

**Analysis of Gender Differences in 2006 Faculty Startup Packages at UCI**

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In 2005 and 2006, we reported on gender equity in faculty start-up packages for new hires. These reports collected all offer letters for tenured and tenure-tracked jobs beginning in each of the previous academic years (fall 2004 and 2005). We coded these for the various perks that were offered upon hiring, analyzed gender differences, and beginning with the 2006 report, compared them to the prior year's findings in order to assess change over time. We continue this effort here by adding the data for the 2006/2007 academic year. Following is a list of means by gender for various factors in startup packages, 2004 -2006.

**Table 1. Means for Female and Male Hires for Various Factors in 2004 - 2006 Startup Packages (All Schools) (Dollar amounts in thousands).**

	2004		2005		2006	
	Female (N)	Male (N)	Female (N)	Male (N)	Female (N)	Male (N)
Step-level <sup>1</sup>	<b>5.24</b> (27)	<b>6.53</b> (37)	<b>5.66</b> (24)	<b>7.35</b> (20)	4.76 (21)	5.45 (29)
Salary	82.3 (27)	106.0 (36)	80.7 (24)	101.2 (19)	90.1 (21)	118.8 (34)
Summer Compensation	<b>11.8</b> (27)	<b>14.0</b> (37)	<b>2.5</b> (13)	<b>16.8</b> (18)	7.4 (22)	7.3 (34)
Number Months Summer comp.	<b>1.56</b> (27)	<b>1.68</b> (37)	<b>0.307</b> (13)	<b>1.11</b> (18)	1.1 (22)	1.3 (34)
Admin. Assistance <sup>2*</sup>	0.15 (27)	0.24 (37)	0.04 (24)	0.0 (20)	0.1 (21)	0.1 (33)
% Spouses Helped by Career partners Programs	0.04 (27)	0.05 (37)	0.04 (24)	0.1 (20)	0.1 (21)	0.2 (34)
Total Course Load	3.86 (18)	3.94 (18)	4.40 (15)	4.15 (13)	4.5 (12)	4.25 (18)
Course Relief	3.07 (21)	2.67 (18)	1.277 (18)	2.00 (12)	1.9 (15)	1.6 (15)
First 3 yrs	3.07 (21)	2.67 (18)	1.277 (18)	2.00 (12)	1.9 (15)	1.6 (15)
Housing loans Offered Home in University Hills <sup>3*</sup>	0.74 (27)	0.68 (37)	0.708 (24)	0.65 (20)	1.2 (21)	0.7 (34)
	0.22 (27)	0.38 (37)	0.292 (24)	0.20 (20)	0.33 (21)	0.4 (34)
<b>Housing Allowance</b>	23.7 (4)	44.0 (2)	28.5 (8)	33.1 (7)	8.5 (21)	10.2 (32)
<b>Startup package<sup>4</sup></b>	179.5 (25)	684.5 (36)	145.1 (23)	228.1 (19)	<b>114.4</b> (21)	<b>270.6</b> (34)
<b>Total Bonus<sup>5</sup></b>	215.0 (25)	743.0 (36)	176.1 (23)	278.1 (19)	<b>132.2</b> (13)	<b>398.6</b> (17)

\*Results in bold are statistically significant differences using t-tests. For dichotomous variables, numbers reported are proportions and significance for 2006 is determined by Fisher's exact test. None of the dichotomous variables were significant.

<sup>1</sup> Step/level refers to a composite measure of rank that combines the UC Assistant/Associate/Professor ranks with the steps within each rank. This composite theoretically ranges from 1, for a step-1 Assistant Professor, to 17, for an off-scale Professor. The measure accounts for overlaps between Assistant and Associate Professors—and Associate and Full Professor overlaps—of equivalent salaries. These equivalent overlaps occur for Assistant Professor at steps 5 and 6 with Associate Professors at steps 1 and 2. They also occur for Associate Professors of steps 4 and 5 with Full Professors of steps 1 and 2.

