

Gender Equity By The Numbers: Status of Women in Biological & Physical Sciences at the University of Wisconsin-Madison, 2002-2006

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Introduction and History

In 2002, the Women in Science & Engineering Leadership Institute (WISELI) became one of the first nine sites to receive an ADVANCE Institutional Transformation (ADVANCE: IT) award from the National Science Foundation (NSF). Any site that receives an ADVANCE: IT award is required to submit certain data to NSF annually regarding gender equity. As outlined in the cooperative agreement received by each site:

“Awardee will maintain a uniform database of quantitative indicators of activity and progress. NSF will provide general guidelines for the collection of data in order to provide coordination across ADVANCE Institutional Transformation projects and to establish the basis for evaluation of the ADVANCE program.”
(University of Wisconsin-Madison/NSF Cooperative Agreement, page 4.)

The “general guidelines” for the collection of the data were created at the first annual ADVANCE Principle Investigator (PI) meetings at NSF in April of 2002. At that meeting, at least one PI from each of the first nine ADVANCE: IT sites attended, and as a group created a list of important quantitative indicators of gender equity, including:

- Number and percentage of women faculty in science and engineering (S&E), by department
- Number of women in tenure-line positions, by rank, department, ethnicity
- Tenure promotion outcomes
- Years in rank by gender
- Time at institution and attrition
- Numbers of women in non-tenure-track positions (both teaching and research)
- Number and percentage of women S&E in administrative positions
- Number of women S&E in endowed/named chairs
- Number and percentage of women S&E on promotion and tenure committees
- Salary of S&E (by department, rank, years in rank)
- Space allocation (by gender, other controls)
- Start-up packages (include different components of package, include controls)

After this initial list was generated, each site was asked to rate each item in the list by whether (1) they could collect the data easily, (2) it would not be easy to collect, but they would like to do it, and (3) it would be impossible to collect the data. A table was created summarizing the distribution of the 9 sites for each of these 12 indicators, and the “NSF 12” group of gender equity measures was created. In Appendix 1 of this report, we reproduce a summary of this

meeting that appears in the NSF ADVANCE “Toolkit 1¹”, as well as the two documents generated at the April 2002 ADVANCE PI meeting.

In addition to generating the gender equity indicators each ADVANCE site was to collect, we discussed a number of important considerations for the reporting of the data. First, we decided to establish a “baseline” of data against which to evaluate the results of the ADVANCE: IT project by agreeing to collect the data as of 2000 or 2000/01 academic year. Second, we decided that except for the indicator tracking non-tenure-track scientists and engineers, we would concentrate our data collection on tenured and tenure-track faculty only. Third, we agreed that collection could be restricted to only science and engineering faculty (that is, data from arts and humanities departments do not need to be collected), but that social sciences *must* be included in the definition of “science and engineering”, even if the ADVANCE: IT site is not focusing on the social sciences. Finally, some categories of gender equity indicators (climate, productivity, family/work-friendly policies, non-institutional indicators) were acknowledged to be important, but were not “required” for collection or delineated further.

At the University of Wisconsin-Madison, PIs Jo Handelsman and Molly Carnes, and Research Director Jennifer Sheridan, took this mandate from the NSF to what was then the Office of Budget, Planning & Analysis (OBPA), led by Dr. Martha Casey. In the original grant proposal, the Provost agreed that OBPA would donate time for collection of data in the form of “cost share” towards the grant. Dr. Casey assigned Margaret Harrigan, Senior Policy Analyst, to work with Jennifer Sheridan on the collection and reporting of the required data. Together, they worked on issues of how to report each indicator within the constraints imposed by the human resources and salary databases maintained by the University. Some of the issues discussed included:

1. Whether to report by headcounts, or FTE
2. What departments should be included under particular disciplinary groupings
3. How to report tenure and promotion outcomes
4. Which indicators the OBPA could not assist with

The most difficult decision was how to group departments by division. In the original proposal, Drs. Handelsman and Carnes proposed to only work with “biological and physical science” faculty. It is somewhat easy to determine whether a faculty member is in the biological or physical sciences based on his or her individual divisional committee membership, but the NSF required data reporting at the *departmental* level. Therefore, we needed to assign entire departments to a divisional affiliation, and this is not always easy to do as some departments might include faculty from more than one division (e.g., biochemistry includes faculty from both the biological sciences (BS) and physical sciences (PS) divisions; we assigned this department to the biological sciences because more faculty are BS than in PS.) In the end, we prepared a list that is reproduced in Appendix 2. When departments housed faculty in more than one division, the entire department was assigned the division to which the majority of faculty members belonged.

¹ Frehill, Lisa; Cecily Jeser-Cannavale; Priscilla Kehoe; Ellen Meader; Jennifer Sheridan; Abby Stewart; and Helena Sviglin. 2005. “Toolkit for Reporting Progress Toward NSF ADVANCE: Institutional Transformation Goals.” http://www.nmsu.edu/%7Eadvprog/Final%20toolkit_1_-_indicators%5B1%5D.pdf.

Because some data are not included in databases OBPA traditionally uses to produce their reports, the indicators that OBPA would not be providing WISELI include:

- Tenure promotion outcomes by gender (tenure awarded or denied)
- Number of women in endowed/named chairs
- Number and percentage of women S&E faculty on promotion and tenure committees
- Space allocation for S&E faculty
- Startup packages for S&E faculty

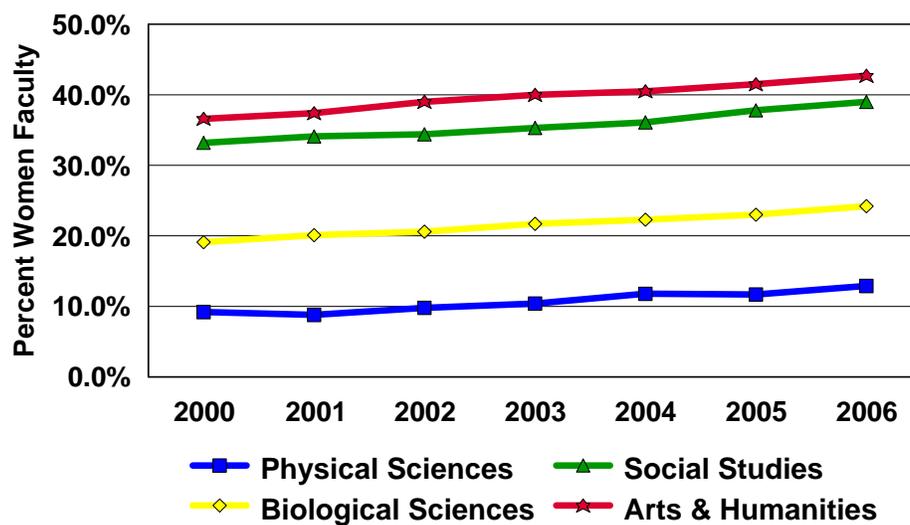
Finally, one major indicator was missing from the “NSF 12” list created in April 2002. Numbers and percentages of women newly hired each year was not included in this list. This indicator was added to the list during the creation of “Toolkit 1.” These data are also collected by OBPA and provided to WISELI.

In the report that follows, the “NSF 12” (now 13 with the addition of hiring data) are grouped based on the major research questions they can answer, in a format developed by Lisa Frehill and outlined in “Toolkit 1.” We use the indicator data we have collected from 2000-2006 to provide analysis of the four questions or their sub-questions, and end each section with a summary of findings including recommendations for further study if appropriate, and we also end with a recommendation regarding further collection of the indicator (which could include keeping the collection as-is, altering the parameters of the reporting in some way, or eliminating the indicator in the future.) We focus on the status of women in the biological science (BS) and physical science (PS) departments in this report. Where comparisons with social studies (SS) and/or arts & humanities (AH) departments are illustrative, we include them as well.

