Report on Tenure Cohort Study
UM ADVANCE Program[1]
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At the request of the ADVANCE Steering Committee, the ADVANCE Program conducted a study to assess outcomes in terms of retention and promotion by gender and race-ethnicity for two cohorts of instructional track faculty hired as assistant professors at UM during two time periods: 1993-97 and 1998-2002. Outcomes were considered as of 2003 for the first cohort and 2008 for the second cohort; these dates were selected to allow sufficient time for new hires to be promoted.

For all faculty in these two cohorts we were able to determine the following three outcomes as of the date specified for each cohort:

- promoted to associate professor;
- left instructional track (e.g., resigned from UM, terminated, move to different track);
- still at the rank of assistant professor.

Frequencies by Race/Ethnicity and Gender
Table 1 provides percentage of all faculty in each these categories and within gender and race/ethnicity categories by cohort.

Table 1a: Outcomes for Two Cohorts of Assistant Professors by Gender and Race/Ethnicity

Hiring Cohort 1 (AY1993-AY1997)	**Total**			**White**		**URM**		**Asian**	
Outcomes as of 2003	**All**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**
	n=518	n=179	n=339	n=122	n=260	n=35	n=31	n=22	n=48
Promoted	56%	53%	58%	56%	58%	46%	58%	45%	56%
Left Track as Assistant Professor	38%	37%	39%	38%	38%	40%	42%	32%	42%
Still Assistant Professor	6%	10%	4%	7%	4%	14%	0%	23%	2%
Hiring Cohort 2 (AY1998-AY2002)									
Outcomes as of 2008	n=528	n=181	n=347	n=117	n=234	n=38	n=41	n=26	n=72
Promoted	59%	51%	63%	50%	63%	55%	59%	50%	63%
Left Track as Assistant Professor	39%	44%	36%	44%	35%	45%	39%	38%	38%
Still Assistant Professor	3%	6%	1%	6%	2%	0%	2%	12%	0%

These data suggest that the rate of promotion for the cohort hired in 1993-1997 was 56-58% for all groups, except underrepresented minorities (URMs) and Asian/Asian American females. For these groups, rates were somewhat lower (46% and 45%). These two groups were also quite small, and there were relatively high rates of individuals still at the rank of assistant professor (and thus perhaps ultimately promoted) for those two groups.

In contrast, rates of promotion for the later cohort (hired 1998-2002) were much more varied (ranging from a low of 50% to a high of 63%), and they were quite different by gender (a 12% difference overall,

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compared with a 5% difference for the first cohort), with all females having lower rates than counterpart males. The largest differences were for White and Asian females (13% for each), with URM females only 4% lower than URM males (who, however, had lower rates than White or Asian/Asian American males).

We examined these same data separately for the three largest schools (Engineering, LSA, and Medicine; see Tables 2a-c). Some differences by school appeared in these data, though in broad strokes results in LSA and the Medical School follow the pattern described overall. It should be noted that rates for URM and Asian/Asian American faculty are quite small for all three schools, so results for these groups should be interpreted very cautiously.

The College of Engineering (Table 2a) had very small numbers overall and even smaller numbers of women in each of the cohorts. That said, the first cohort had larger gender differences than the second, in contrast to the overall pattern reported above. Moreover, in the second cohort the rate of promotion for the very small number of women involved was if anything higher for Whites and Asians/Asian Americans than their counterpart men. Still, the most important point is that the numbers are quite small, compared with the other two schools.