<sup>2</sup> Any mention of administrative assistant vs. none.

<sup>3</sup> The housing loans were coded “no mention,” “mention,” and “dollar amount specified.”

<sup>4</sup> Startup package is the money guaranteed by the school in addition to the summer compensation and housing allowance which is intended to help establish faculty members’ research programs.

<sup>5</sup> Total bonus is calculated by adding summer compensation, housing allowance, and startup package

Whereas in 2004 and 2005, there were substantive and significant<sup>1</sup> gender differences in step-level and summer compensation, in 2006, these differences largely disappeared. In 2006, female means were marginally higher than male means for the dollar amount of summer compensation (gender gap=\$64), and the number of months of summer compensation was generally the same (gender gap=.3). For the first time in three years, males were hired at approximately at the same average step-level as females (gender gap=.72). we find new significant differences in startup amounts and total bonus amounts. On average, male faculty recruits received significantly more startup funds (in fact, more than double the female amount, gender gap=\$156,196). Likewise, male recruits received significantly more total bonus (the sum of summer compensation, housing allowance and startup funds), this time, more than triple the amount that female recruits received (gender gap=\$266,454). While these differences are not explained by differences in step-level, they may be accounted for by which schools did the hiring. This is because we know that schools in the hard sciences routinely offer higher startup packages. This Table 2 reports differences in salary, startup and total bonus by school.

**Table 2. Mean Salary, Startup and Total Bonus by School**

	Mean Salary	N	Mean Startup	N	Mean Total Bonus	N
<b>Science and Engineering</b>						
Engineering	104783.33	6	580317.50	6	673492.11	5
Biological Sciences	NA	1	NA	1	NA	1
Information and Computer Science	NA	0	NA	0	NA	0
Physical Sciences	100000.00	4	778750.00	4	791250.00	4
<b>Other Schools</b>						
Education	60633.33	3	36911.11	3	73474.08	3
Medicine	228374.29	7	435000.00	6	NA	0
Social Ecology	60000.00	2	55000.00	2	50000.00	1
Arts	62100.00	6	28333.33	6	NA	0
Graduate School of Management	205750.00	4	32375.00	4	96097.22	4
Social Sciences	73671.43	7	72142.86	7	72142.86	7
Humanities	88416.67	12	18250.00	12	39222.22	3
Health Sciences	61966.67	3	160166.67	3	142750.00	2
Total	108153.10	55	209845.20	54	283181.30	30

<sup>1</sup> Since we have the population of startup letters for 2005, we use tests of statistical significance only as a rough guide for determining substantive differences in the population. Yet with small N’s, sometimes fairly large differences can fail to meet the test of significance.

Specific allocations of space were rarely mentioned in the offer letters, although space is a salient issue in many departments. The following list provides information for the four individuals who were specifically offered space by gender, rank and school.

<b>Gender</b>	<b>Rank</b>	<b>School</b>	<b>Received</b>
male	Assistant	Medicine	400 square feet
male	Associate	Medicine	930 square feet
male	Assistant	Engineering	850 square feet
female	Assistant	Medicine	400 square feet

Because outliers sometimes unduly influence means, it is prudent to also consider medians. Below are medians for the same variables in Table 1 for 2006. We find that the differences are similar when considering the medians.

**Table 3. Medians for Female and Male Hires for Various Factors in 2006 Startup Packages (All Schools).\***

	<b>Female</b>	<b>(N)</b>	<b>Male</b>	<b>(N)</b>
Step-level*	3.00	(21)	3.00	(29)
Salary (\$)	70,000	(21)	74,160	(34)
Summer compensation (\$)	0.00	(22)	0.00	(34)
Months Summer comp.	0.50	(22)	0.50	(34)
Total Course Load	4.50	(12)	4.00	(18)
Course Relief first 3 yrs	2.00	(15)	1.00	(15)
Housing loans	1.00	(21)	1.00	(34)
<b>Housing Allowance (\$)</b>	0.0	(21)	0.0	(32)
<b>Startup package (\$)</b>	30,000	(21)	95,000	(33)
<b>Total initial bonus(\$)</b>	68,000	(13)	270,000	(17)