Distribution of biological and physical faculty and staff by gender, rank and department

Percentages of Women Faculty in STEM. The great news is that percentages of women faculty in biological (BS) and physical (PS) sciences at UW-Madison have generally been increasing since 2000, as has the proportion of women in all divisions.

Figure 1. Percent Women Faculty, by Division



Since 2000, the annual rate of increase has been faster in the BS and PS divisions, compared to the social studies (SS) or arts & humanities (AH) divisions. The PS division was 9.2% women in 2000, and 12.9% female in 2006—an average growth of 5.6% per year. Similarly, the BS division was 19.1% female in 2000 and 24.2% in 2006, which is an increase of 3.9% per year. The corresponding numbers for SS and AH divisions are 2.7% and 2.6% per year, respectively.

The increases in percentages are driven primarily by an increase in women, but a decrease in men is also helping to increase the percentages of women on the faculty. In the PS division, for example, the FTE count of women faculty increased by 5.7% each year (from 42.25 in 2000, to 59.5 in 2006) while the FTE count of men faculty in the PS division decreased slightly, by 0.6% each year. Similar trends appeared for all divisions.

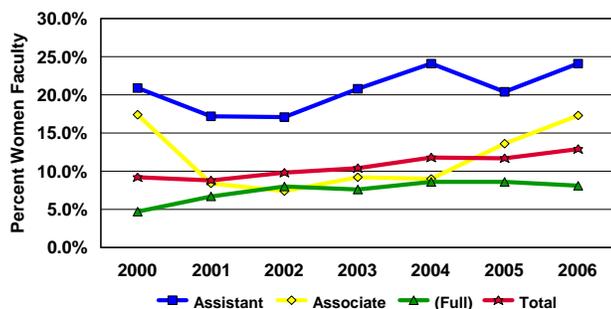
Table 1. Increases in Percent Women Faculty, 2000 - 2006

Division	2000			2006			Percentage Change/Year, 2000 - 2006		
	Women FTE	Men FTE	% Women	Women FTE	Men FTE	% Women	Women FTE	Men FTE	% Women
Physical Sciences	42.25	414.79	9.2%	59.50	400.80	12.9%	5.7%	-0.6%	5.6%
Biological Sciences	139.26	590.54	19.1%	185.31	580.79	24.2%	4.8%	-0.3%	3.9%
TOTAL SCIENCE	181.51	1005.33	15.3%	244.81	981.59	20.0%	5.0%	-0.4%	4.5%
Social Studies	194.61	391.31	33.2%	230.20	360.23	39.0%	2.8%	-1.4%	2.7%
Arts & Humanities	136.47	235.99	36.6%	158.25	212.23	42.7%	2.5%	-1.8%	2.6%
TOTAL NON-SCIENCE	331.08	627.30	34.5%	388.45	572.46	40.4%	2.7%	-1.5%	2.6%

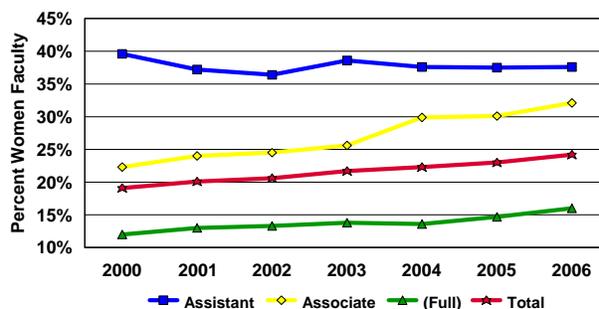
Examining trends by rank, we can see some areas of positive change for women in PS and BS departments, but also an area of concern. For assistant professors in PS departments, the trend

has generally been an overall increase in the percentage of women assistant professors. In BS departments this trend has been flat or even slightly decreasing. This decline in BS departments is especially problematic considering that the pool of potential women faculty is so much larger in the BS departments. For both PS and BS departments, the percentage of women among our associate ranks has been increasing during the past several years. This is very encouraging, as it indicates that women are getting tenure at strong rates once they are hired, or it indicates that we are hiring more women with tenure. Finally, although it is slow, the percentage of full professors who are women has been rising over time. It is most difficult to show increases in the percentages of women among full professors because this is the terminal rank; faculty can spend thirty or more years in this rank, while there is much more turnover in the lower ranks. Overall, we are encouraged by the rising proportion of women at all ranks except at the assistant professor rank for women in the BS departments.

**Figure 2a. Percent Women Faculty, by Rank
Physical Science Departments**



**Figure 2b. Percent Women Faculty, by Rank
Biological Science Departments**



Findings: The percentage of women on the UW-Madison faculty has been increasing in all divisions. This increase is primarily due to adding more women to the faculty, although the declining numbers of men are also contributing to the overall trends. The percentage of women assistant professors in BS departments has been declining slightly over this period for unknown reasons; this trend requires further investigation and explanation.

Recommendations: Continue to collect these data by gender, rank, and department. Although we usually summarize these data at the divisional level, having departmental-level data is important so that percentages can be calculated for schools/colleges, or other groupings of departments as required. FTE counts are an appropriate way to collect the data at the department level in order to account for faculty with multiple appointments; however, a new table that shows headcounts of faculty by rank and individually-declared divisions would be a welcome addition. It is imperative that data are at least disaggregated by division, as the much higher numbers of women in SS and AH divisions could mask changes (either positive or negative) occurring in PS and BS divisions. Parallel data should be collected for racial/ethnic minority groups.

Percentages of Women Academic Staff in STEM. It is thought that many women who earn PhDs in STEM (Science, Technology, Engineering and Mathematics) fields are “stuck” in less-prestigious, less-visible jobs on the non-tenure-track faculties and staffs of many universities. These women may be lecturing, working in research labs, advising students, or other such

positions. NSF required the collection of data on these non-tenure-track academic workers in order to monitor whether the University is tending to differentially steer women towards these jobs rather than the academic leadership position conferred by a job on the ladder faculty.

WISELI worked with the OBPA to more clearly define what “# of women in S&E who are in non-tenure-track positions (teaching and research)” means at UW-Madison. Non-tenure-track positions at UW-Madison are known as “academic staff.” The difficulty arises when we must decide which academic staff are in science and engineering, which staff are teaching, and which staff are conducting research. We decided to track six title series (all ranks) that we believed had the highest probability of containing academic staff with PhDs or equivalent degrees—the academic staff who *could* have been faculty had they pursued a tenure-track position. We selected two title series to define the teaching staff (Lecturer and Faculty Associate); two title series to define the research staff (Researcher and Scientist); and two title series to define a third category of staff who could have been faculty—the clinical staff (Clinical Professor and Professor (CHS)). To designate whether an academic staff member in one of these title series is in a BS or PS (or some other division), we assigned divisions based on the department of their appointment(s). As with the faculty counts above, we used FTE rather than headcounts to account for staff in more than one department, and also to look at differences in appointment percentages that may arise between women and men academic staff.