Table 2a: Engineering Outcomes for Two Cohorts of Assistant Professors by Gender and Race/Ethnicity

Hiring Cohort 1 (AY1993-AY1997)	**Total**			**White**		**URM**		**Asian**	
Outcomes as of 2003	**All**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**
	n=40	n=10	n=30	n=7	n=17	n=1	n=2	n=2	n=11
Promoted	65%	50%	70%	57%	71%	0%	50%	50%	73%
Left Track as Assistant Professor	35%	50%	30%	43%	29%	100%	50%	50%	27%
Still Assistant Professor	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hiring Cohort 2 (AY1998-AY2002)									
Outcomes as of 2008	n=47	n=7	n=40	n=5	n=25	n=1	n=3	n=1	n=12
Promoted	77%	71%	78%	80%	72%	0%	100%	100%	83%
Left Track as Assistant Professor	23%	29%	23%	20%	28%	100%	0%	0%	17%
Still Assistant Professor	0%	0%	0%	0%	0%	0%	0%	0%	0%

The LSA data (Table 2b) for the first cohort appear overall roughly like the broader picture in Table 1, with roughly equal outcomes in the first cohort, and larger differences in the second, except for URM faculty. Rates of promotion for men in the second cohort range from a low of 63% (for URM men) to a high of 73% (for White men). In contrast, rates for women range from 50% (for White women) to 65% (for URM women). And both White women and Asian/Asian American women have substantially lower rates than their male counterparts (by 23% for White women and 7% for Asian/Asian American women).

Table 2b: LSA Outcomes for Two Cohorts of Assistant Professors by Gender and Race/Ethnicity

Hiring Cohort 1 (AY1993-AY1997) Outcomes as of 2003	**Total**			**White**		**URM**		**Asian**	
	All	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**
	n=131	n=48	n=83	n=34	n=61	n=8	n=10	n=6	n=12
Promoted	60%	58%	60%	59%	62%	63%	50%	50%	58%
Left Track as Assistant Professor	38%	40%	37%	41%	34%	38%	50%	33%	42%
Still Assistant Professor	2%	2%	2%	0%	3%	0%	0%	17%	0%
Hiring Cohort 2 (AY1998-AY2002) Outcomes as of 2008	n=180	n=84	n=96	n=48	n=62	n=26	n=16	n=10	n=18
Promoted	63%	56%	70%	50%	73%	65%	63%	60%	67%
Left Track as Assistant Professor	35%	42%	29%	46%	26%	35%	38%	40%	33%
Still Assistant Professor	2%	2%	1%	4%	2%	0%	0%	0%	0%

The Medical School data show higher rates of promotion for females in all groups in the first cohort, and relatively little variation by race-ethnicity. In the second cohort rates are higher for men in all groups, and much higher for White (by 19%) and Asian/Asian American (by 48%) men.

Table 2c: Medicine Outcomes for Two Cohorts of Assistant Professors by Gender and Race/Ethnicity

Hiring Cohort 1 (AY1993-AY1997) Outcomes as of 2003	**Total**			**White**		**URM**		**Asian**	
	All	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**
	n=201	n=50	n=151	n=38	n=129	n=7	n=7	n=5	n=15
Promoted	56%	64%	54%	63%	54%	71%	57%	60%	47%
Left Track as Assistant Professor	37%	24%	42%	29%	41%	14%	43%	0%	47%
Still Assistant Professor	6%	12%	5%	8%	5%	14%	0%	40%	7%
Hiring Cohort 2 (AY1998-AY2002) Outcomes as of 2008	n=143	n=36	n=107	n=27	n=78	n=4	n=7	n=5	n=22
Promoted	56%	39%	62%	41%	60%	50%	57%	20%	68%
Left Track as Assistant Professor	39%	44%	37%	44%	38%	50%	43%	40%	32%
Still Assistant Professor	5%	17%	1%	15%	1%	0%	0%	40%	0%

Regression Model Predicting Promoted vs. All Others

In an effort to identify a source for the gender difference we observed in the data overall and in the two largest schools, we attempted to assess whether potentially relevant variables that we had access to were related to tenure outcome crudely defined as promoted vs. all other outcomes (left, denied, etc.) across the two cohorts. Since this was a dichotomous outcome, we used logistic regression.

The regression model for the campus as a whole, and in both cohorts, included the following variables for all 1071 cases.

