates that the decision to grant early tenure is independent from gender, minority status, and underrepresented minority status.

Of the 105 tenure-eligible new hires from 1996 to 2001, 73 have been granted tenure as of 2007. Of these, 16 have been granted early tenure. The decision of whether or not to grant early tenure as opposed to regular tenure was not associated with gender (χ^2=0.58, p=0.45). Fisher's exact test also shows that the decision of whether or not to grant early tenure as opposed to regular tenure was not associated with minority status (p=0.54) or underrepresented minority status (p=1.00) in the 1996 to 2001 cohort.

Out of the 115 tenure-eligible hires from 2002 to 2007, 30 have been granted tenure as of academic year 2007. Of these, 15 have been granted early tenure. To date, the two-tailed Fisher's exact test shows that the decision of whether or not to deny or grant early tenure to members of this hiring cohort has not been associated with gender (p=1.00), minority status (p=1.00), or underrepresented minority status (p=1.00).

Survival until tenure

Table 23: Survival until tenure by gender (Tenured and tenure eligible faculty)

Year of hire	Number of tenure eligible new hires	Tenure by 2007	Tenure females	Tenure males
1996 to 2007	220	103	33	70
2002 to 2007	115	30	9	21
1996 to 2001	105	73	24	49

Table 23 shows counts of faculty who have received tenure by 2007. To date, faculty that were tenure-eligible upon hire (1996 to 2007) have taken anywhere from 2 to 8 years to achieve tenure, with 6.0 years as the median time until tenure. The median time to tenure for both male and female faculty members who have attained tenure to date is 6.0 years. The median time to tenure for faculty members who have attained tenure to date is 5.5 years for non-minority faculty and 6.0 years for minority faculty. The median time to tenure for both underrepresented minority and other faculty who have attained tenure to date is 6.0 years.

The survival distributions of male and female, minority and non-minority, and underrepresented minority and other faculty were compared using the log-rank test, to test the null hypothesis that there is no difference between survival strata. Observations were censored if they had not been reviewed by academic year 2007.

For 1996 to 2007 hires, 33 female faculty members have attained tenure to date and 43 female faculty members were censored. 70 male faculty members have attained tenure to date and 74 male faculty members were censored. The log-rank test shows no difference in the survival strata for male and female faculty (χ^2=0.07, p=0.79).

For 1996 to 2007 hires, 25 minority faculty members have attained tenure to date, while 28 were censored. 78 non-minority faculty members have attained tenure to date, while 89 were censored. The log-rank test shows no difference in the survival strata for minority and non-minority faculty (χ^2=0.01, p=0.91).

For 1996 to 2007 hires, 11 underrepresented minority faculty members have attained tenure to date, while 8 were censored. 92 other faculty members have attained tenure to date, while 109 were censored. The log-rank test shows no difference in the survival strata for underrepresented minority and non- underrepresented minority faculty (χ^2=0.04, p=0.83).

Similar survival analyses were conducted for the 1996 to 2001 and 2002 to 2007 new hire cohorts. However, in both cohorts, gender, minority status, and underrepresented minority status were not significantly associated with survival until tenure. Results of the log-rank test for the 1996 to 2001 cohort include: χ^2=0.30, p=0.59 for gender survival distributions, χ^2=0.37, p=0.54, for minority status survival distributions, and χ^2=0.01, p=0.93, for underrepresented minority status survival distributions. Results of the log-rank test for the 2002 to 2007 cohort include: χ^2=0.26, p=0.61 for gender survival distributions, χ^2=0.19, p=0.66, for minority status survival distributions, and χ^2=0.13, p=0.72, for underrepresented minority status survival distributions.