Figure 3a. Percent Female Academic Staff Physical Science Departments

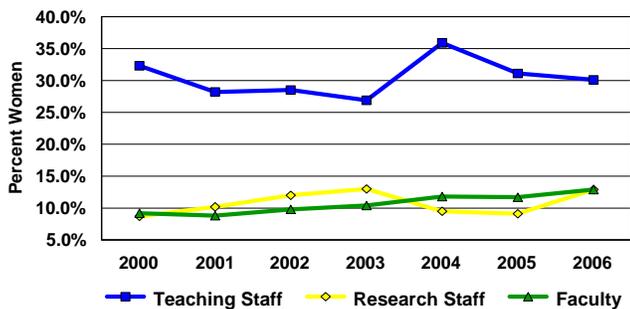
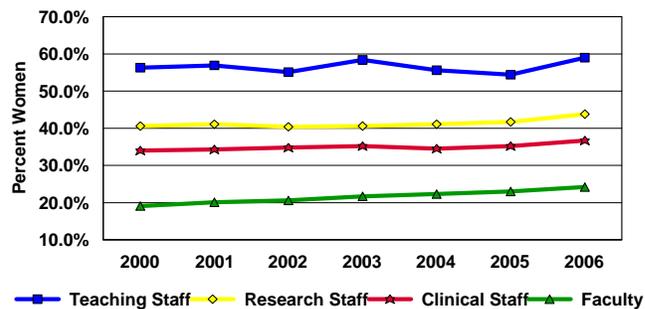


Figure 3b. Percent Female Academic Staff Biological Science Departments



Women at UW-Madison are over-represented in the teaching positions, relative to their presence in the research and/or clinical positions. The percentage of women in research positions in the PS departments is very similar to their presence in the faculty, while women are much more strongly represented in the teaching positions. Women are also more highly represented in teaching positions in the BS departments, compared to their presence in the research or clinical tracks. Women’s participation in any of these non-ladder tracks is much higher than their participation in the tenure-track faculty in BS departments.

Although tracking these trend is interesting, it is less clear what we should do with this information. What would it mean if the percentage of women in the academic staff teaching positions in the BS or PS departments were to decrease over time? What if women were increasingly being hired into the tenure-track faculty positions and this is why their percentage in the teaching staff decreases, or alternatively, what if the percentage of women overall increases so that their percentages in all tracks—research, teaching, clinical and faculty—increase as well

over time. While these data are illustrative of the tendency for women to be more strongly represented in non-tenure-track positions, tracking the trends over time does not appear to provide useful information for institutional change.

Findings: Women are over-represented in the teaching tracks for PS and BS departments relative to their presence on the faculty. In the BS departments, all non-tenure-track positions have a higher proportion of women than their faculty counterparts, while in the PS departments women's presence on the research track mirrors their presence on the faculty.

Recommendations: There is no need to track these data from year-to-year. Spot checks every 3-5 years to uncover the gendered appointments of tenure-track and non-tenure-track scientists and engineers will accomplish the same goals. Spot checks would also be useful to gauge whether under-represented minorities are being hired more often in non-tenure track positions.

Outcomes of institutional processes of recruitment and advancement for men and women faculty in the biological and physical sciences

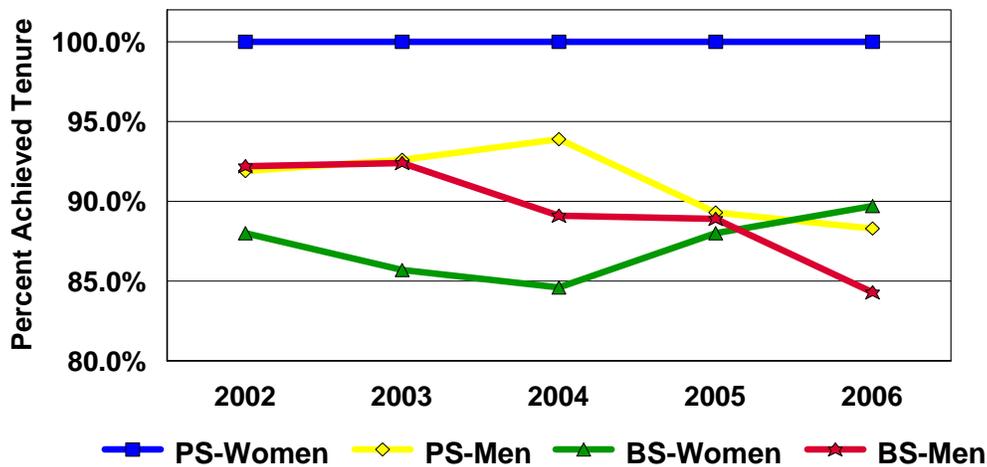
Tenure Promotion Outcomes. Hiring women faculty is important, but it is also important to retain them. The women assistant professors we bring into the UW-Madison must be mentored, encouraged, and given the resources and support they need to succeed in their quest for tenure. If we do not tenure the women we hire, we cannot transform the leadership in academic science and engineering at UW-Madison. At UW-Madison, the usual path is for an incoming assistant professor to be given six years to compile a portfolio of teaching, research and service. Each assistant professor is assigned a mentoring committee, and yearly progress towards tenure goals is noted. If an event that might delay productivity, such as having/adopting a child, occurs during these six years, the faculty member can be granted a tenure clock extension—increasing the number of years s/he has to accomplish the qualifications of a tenured faculty member. When the faculty member is ready, they prepare a dossier of their accomplishments and letters from outside reviewers are requested, to ascertain the junior faculty's visibility in the field nationally (or internationally.) The packet and letters are reviewed by the department's executive committee, and voted upon. If the department votes to award tenure to the assistant professor, then the chair writes a letter indicating the department's support of the person and the entire packet is forwarded to one of four divisional committees (PS, BS, SS, and AH). The divisional committee ultimately votes to award or deny tenure based on an independent review of the tenure packet and accompanying letters. Divisional committees have been known to decline to tenure, even in cases where the department submitted a positive vote.

Thus, measurement of tenure outcomes at UW-Madison is best done in two different ways. First, it is important to know the raw percentages of women and men who submit dossiers to the divisional committee for tenure and receive it, so "tenure rates" at the divisional level should be reported. However, many junior faculty do not even make it far enough in the process to submit their materials to the divisional committees. They may be encouraged to leave before they even submit their materials to their departments, or they may submit their materials at the department level but the department may vote not to forward their tenure packet to the divisional committee. To ascertain whether there is gender equity in the dossiers submitted to the divisional committee (that is, whether women are disproportionately forced out before they even get to the divisional

committee review), a cohort/longitudinal approach is required. We have been using both methods of measurement at UW-Madison from 2000 to 2006, although we changed our procedures for the cohort analysis in 2004.

Regarding the raw percentages of women vs. men who are awarded tenure, given that they have submitted their materials to the appropriate divisional committee, we find little gender difference in the tenure rates. We measure “tenure rates” as a rolling 5-year rate, summing the numbers reviewed and numbers awarded over a five year period, and each year we remove the oldest year while adding the newest. This method decreases the large year-to-year fluctuations in rates due to low numbers, especially for the women’s rates. We found that women in the PS division have achieved tenure 100% of the time that they have been recommended by their departments, in contrast to their male peers who are denied tenure about 10% of the time. Women in the BS division have been achieving tenure at slightly lower rates than their male colleagues; however, in recent years this trend has shifted and women are increasing their chances of achieving tenure, while their male counterparts have declining tenure rates in 2005 and 2006.

**Figure 4. Tenure Rates, by Gender and Division
Physical & Biological Science Faculty Only**



As noted above, these rates do not take account of the junior faculty who never make it to the divisional committees; faculty who are either encouraged to leave before submitting their materials to their departments (e.g., after their third-year review), or who receive a negative vote at the department level and are never evaluated by the divisional committee. To measure whether men and women faculty are differentially leaving pre-tenure, we use a cohort approach. From 2000 to 2003, we used the approach OBPA uses in their annual reports to the Committee on Women and the Data Digest. Five-year incoming cohorts of faculty are followed and tenure rates within six years, and nine years, are calculated. Using this method, we saw some dramatic differences in tenure rates for men and women faculty in PS and BS departments for faculty hired between 1991 and 1996.