- Gender
- Race (defined either as Asian/Asian American and Underrepresented Minority OR as White/non-White)
- Budgeted joint appointment
- School (LSA, Engineering, Medicine)
- Cohort

Following are results (coefficients and standard errors) for the regression model for these variables (using the two race/ethnicity variables, underrepresented minority and Asian/Asian American). In this model, Gender (male), LSA and Engineering were associated significantly with promotion. No other variables showed effects. That is, the probability of being promoted was significantly higher for faculty who were male, or in LSA or Engineering. However, this analysis combines in the "not promoted" group people who were denied tenure, those who left before being reviewed, and those who were still assistant professors; and it combines the two hiring cohorts.

All Faculty promoted vs. all others (N=1071)		
	coefficient	standard error
Gender	-.324 *	.134
Asian/Asian American	-.167	.173
Underrepresented Minority	-.140	.188
Budgeted Joint Appointment	.152	.383
Engineering	.857 *	.267
LSA	.459 *	.267
Medicine	.115	.159
Cohort	.108	.126

*p<.05

Factors Associated with Promoted vs. Denied Tenure

We further examined the source of the observed differences, for those individuals who actually came up for tenure, between those who were promoted and those who were denied. These analyses focused on a much more precise outcome, but it does ignore those people who left before being reviewed for any reason.

To do this analysis we acquired additional information from the three largest schools about actual tenure denials. And we collected additional information from the schools about factors that seemed potentially relevant to the tenure decision. These included:

- Candidate took modified duties during the probationary period
- Candidate had an extension of the tenure clock
- N of grants as PI (for those in fields where this is relevant)
- % of women on college executive committee when reviewed
- % of underrepresented minorities on college executive committee when reviewed
- % of women up for tenure in candidate's college when reviewed
- % of underrepresented minorities up for tenure in candidate's college when reviewed

Because few people in the early cohort were granted modified duties and extensions of the tenure clock, analyses were limited to the second cohort of assistant professors in Engineering, LSA, and Medicine.

Moreover, initial analyses revealed substantial relationships among the potential predictor variables, making a regression analysis inappropriate. Instead we provide the bivariate correlations of each of the variables considered with the outcome variables (promoted vs. denied tenure). Table 3 displays the correlation coefficients.

Table 3: Correlations with Promoted vs Denied Tenure Cohort 2

Gender (264)	-0.157 **		% Women Ex Comm (264)	-0.087
URM (264)	-0.158 *		% URM Ex Comm (264)	-0.185 ***
Asian/Asian American (264)	0.018		%Women Reviewed (264)	-0.241 ***
Joint Appt (264)	-0.118 t		% URM Reviewed (264)	-0.210 ***
Modified Duties (264)	-0.036		Engineering (264)	0.107
Yrs Off Clock (259)	-0.219 ***		LSA (264)	-0.280 ***
N Grants PI (192)	0.237 ***		Medicine (264)	0.218 ***

Note : Ns are noted within parentheses.
tp<.10; *p<.05; **p<.01; ***p<.001.

These analyses reveal several negative correlations suggesting that women, underrepresented minorities, and those who received years off the clock were significantly less likely to be awarded tenure; in contrast, serving as PI on more grants was associated with receiving tenure. There was a non-significant trend for having or a joint appointment to be associated with promotion denial as well. It is important to note that being female and an underrepresented minority are both associated with having a joint appointment (r=.147, p<.001 for women; r=.190, p<.000 for URMs).

The data also suggest that features of the tenure review process itself may have implications for tenure outcomes. Specifically, having a higher proportion of women and underrepresented minorities in the pool of candidates reviewed for tenure, and having a higher proportion of underrepresented minorities serving on college executive committees were associated with negatives outcomes. Finally, those faculty under review in LSA were less likely to be promoted than faculty in the other two schools, while those in Medicine were more likely to be promoted.