\* We ran two-sample Wilcoxon test (also known as a Mann-Whitney test) on the data, which is distribution-free in that it ranks the data and tests the differences in these ranks between two samples. It is comparable to the t-tests performed for Table 1 and provides estimates on the median difference between each possible pair of men and women in the study. Overall, we found effects similar to those found in Table 1, where both the startup packages and the total bonuses offered tend to favor men over women by roughly \$30,000 and \$175,000 respectively.

In order to compare differences over time, Table 4 shows the gender gaps for selected variables over the last three years.

**Table 4. Gap in Components of Startup Package (All Schools) (Mean<sub>f</sub> – Mean<sub>m</sub>)**

	<b>2004</b>	<b>2005</b>	<b>2006</b>
	<u>Gender Gap</u>	<u>Gender Gap</u>	<u>Gender Gap</u>
Step-level	-1.29	-1.69	-.686
Salary	-\$23,697	-\$20,468	-\$27,840
Summer Compensation	-\$2,212	-\$14,344	+\$64
Months Summer Compensation	-.12	-.80	-0.26
<b>Startup Package</b>	-\$505,000	-\$227,961	-\$156,196
<b>Total initial bonus</b>	-\$527,463	-\$101,990	-\$266,454

The gender gap in salary has increased slightly since 2005. While the gender gap in the dollar amount of the startup package has fallen drastically, the gap in the total initial bonus has considerably increased since 2005. The gap in the dollar amount of summer compensation and the number of months of summer compensation have both reduced to effective equity. The gender gap in step-level at hire is lower than it was in 2004 and 2005. This is due to a considerable decrease in male step/level at hire, which is approaching the female mean. Now that we have near equity in step-level of recruits across gender, differences in step-level cannot explain any other gender differences in characteristics of the startup packages.

Because there are differences in availability of females for certain fields, and the levels of female availability has increased over time for some fields, hiring at the Assistant Professor level (where females are more available) has the potential to improve gender equity in hiring, salaries, and in startup packages. Yet we don't observe a marked improvement over this particular year. We may see observe these changes over a longer timeframe.

Next we consider if and how the components of female startup packages have changed between 2004 and 2006. Table 5a compares aspects of female hires' startup packages 2004 through 2006.

**Table 5a. Trends in Components of Startup Packages, 2004 through 2006 (All Schools – Women Only)**

	<b>2004</b>	<b>2005</b>	<b>2006</b>
Step-level	5.241	5.667	4.762
Salary	\$82,322	\$80,720	\$90,942
Summer compensation	\$11,785	\$2,488	\$7,374
Months Summer compensation	1.555	0.308	1.091
Total Course Load	3.861	4.400	4.500
Course Relief in first 3 years	3.071	1.277	1.867
Housing loans	0.740	0.708	1.190
<b>Housing Allowance</b>	\$23,750	\$28,537	\$8,542
<b>Startup package</b>	\$179,448	\$145,066	\$114,392

During this three year period, female hires have averaged around the 5<sup>th</sup> step/level (which is at the top of the Assistant Professor rank). Their 2006 mean salary is about 13% higher than their 2005 mean salary (but only 10% higher than their 2004 mean salary). Mean summer compensation is about three times higher than 2005 summer compensation, but only 63% of 2004 mean summer compensation. The latter differences are reflected in the mean number of summer months also. Mean course load has risen over the three years, and mean course relief has declined since 2004. We see more housing loans in 2006, but significantly lower amounts of housing allowance. And mean startup packages have dropped

consistently. Overall, female hires have lost ground with regard to the dollar amount of the startup package and the housing allowance, and they gained ground on starting salary, the number of summer months, summer salary, course release and housing loans. But only starting salary and housing loans constitute an improvement over 2005 levels. How does this compare to the trajectory of these variables with regard to male hires? Table 5b shows the changes for male hires.