Table 2. Tenure Promotion Outcomes by Gender, 2003

Physical Sciences										
Entering Cohort*	Women					Men				
	Total Hired	Within 6 Years		Within 9 Years		Total Hired	Within 6 Years		Within 9 Years	
		Count	Percent	Count	Percent		Count	Percent	Count	Percent
1987-91	17	12	70.6	15	88.2	87	55	63.2	66	75.9
1991-95	7	3	42.9	3	42.9	36	22	61.1	29	80.6
1992-96	7	2	28.6	3	42.9	32	21	65.6	27	84.4

Biological Sciences										
Entering Cohort	Women					Men				
	Total Hired	Within 6 Years		Within 9 Years		Total Hired	Within 6 Years		Within 9 Years	
		Count	Percent	Count	Percent		Count	Percent	Count	Percent
1987-91	29	8	27.6	16	55.2	101	57	56.4	70	69.3
1991-95	27	11	40.7	19	70.4	81	48	59.3	61	75.3
1992-96	28	12	42.9	20	71.4	78	46	59.0	57	73.1

The problem with this approach is that a cohort does not appear on the table until at least six years after they enter the University, at which time it is too late to stop any trends in attrition that are manifesting. Also, from the table it is hard to know who has not achieved tenure in six years because they left the University, or because they received a tenure extension. Thus, we changed the cohort reporting in 2004 so that trends in tenure promotion outcomes would become apparent sooner in a cohort's career and might permit implementation of interventions.

Table 3. Tenure Promotion Outcomes by Gender, 2006

Physical Sciences								
Entering Cohort	Women				Men			
	Total Hired	% Still	% Left w/o	%	Total Hired	% Still	% Left w/o	%
		Probation	Tenure	Tenured		Probation	Tenure	Tenured
1987-91	16	0.0%	12.5%	87.5%	87	0.0%	24.1%	75.9%
1991-95	7	0.0%	57.1%	42.9%	35	0.0%	20.0%	80.0%
1995-99	10	0.0%	40.0%	60.0%	34	0.0%	11.8%	88.2%
1999-03	15	46.7%	13.3%	40.0%	76	34.2%	13.2%	52.6%
2003-07	20	100.0%	0.0%	0.0%	57	94.7%	1.8%	3.5%

Biological Sciences								
Entering Cohort	Women				Men			
	Total Hired	% Still	% Left w/o	%	Total Hired	% Still	% Left w/o	%
		Probation	Tenure	Tenured		Probation	Tenure	Tenured
1987-91	27	0.0%	40.7%	59.3%	103	0.0%	32.0%	68.0%
1991-95	26	0.0%	26.9%	73.1%	82	0.0%	24.4%	75.6%
1995-99	23	4.3%	21.7%	73.9%	49	2.0%	26.5%	71.4%
1999-03	46	45.7%	17.4%	37.0%	86	40.7%	20.9%	38.4%
2003-07	30	96.7%	3.3%	0.0%	57	94.7%	3.5%	1.8%

NOTE: Numbers in **BOLDFACE** are final; numbers in normal typeface are in flux and will change year-to-year as new faculty are hired, are tenured, and/or leave the UW without tenure.

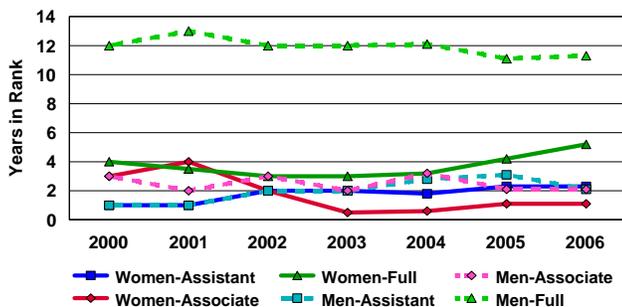
Using this new format, we can observe from year-to-year how the cohorts of junior faculty are faring. The cohort that began their employment at UW-Madison in 1995-99, which would have been coming up for tenure during the time that WISELI was operating, was equitable for men and women assistant professors in the BS departments, but not in the PS departments. A much higher percentage of women in PS departments (40.0%) left without tenure from the 1995-99 cohort, compared to their male peers (11.8%). Fortunately, this trend seems to have stopped for the more recent cohorts in both PS and BS departments. In the PS departments, women and men tend to be leaving without tenure at approximately the same rates. Men are getting tenure a bit faster than women (52.6% of the men in that cohort have tenure in 2006, compared to 40.0% of the women in that cohort), but this is to be expected because women are more likely to use tenure clock extensions. Similarly, in the BS departments, the percentages of women who are leaving without tenure in the current cohorts is approximately similar to those of men, and interestingly their tenure rates are about the same as well.

Findings: Large gender differences in tenure outcomes for women as measured using the cohort approach were evident in the 1987-1999 cohorts in PS departments. Smaller but still noticeable gender differences occurred in BS departments for the 1987-1995 cohorts. The most recent cohorts of junior faculty do not appear to be either achieving tenure or leaving the UW prior to tenure at rates that differ by gender. Once a tenure case is submitted to the divisional committee, there do not appear to be differential tenure outcomes by gender for any cohort.

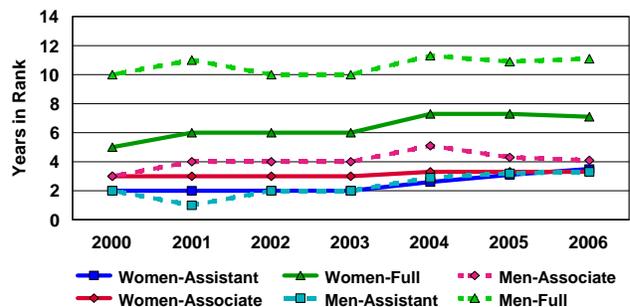
Recommendations: Continue to collect both the divisional committee data, and the cohort data as defined beginning in the 2004 indicators, to ensure that men and women are achieving tenure at equitable rates. Begin collecting these data by racial/ethnic group membership as well.

Median years in rank and time at institution. The ADVANCE: IT PIs decided to include these measures in the list of gender equity indicators in order to assess gender differences especially at the associate rank. In many universities, the time a faculty member spends at the associate rank is long and indefinite, and anecdotally many women get “stuck” in this rank. On the other hand, time at institution is correlated with many institutional rewards such as leadership opportunities, salary, access to resources, etc.

**Figure 5a. Median Time in Rank, by Gender
Physical Science Departments**



**Figure 5b. Median Time in Rank, by Gender
Biological Science Departments**



Clearly, male full professors in BS and PS departments have the most years in rank. Women full professors in BS departments are catching up, however; the gap is only four years in 2006, while

it was five years in 2000 (and the gap is 6.1 years for full professors in PS). Among associate and assistant professors, however, very little difference between men and women is observed. There may actually have been a tendency for men in BS departments to remain in the associate rank longer than women (the opposite problem than the original reason the measure was proposed); however, the median years in the associate rank has reached gender parity by 2006.

Time at the UW-Madison shows even less interesting patterns. Men and women in PS and BS departments in the assistant and associate ranks tend to have the same median years at UW-Madison. Only when you get to the full professor level do you see large gaps between the median years at UW-Madison for men and women, and these gaps are closing over time, as more women move through the system and more men who have been at UW-Madison for many years retire.