Longer Term Retention Outcomes for Cohort 1

The previous analyses assessed outcomes for faculty in each cohort 7 years after the "youngest" assistant professor was hired at UM. For cohort 1 we also examined later outcomes, specifically to AY2008, to assess longer term retention of these faculty members. The data are provided below for the entire campus (see Table 4).

Table 4: Campus-wide - Retention Outcomes for Hiring Cohort 1 (AY1993-AY1997) as of 2008

	Total			White		URM		Asian	
	All	Female	Male	Female	Male	Female	Male	Female	Male
	n=518	n=179	n=339	n=122	n=260	n=35	n=31	n=22	n=48
Promoted, here as of 2008	44%	46%	44%	49%	44%	37%	39%	41%	44%
Promoted, left track as of 2008	13%	9%	15%	8%	15%	14%	19%	9%	15%
Left Track as Assistant Professor	42%	45%	41%	43%	41%	49%	42%	50%	42%

By AY2008 13% of the cohort left UM after receiving tenure; in addition all of those faculty still at the assistant professor level in AY2003 had left the University. A larger percentage of male faculty (including white, underrepresented and Asian/Asian American males) left UM as associate professors than their female counterparts.

We also examined these data separately for the three large schools (Engineering, LSA, and Medicine). The results for the College of Engineering (Table 5a) were similar to those for the campus-wide data. A total of 13% of the faculty in this cohort left UM after receiving tenure by AY2008. Further, only male associate professors left UM by AY2008. The small number of women who had been promoted were still at UM as of this academic year.

Table 5a: College of Engineering - Retention Outcomes for Hiring Cohort 1 (AY1993-AY1997) as of 2008

	Total			White		URM		Asian	
	All	Female	Male	Female	Male	Female	Male	Female	Male
	n=40	n=10	n=30	n=7	n=17	n=1	n=2	n=2	n=11
Promoted, here as of 2008	53%	50%	53%	57%	59%	0%	0%	50%	55%
Promoted, left track as of 2008	13%	0%	17%	0%	12%	0%	50%	0%	18%
Left Track as Assistant Professor	35%	50%	30%	43%	29%	100%	50%	50%	27%

Data for LSA (Table 5b) were again similar to those for the campus-wide data; 15% of the faculty in the cohort left UM after receiving tenure. As with the total sample, a larger percentage of those who left were male faculty with one exception: more underrepresented minority female associate professors left UM by AY2008 than their male counterparts, or than White or Asian/Asian American women.

Table 5b: College of LSA (All Divisions) - Retention Outcomes for Hiring Cohort 1 (AY1993-AY1997) as of 2008

	Total			White		URM		Asian	
	All	Female	Male	Female	Male	Female	Male	Female	Male
	n=131	n=48	n=83	n=34	n=61	n=8	n=10	n=6	n=12
Promoted, here as of 2008	44%	46%	43%	53%	46%	25%	40%	33%	33%
Promoted, left track as of 2008	15%	13%	17%	6%	16%	38%	10%	17%	25%
Left Track as Assistant Professor	40%	42%	40%	41%	38%	38%	50%	50%	42%

In the case of Medical School data (Table 5c) 10% of the cohort left UM as associate professors as of AY2008. The percentages of those who were promoted and then left UM were fairly comparable between all male (11%) and female (10%) faculty and also between white male (11%) and white female (13%) faculty. No underrepresented minority faculty and no female Asian/Asian American faculty in this cohort left after receiving tenure.

Table 5c: Medical School – Retention Outcomes for Hiring Cohort 1 (AY1993-AY1997) as of 2008

	Total			White		URM		Asian	
	All	Female	Male	Female	Male	Female	Male	Female	Male
	n=201	n=50	n=151	n=38	n=129	n=7	n=7	n=5	n=15
Promoted, here as of 2008	49%	60%	45%	55%	45%	71%	57%	80%	40%
Promoted, left track as of 2008	10%	10%	11%	13%	11%	0%	0%	0%	13%
Left Track as Assistant Professor	41%	30%	44%	32%	44%	29%	43%	20%	47%