**Table 5b. Trends in Components of Startup Packages, 2004 through 2006 (All Schools – Men Only) (Dollar amounts in thousands)**

	<b>2004</b>	<b>2005</b>	<b>2006</b>
Step-level	6.527	7.350	5.448
Salary	106,019	101,189	118,782
Summer compensation	13,997	16,833	7,310
Months of Summer compensation	1.676	1.111	1.353
Total Course Load	3.944	4.153	4.25
Course Relief in first 3 years	2.666	2.000	1.6
Housing loans	0.676	0.650	0.735
<b>Housing Allowance</b>	44,000	33,142	10,187
<b>Startup package</b>	684,448	228,107	270,588

During 2006, male hires entered at a lower mean step/level. Whereas in 2005 they entered at an average step of 7.35, in 2006, they entered at an average of 5.4. This places the mean male hire at the closest point on the step/level scale to the female average in the last three years. The mean male salary increased to 117% of its 2005 mean, while the female mean salary increased to 113% its 2005 level. Male mean summer compensation decreased considerably, bringing it into line with the female mean in 2006. While up slightly from 2005, the male mean housing loan is still lower than the female mean. Like the female mean, housing allowance is considerably down from 2005. While the female mean startup package has declined over each of the last two years, the male mean startup package increased since 2005, thereby widening the 2005 gap almost twofold (but this gap is still considerably lower than the 2004 gap).

### **Patterns in Non-Science and Engineering Schools**

In prior analyses, we considered the same analyses for Science and Engineering schools only. Yet because we have so few startup packages for Science and Engineering schools in 2006, we opt for a different strategy: to report on non-Science and Engineering schools, and compare them to the aggregate analyses of all schools. This strategy give us a glimpse of how the Science and Engineering hires change the overall picture. Table 6 provides means for characteristics of 2004 - 2006 start-up packages by gender for non-Science and Engineering schools.

**Table 6. Means for Female and Male Hires for Various Factors in 2006 Startup Packages, Comparing All Schools to Non-Science and Engineering Only (Dollar amounts in thousands).**

	All Schools				Non-Science and Engineering only			
	Female	(N)	Male	(N)	Female	(N)	Male	(N)
Step-level <sup>1</sup>	5.00	(21)	5.72	(29)	4.85	(20)	5.33	(21)
Salary	90.1	(21)	118.8	(34)	92.1	(20)	125.7	(24)
Summer comp	7.4	(22)	7.3	(34)	7.7	(21)	6.4	(24)
Months Sum comp	1.1	(22)	1.3	(34)	1.0	(21)	0.7	(24)
Admin assistance <sup>2</sup>	0.1	(21)	0.1	(33)	0.1	(20)	0.1	(23)
Career partners	0.1	(21)	0.2	(34)	0.15	(20)	0.25	(24)
Total Course Load	4.5	(12)	4.25	(18)	4.50	(12)	4.25	(17)
Course Relief	1.9	(15)	1.6	(15)	1.87	(15)	1.57	(14)
Housing loans (mean)	1.2	(21)	0.7	(34)	1.2	(20)	0.79	(24)
Offered home	0.33	(21)	0.4	(34)	0.30	(20)	0.29	(24)
<b>Housing Allowance</b>	8.5	(21)	10.2	(32)	7.2	(20)	4.5	(23)
<b>Startup package</b>	114.4	(21)	270.6	(34)	75.6	(20)	122.7	(23)
<b>Total Bonus</b>	132.2	(13)	398.6	(17)	69.0	(12)	91.8	( 8)

<sup>1</sup> Step/level refers to a composite measure of rank that combines the UC Assistant/Associate/Professor ranks with the steps within each rank. This composite theoretically ranges from 1, for a step-1 Assistant Professor, to 17, for an off-scale Professor. The measure accounts for overlaps between Assistant and Associate Professors—and Associate and Full Professor overlaps—of equivalent salaries. These equivalent overlaps occur for Assistant Professor at steps 5 and 6 and Associate Professors at steps 1 and 2. They also occur for Associate Professors of steps 4 and 5 and Full Professors of steps 1 and 2.