Figure 6a. Median Time at UW-Madison Physical Science Departments

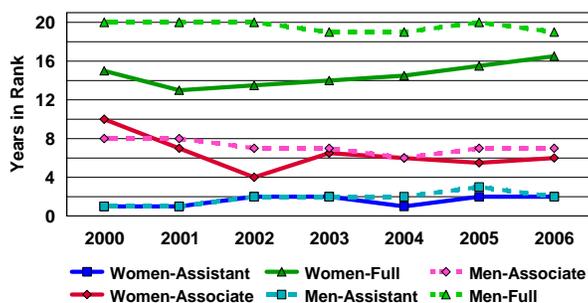
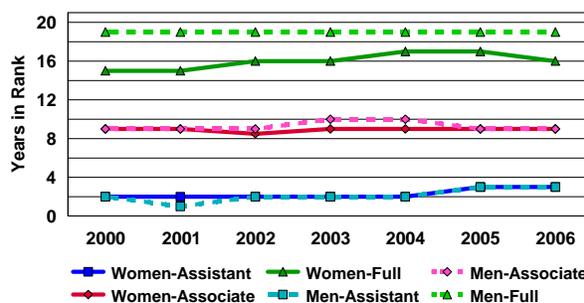


Figure 6b. Median Time at UW-Madison Biological Science Departments



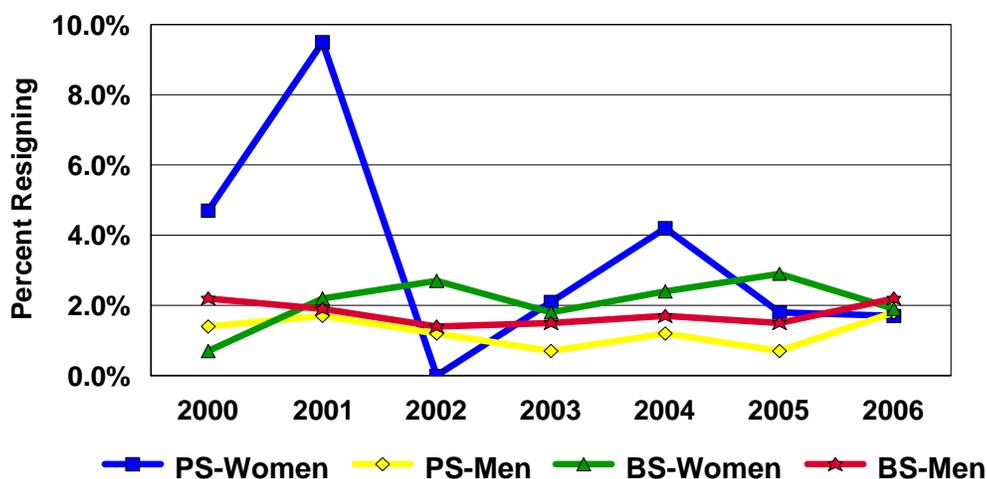
Findings: No real differences in either time in rank, or time at UW-Madison, for assistant and associate professors. Large gender differences in time in rank and time at UW-Madison appear for full professors, but this is not unexpected and is closing over time. UW-Madison does not appear to have a problem with women staying in the associate ranks for much longer periods of time compared to their male peers (in fact, the opposite may be the case, particularly in the BS departments.)

Recommendations: Do not track these variables on an annual basis.

Attrition. We clearly want to know if women faculty are leaving the University at greater rates than are men, but it is important to distinguish between retirements, and attrition for other reasons. Unfortunately, we cannot know if a faculty member who officially “retires” from the UW-Madison is actually retiring and then taking another position elsewhere and continuing along his/her career. That happens often, as many faculty have enough years of service to “retire” and begin collecting his/her state pension, even while they are gainfully employed elsewhere.

Nevertheless, to the extent possible we do distinguish between those who have left the UW-Madison to retire, and others. We used age (55) as a cutoff—if a faculty member left the UW-Madison at age 55 or older we assumed a retirement, and if the faculty member was younger than 55 we assumed it was real attrition. We recognize this is an imperfect measure.

**Figure 7. Percent Resigning from UW-Madison
Physical & Biological Science Faculty Only**



At UW-Madison, we clearly have some issues of differential attrition of women and men faculty. PS women have much higher rates of leaving the UW compared to men, even if the data are “smoothed” across all of the years we tracked. Women in BS, too, have higher rates of attrition than their male peers. We used these findings to explore the issues further in our “Why Women Leave” exit interview issue study,² and WISELI will continue to explore this issue for the entire campus as we take over the exit interview process for all faculty at the UW-Madison beginning in Summer 2007.

Findings: Women faculty leave the UW-Madison prior to age 55 at higher rates than their male counterparts, in both the PS and BS divisions.

Recommendations: Continue tracking this indicator, adding information about racial/ethnic differences in attrition, and study the issue further using exit interviews.

Hiring of New Junior and Senior Faculty. One of the first places an ADVANCE: IT site often sees change manifested is in the hiring of women faculty. Tracking the percentage of women among new faculty to the institution is very important because it is the entry-point to the university. If an IT site has a focus on hiring, then it is doubly-important to measure the percentage of women newly hired.

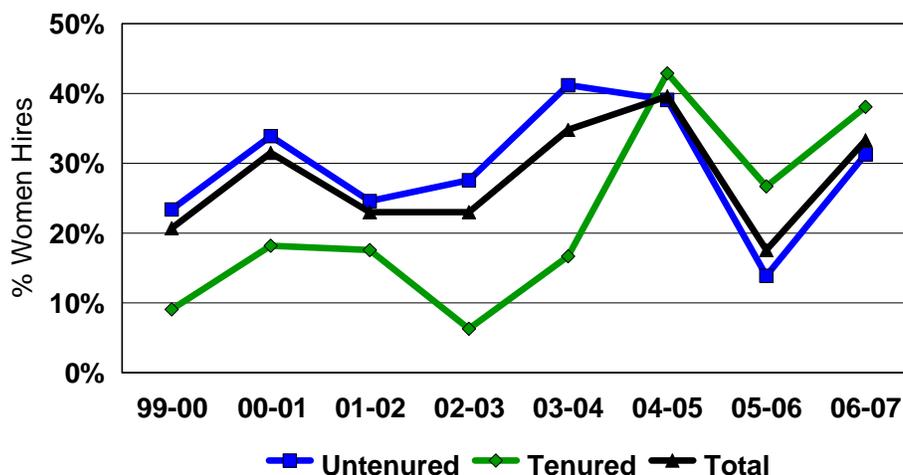
Because this measure was not part of the original “NSF 12”, we began tracking the percentage of women hired using less-reliable data than that provided “officially” through the OBPA. Each year, as a matter of public record, the newly hired faculty are listed by name in the fall of the academic year. We used that list to compile our early hiring statistics. The source of names on this list, the completeness of the list, etc. were unknown, but because it was a constant source of

² O’Connell, Kathleen; Christine Maidl Pribbenow; and Deveny Benting. March 2006. “The Climate at UW-Madison: Begins Sunny and Warm, Ends Chilly.”

data we made the assumptions that any limitations of the data would be repeated from year to year, and thus the *trends* would be accurate, even if the details were not.

Eventually, the Committee on Women in the University saw these hiring trends as useful indicators as well, and asked OBPA to track them by division; therefore, WISELI now has access to “official” OBPA hiring data, which has replaced our old system of tracking.

**Figure 8. Women as Percentage of New Hires
Physical & Biological Science Faculty Only**



The percentage of new hires in PS and BS departments, both tenured and untenured, who are women has increased at UW-Madison since the beginnings of the WISELI project in 2002. A glaring exception is academic year 2005-06, when for some reason the percentage of new hires who were women dropped to very low levels, especially for hiring of untenured faculty. We believe this had to do with the very low actual numbers of positions open that year and the previous year; a small number of positions and the perception that new positions might not be available in the future makes it “riskier” to hire a woman candidate. That one year aside, however, the UW-Madison has been increasing the numbers and percentage of women new hires very well in the past 3-4 years. It is especially wonderful to see that almost 40% of new senior hires are women, an appreciable increase from the years prior to WISELI’s creation. The patterns are remarkably similar in the PS and BS division, and for untenured vs. tenured hires.

Findings: The UW-Madison has shown success in increasing the percentage of new hires in STEM who are female, with the notable exception of one year (2005-06).

Recommendations: Continue to track these data by gender and tenure status at time of hire, and add race/ethnicity measures to this as well to track the hiring of underrepresented minority faculty.

Gender distribution of faculty in leadership positions at UW-Madison

Formal administrative positions. Of course, the “L” in WISELI stands for leadership, and so tracking the presence of women in important leadership positions within the UW-Madison is imperative. The presence of women in administration is a key measure, as it is the faculty (and staff) in those positions who have a great deal of influence over university policy and how it is implemented. These leaders also have a great deal of influence over the climate experienced by faculty. We tracked four different categories of “administrative leaders”: Department chairs, deans (including assistant and associate deans if they also have a faculty position), center directors, and faculty leaders in the central administration (chancellor’s and/or provost’s office.)

Figure 9. % Women in Administrative Positions*
Physical & Biological Science Faculty Only

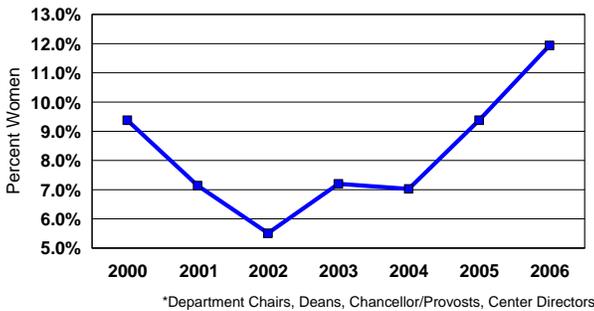


Figure 10. Percent Women Department Chairs
Physical & Biological Science Faculty Only

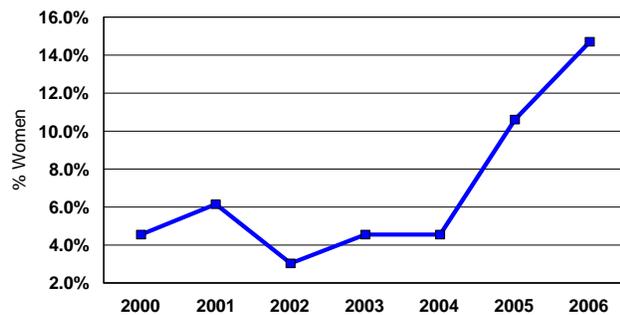
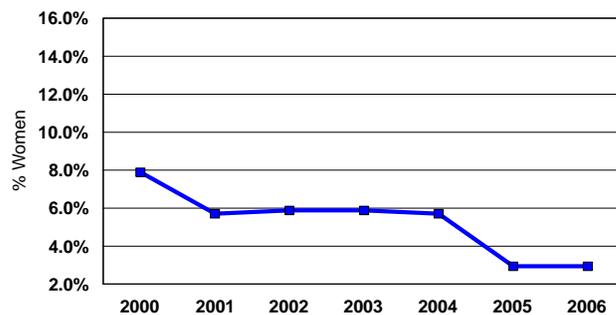


Figure 11. Percent Women Center Directors
Physical & Biological Science Faculty Only



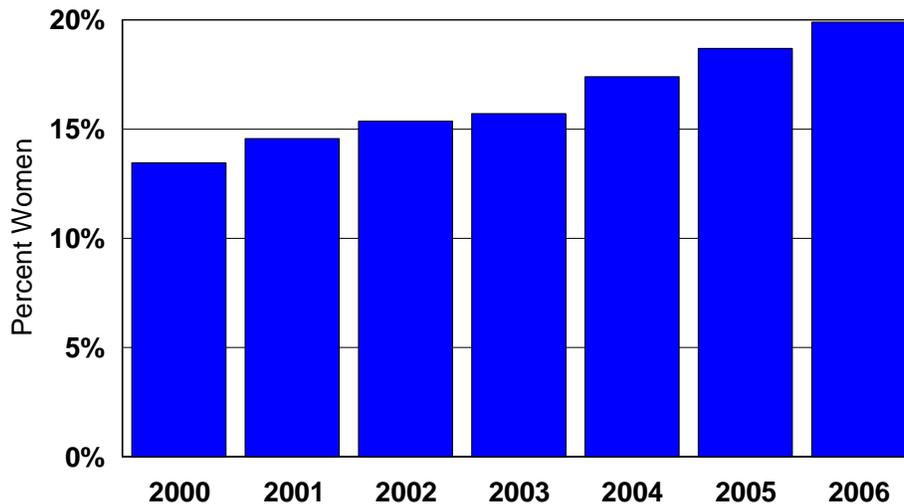
Overall we can see a large increase in the percentage of women PS and BS faculty who are entering formal leadership positions at UW-Madison. The year 2002 seemed to be a low point, with rapid increases after that. Much of the change is driven by the large increase in women department chairs in the approximately 70 departments comprising the physical and biological sciences. In 2002 we had only 2 women department chairs in these departments; by 2006 we had 10. The numbers of deans, and chancellors/provosts who are women does not change appreciably over time, partly because there are so few of these positions available. The other major administrative leadership role, that of center director, has also not yet seen a major change in the numbers of women leaders; in fact the number of women leaders of the approximately 35 largest centers/research institutes on campus has actually been declining, from 3 in 2002 to only 1 in 2006. In the seven years WISELI has been measuring this, there has never been a female director of any of the approximately 20 centers in the physical sciences that we track. This might be an area for future WISELI intervention.

Findings: Over the course of WISELI's tenure, the number of women department chairs in PS and BS departments has increased dramatically, while the number of women in other formal administrative leadership positions has remained stagnant. Future WISELI efforts might focus on women's leadership of centers and institutes.

Recommendations: Continue tracking these leadership positions, and begin tracking the race/ethnicity of our administrative leaders as well.

Endowed professorships. The award of an endowed professorship allows a faculty member considerable freedom to pursue new research that s/he might not otherwise have if forced to compete for grants to perform the same work. In addition, these professorships confer prestige and respect on the recipient, making them a very valuable resource for faculty. Each year, WISELI receives the current list of faculty who hold named professorships from the Office of the Provost, and we track the gender distribution of those awards, looking at the list as a whole, and also looking at groups of awards where numerous faculty are awarded professorships from the same funding source. Because some of the awards are not made by division, we have only looked at the gender distribution of awardees for campus as a whole; we have not attempted to track gender equity by division for this measure.

**Figure 12. Percentage of Endowed Professors Who Are Women
All Divisions**



The percentage of faculty receiving these prestigious awards who are women has risen steadily since 2000, increasing by approximately 6.5% each year, such that the percentage of women holding an endowed professorship in 2006 (19.9%) is almost the same as the percentage of women full professors (22.6%)—the eligible pool of possible recipients. In contrast, women were 17.1% of full professors in 2000, and only 13.5% of endowed professors.

Despite this impressive increase, there are still some inequities in particular professorships, especially the Wisconsin Distinguished Professorships (which have never had a woman recipient), and the Steenbock Professorships. The percentage of women receiving named professorships controlled at the departmental and school levels are also lower than what we

would expect given their proportion of all full professors. Therefore, some attention must be paid to particular professorships and their award processes.

In addition to tracking endowed professorships as required by the “NSF 12”, we also tracked the gender equity of four major campus awards: Vilas Associates, Hilldale Awards, Romnes Faculty Fellowships, and WARF Kellett Mid-Career awards. These four awards are highly visible at UW-Madison; recipients often get a front-page article in *Wisconsin Week*.