<sup>2</sup> Dichotomous: Some admin assist vs. none.

Since there were very few female hires in Science and Engineering in our data, the female means for all schools and for non-Science and Engineering only are very similar, with two exceptions. The non-Science and Engineering schools offered lower startup packages and housing allowances. These two differences are replicated for male hires. It is also important to note that the significant effects observed in Table 1 are no longer present when we remove the Science and Engineering hires from the data. This suggests that the inequity by gender observed earlier resulted from the relatively large startup packages and total bonuses in Science and Engineering schools coupled with a relative absence of female hires there.

Again, we provide medians for 2006 for comparison (Table 7).

**Table 7. Medians for Female and Male Hires for Various Factors in 2006 Startup Packages (All Schools and Non-Science and Engineering Only) (Dollar amounts in thousands).**

	All Schools				Non Science and Engineering Only			
	Female	(N)	Male	(N)	Female	(N)	Male	(N)
Step-level	3	(21)	3	(29)	3	(20)	3	(21)
Salary (\$)	70.0	(21)	74.2	(34)	71.0	(20)	72.9	(24)
Summer compensation (\$)	0	(22)	0	(34)	0	(21)	0	(24)
Months Summer comp.	0.50	(22)	0.50	(34)	0	(21)	0	(24)
<b>Startup package (\$)</b>	30.0	(21)	95.0	(33)	30.0	(20)	40.0	(23)
Total Course Load	4.5	(12)	4.0	(18)	4.5	(12)	4	(17)
Course Relief first 3 yrs	2.0	(15)	1.00	(15)	2	(15)	1	(14)
<b>Housing Allowance (\$)</b>	0	(21)	0	(32)	0	(20)	0	(23)

The medians show a somewhat different picture. Median female startup packages for non-Science and Engineering are the same as for all schools, but the median for males is considerably higher in Science and Engineering (indicated by a lower median for non-Science and Engineering schools). This is due to the fact that we add ten cases to non-Science and Engineering to get the total for all schools. Adding these 10 Science and Engineering males considerably increases the median male startup amount.

### Regression Models

In order to untangle the determinants of the differences we have observed, we now turn to regression models. Table 8 provides regression models of aspects of startup packages (logged) for all schools.

**Table 8. Regression on Logged Salary Offered (all schools).**

<u>Variables</u>	<u>Beta</u>	<u>t</u>
Gender	0.015	0.200
Step/Level	0.071	6.750***
Medicine	0.777	7.000***
Business	0.629	4.167***
Arts	-0.238	-2.020*
Constant	10.9089	0.076***

R-squared= 0.7852

Adjusted R-squared= 0.7602

\*Significant at the 0.05 level.;\*\*\*Significant at the .001 level

Like in past analyses, gender is not a significant predictor of salary offered, and step-level is a significant predictor. Again, the business school and School of Medicine offered higher salaries, and in 2006, and salaries were lower in the school of the Arts. These results indicate that when controlling for step/level and school, there are no gender differences. But as we saw in Table 1, female faculty are hired at lower salaries than male faculty, and we saw in Table 2 that schools differ considerably in their average salaries. So school is a possible “intervening variable,” that explains gender differences. That is, gender distributions in the schools themselves are related to both gender and salary, and those



associations may partly explain why some schools offer higher salaries than others. The gender distributions for 2006 in the schools that produce higher salaries are 20% female for Medicine and 32.6% female for Business, and for the school with significantly lower salaries, such as Arts, it is 39.7% female. Among our hires this year, 12.5% of the hires in Medicine, 7.1% of the hires in Business and 10.7% of the hires in Arts were female. While these differences do not strongly conform to our expectations, it is clear that the schools populated largely by females. (Health Sciences with 50%, Education with 67%, Humanities with 48.5%, and Social Ecology with 43.9% female) are among the schools that offer the lowest entering salaries (\$61,966, \$60,633, \$88,416, \$60,000 respectively).