Figure 13a. Percentage of Major Prizes Awarded to Women*
All Divisions

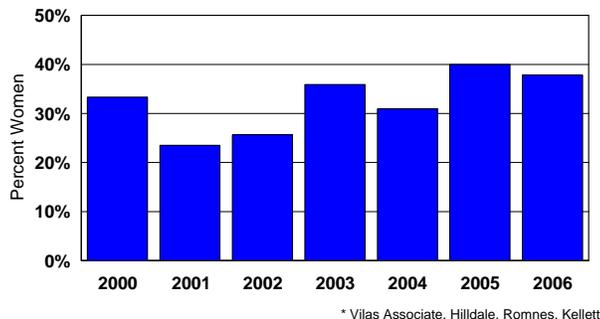
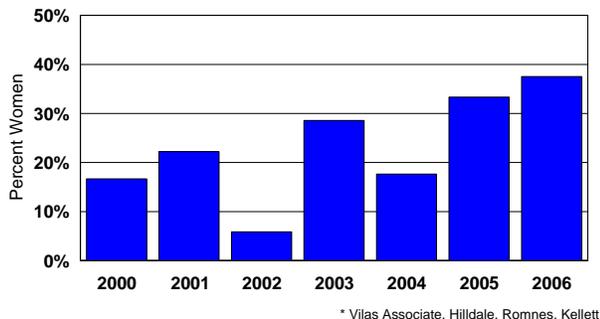


Figure 13b. Percentage of Major Prizes Awarded to Women*
Physical & Biological Science Faculty Only



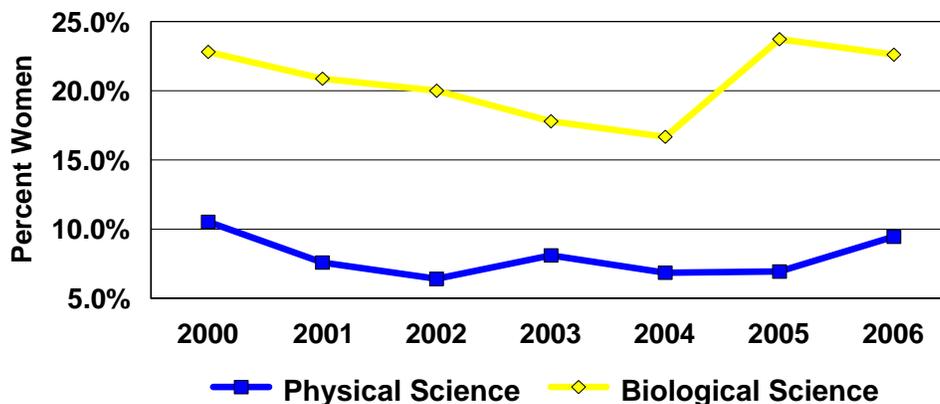
When all divisions of faculty are combined, we see some improvement in the percentages of women receiving these four prestigious campus awards over time. We see a similar improvement when only the PS and BS faculty are tracked. The trend is increasing percentages of women, except that 2004 seemed to be a very bad year for women. In 2005, when some women faculty complained about the lack of awards to women, the Graduate School provided data on ten years of applicant pools and awards of the major campus awards that they control. We found that given their representation on the faculty overall, women in physical sciences are being nominated for and receiving awards in approximately their proportions in the pool. In the biological sciences, however, women are being nominated in proportion to their representation on the faculty, but are not receiving the awards. We suggested that biological science evaluation committees become educated on the impacts of unconscious biases and assumptions on their evaluations; we also recommended training for department chairs to produce recommendation letters and packets that are equitable. The associate deans in the Graduate School promised to act on these findings when working with the committees who make these awards. The report submitted to the Graduate School deans is reproduced in Appendix 3.

Findings: Women at UW-Madison are generally increasing their representation among the recipients of the most prestigious awards on campus, including women in the PS and BS departments. However, there are some specific awards and processes that are in need of attention; educating evaluation committees for these particular awards is recommended.

Recommendations: Continue to track these important campus awards, and begin tracking for race/ethnicity as well. In the future, it might be worthwhile to break down the endowed professorships data by division as well as by gender/race.

Committee memberships. At a university where faculty governance is so strong, tracking participation on key committees is especially important, because much of the university’s selection of leadership, access to resources, evaluation of faculty, and changes/additions to policy occur through these committees. Using the annual list of committee membership published by the Office of the Secretary of the Faculty, we track a number of key committees.

**Figure 14. Percent Women Committee Members*
Physical & Biological Science Faculty Only**



*Faculty Senate, Divisional Committees, Graduate School Executive & Research Committees

A steady decline in the percentage of women participating on these important committees was evident up through the early years of WISELI. Recently (2005, 2006) a slight increase in the percentages of women on these committees is clear. Although the declines in women’s participation from 2000-2004 are striking, it is important to note that in most years, their representation on these four committees is still higher than their representation among full professors in their divisions (most of the faculty on these four committees are tenured.)

Findings: While declines in the participation of women on important campus committees from 2000-2004 look alarming, women’s participation has generally been consistent with their percentages of women eligible to serve on these committees. Nevertheless, these declines are recently reversing, and women are again over-represented on these committees (as compared to their representation among full professors in their divisions.)

Recommendations: Continue to track women’s participation in these important campus committees, and track the participation of ethnic and racial minorities as well.

Allocation of resources for biological and physical science faculty by gender

Salary. Women earn less than men in every industry, including academia. Nationally, the AAUP reports that women faculty earn 81% of the amount earned by men³. At UW-Madison,

³ West, Martha S. and John W. Curtis. 2006. “Organizing Around Gender Equity.” AAUP Gender Equity Indicators 2006. <http://www.aaup.org/AAUP/pubsres/research/geneq2006toc.htm>.

salary gender equity exercises are completed every five or ten years, the last exercise being completed in 2000/01. In 2002/03 a new policy was implemented to monitor equity on a more regular basis for individuals, at the time of their reviews⁴. A review of faculty perceptions of the gender pay equity studies and policies at UW-Madison was completed in April 2006 by WISELI⁵.

Given that adjustments to some women's salaries were made in 2000/01, and that a new policy was implemented in 2002/03 to continually monitor for salary inequities, it will be interesting to see whether salaries of men and women faculty are diverging over time.

Figure 15a. Women's Median Salary as % of Men's Median Salary
Physical Science Departments

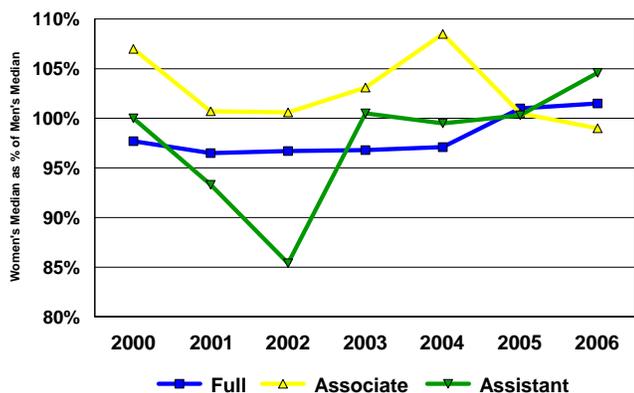
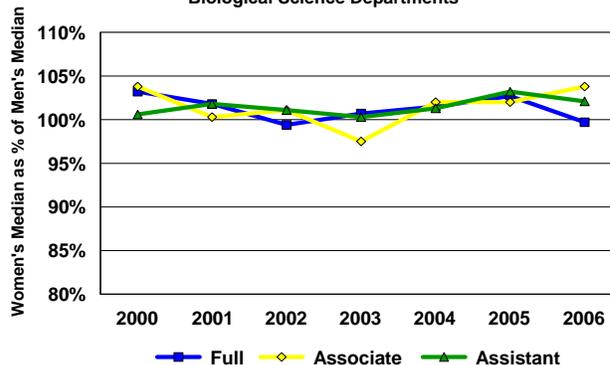


Figure 15b. Women's Median Salary as % of Men's Median Salary
Biological Science Departments



The first thing to note is that there is a great deal more variation in the PS departments than in the BS departments. 2002 was an especially bad year for women assistant professors in the PS departments, but then a correction seemed to occur immediately, and in the PS departments the women's median salary and the men's were practically identical. In the PS departments, women full professors' salaries were below men's for most of the period studied, but then reached equity in around 2005. In the BS departments, all ranks of faculty have median salaries that are approximately equal. Women's median salary, in fact, appear to be slightly greater than men's, and so a correction seemed to take place in 2006 bringing men's and women's medians back to even.