**Table 9. Regression on Logged Startup Package (all schools).**

<b>Variables</b>	<b>Beta</b>	<b>t</b>
Gender	0.350	1.334
Step/Level	0.009	0.255
Humanities	-1.434	-4.259***
Physical Science	2.409	4.956***
Medicine	1.975	4.972***
Constant	10.722	41.385***

R-squared= 0.6827

Adjusted r-squared= 0.6449

\*\*\*Significant at the .001 level

Importantly, and like the regression models of previous years, Table 9 shows that gender and step/level are not significant determinants of the logged startup package. A slightly different mix of individual schools contributes to the differences in 2006 (higher salaries in Physical Sciences and Medicine and lower salaries in Humanities). Since startup packages are directly related to various research needs in the different schools, these differences are more likely responsive to those differences than a reflection of gender differences per se.

Next we consider regression models of logged total startup package dollar amount, summer funding, and housing allowance combined (total bonus).

**Table 10. Regression on Logged Total Bonus (all schools).**

<b>Variables</b>	<b>Beta</b>	<b>t</b>
Gender	-0.260	-1.423
Step/Level	0.044	2.267*
Physical Science	2.223	10.037***
Engineering	1.810	7.354***
Humanities	-0.999	-3.764**
Social Sciences	-0.550	-2.686*
Health Sciences	0.944	2.510*
Constant	11.126	68.290***

R-squared= 0.9373

Adjusted r-squared= 0.9130

\*Significant at the .05 level; \*\*Significant at the .01 level;\*\*\*Significant at the .001 level

The regression model of logged total bonus is similar to the one on startup package, with the major exception that the Step/Level is a significant predictor here. Holding gender and school constant, more senior scholars receive higher total startup bonuses.

## **Conclusion**

Our analysis of 2006 startup packages reveals that gender differences continue to exist in startup packages, but the gender of the individual-level hire did not account for those differences. Step-level is an important determinant of starting salary and total bonus, and institutional unit (school) also continues to matter. Institutional unit continues to be the only significant predictor of startup package. A significant change in 2006 over the previous years is that female hires were hired at roughly the same step-levels as males.

We also would like to note that with regard to the salaries offered to new hires, significant differences between schools may reflect differences in the gender makeup of those schools. The sociological literature on sex segregation in occupations demonstrates that there is a salary penalty to occupations that have a higher percent of female occupants. Differences in compensation to these fields may be ingrained in market rates, and thereby appear to be perfectly reasonable. But we might ask why a professor of the same gender and rank in the arts or in education deserves a significantly lower salary than one in engineering or business. As long as we use market value as the sole rationale to determine salaries, we continue to value skills normally attributed to males over those normally attributed to females.

Appendix: Population of Hires, 2004-2006.

School	2004			2005			2006		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>Sci &amp; Eng</b>									
Engineering	4	0	4	2	0	2	6	0	6
Biological Science	5	6	11	3	0	3	1	0	1
ICS	6	4	10	1	1	2	0	0	0
Physical Science	3	1	4	2	2	4	3	1	4
<b>Other</b>									
Education	1	1	2	0	2	2	0	3	3
Medicine	6	2	8	0	0	0	5	2	7
Social Ecology	2	1	3	1	2	3	2	0	2
Arts	0	3	3	1	6	7	3	3	6
Business	0	2	2	3	1	4	2	2	4
Social Sciences	5	2	7	5	5	10	3	4	7
Humanities	5	5	10	2	5	7	6	7	13
Health Sciences	NA	NA	NA	NA	NA	NA	2	1	3
<b>Total</b>	37	27	64	20	24	44	34	22	56