Findings: Except for some outliers (e.g., 2002 in the PS departments), men's and women's median salaries appear to be equitable when rank is controlled. When the ratios of men's and women's salaries begin to deviate too far from 100%, a self-correction seems to appear within one or two years. Using only the simple control of faculty rank, and measuring only the median salary, we find little evidence of salary inequity by gender.

Recommendations: Continue tracking women's median salary as a percentage of men's, but do not replace the periodic individual-level reviews done by the OBPA. The median salary indicator is only a rough guide to salary inequity, and use of the median can be masking large

⁴ Faculty Salary Equity Review policy. <http://www.provost.wisc.edu/salaryequitypolicy.html>.

⁵ Winchell, Jessica K. and Christine Maidl Pribbenow. April 2006. "Evaluation of the Gender Pay Equity Study and Equity of Faculty Salaries Policy at the University of Wisconsin-Madison."

inequities at the individual level. In addition, only rank and a very broad measure of discipline is controlled using this measure; much more detailed analysis must be done to assure equity. Finally, as with all other measures, similar tracking should be done for faculty in racial/ethnic minority groups.

Office and Laboratory Space

In their important 1999 report on the status of women in the School of Science at the Massachusetts Institute of Technology (MIT)⁶, Nancy Hopkins and her colleagues reported among other things that women faculty at MIT were allocated less lab space than their male colleagues. As a result of this finding, gender equity in lab space became an important indicator that was required as part of the “NSF 12.” In addition, and also modeled after the seminal MIT study, a study of lab and office space was included in the original WISELI proposal. Specifically, WISELI co-PIs said that the ADVANCE effort at the UW-Madison would examine “assigned space... and location of office and laboratory.” The ultimate space analysis we performed included office and lab square footage, but not office or lab location.

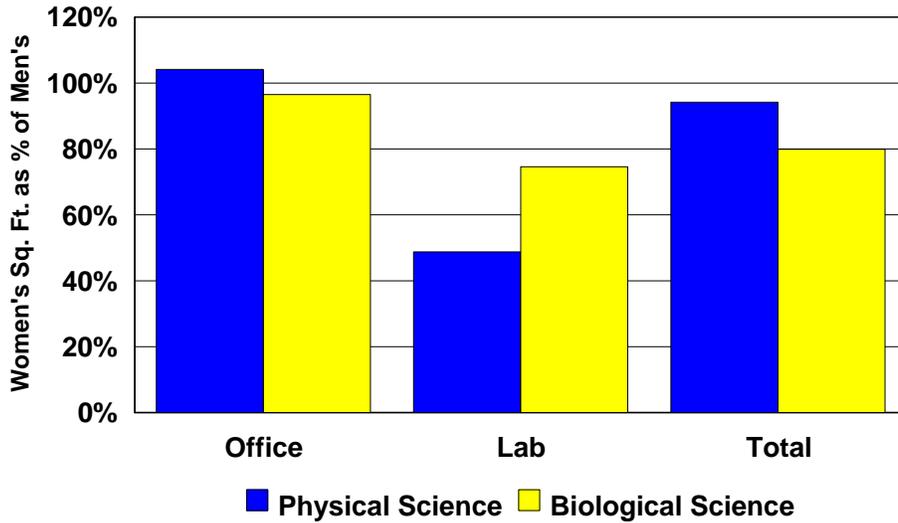
Data were gathered at the school/college level. Requests were made to the deans of the six schools/colleges with whom WISELI works⁷ for lists of faculty office and lab space square footage. Not all schools/colleges provided data in the same format, and some did not provide data at all. L&S provided only total space data (office and lab combined); CALS provided only office space data. And the Med School provided no data that was analyzable by gender. Engineering and VetMed provided excellent data. Significant resources would have had to be expended to gather data from the Med School, CALS and L&S regarding space; thus, we analyzed the data we were provided to the extent that we were able to generate a dataset that was comparable across schools/colleges.

In 2003, the required tables were produced for the annual report and for the site visit. Over all departments reporting office space, we find little difference in square footage between men and women; however, we do find a significant difference in the lab space allotted to men and women, such that women in the physical sciences have only about 50% of the lab space men have, and women in the biological sciences have about 75% of the lab space of men. In physical science departments, the gender difference in total space is very small, but in biological science departments, women have only about 80% of the total space that men have.

⁶ MIT Committee on Women Faculty. *A Study on the Status of Women Faculty In Science at MIT*. Boston, MA: Massachusetts Institute of Technology, 1999. <http://web.mit.edu/fnl/women/women.html> .

⁷ College of Engineering (Engr), College of Agricultural and Life Sciences (CALS), School of Veterinary Medicine (VetMed), School of Medicine and Public Health (Med), School of Pharmacy (Pharm), and College of Letters & Science (L&S).

Figure 16. Women's Space (Sq.Ft.) as % of Men's



Because the largest gender differences occur in the allotment of lab space, and because biological and physical science disciplines vary greatly in their needs for lab space, we wanted to control for the “need” for lab space in order to understand if the gender difference we are observing is a result of discriminatory practices, or merely the result of a correlation between the types of disciplines in which men and women are concentrated and the lab space needed to conduct that research. We reasoned that the need for large labs is correlated with grant funding; larger grants would be awarded in those disciplines where faculty need more equipment and more personnel, and therefore more lab space. Grant funding is a publicly-available variable at UW-Madison, and we created a database for individual faculty members that included their total grant dollars, their number of current grants, and a constructed variable that divides their total grant dollars by the duration of grants to obtain a “grant dollars per year” variable. We performed a multiple regression analysis, regressing lab square footage on gender and grant funding, measured in the three ways described above.

We found that controlling for grant funding (in any form of measurement) effectively removed the significant gender effect; that is, once grant funding was controlled, there was no longer a significant difference between men’s and women’s lab square footage. That is not to say that there was not still a difference. Controlling for grant funding, women faculty still had about 250 square feet of lab space less than men in the three colleges we studied, which is about the amount of space in an average faculty office.

Table 4. Gender Differences in Lab Space (Sq. Ft.) in Three UW-Madison Colleges*

	Model 1: Without Control			Model 2: With Control		
	B	SE	Pr> t	B	SE	Pr> t
Female	-355.97	(172.71)	0.0409	-252.66	(165.97)	0.13
Ln(Total Grant Dollars)				225.63	(39.93)	<.0001
Intercept	1019.13	(69.41)	<.0001	-2221.14	(577.89)	0.0002
Adjusted R-Square		0.0199			0.182	
N		160			156	

* College of Engineering, School of Veterinary Medicine, School of Pharmacy

Because office space, and total combined office/lab space, appear to be distributed fairly equitably by gender across those colleges studied, and because the significant gender differences in lab space disappeared once grant funding was controlled, we did not pursue any further action with regards to gender equity in lab space at the UW-Madison. We did not have enough evidence to pursue changes in policy or increased pressure on those colleges which did not provide specific lab square footage data for each faculty member. Now that leadership in each of the non-participating colleges has changed, the time may be right for a new look at this question of whether lab space at UW-Madison is allocated fairly.

Findings: Poor data did not allow for a complete gender analysis of lab space across all colleges. For those colleges who did provide the proper data, we found that any significant gender differences in laboratory space disappeared once grant funding was controlled.

Recommendation: Office and laboratory space data should be analyzed by gender and race/ethnicity at least every 5 years. Confounding variables such as grant funding, discipline, and tenure status should be included in any analysis of space.

Startup Packages and Starting Salary. In *Women Don't Ask: Negotiation and the Gender Divide*⁸, economists Linda Babcock and Sara Laschever report that women tend to not negotiate higher salaries and better startup packages than they are offered at the time of hire compared to their male peers. Starting out even slightly lower in salary or resources can build up over time to create large discrepancies later in the career. Monitoring starting salaries and startup packages for incoming faculty is thus vitally important.

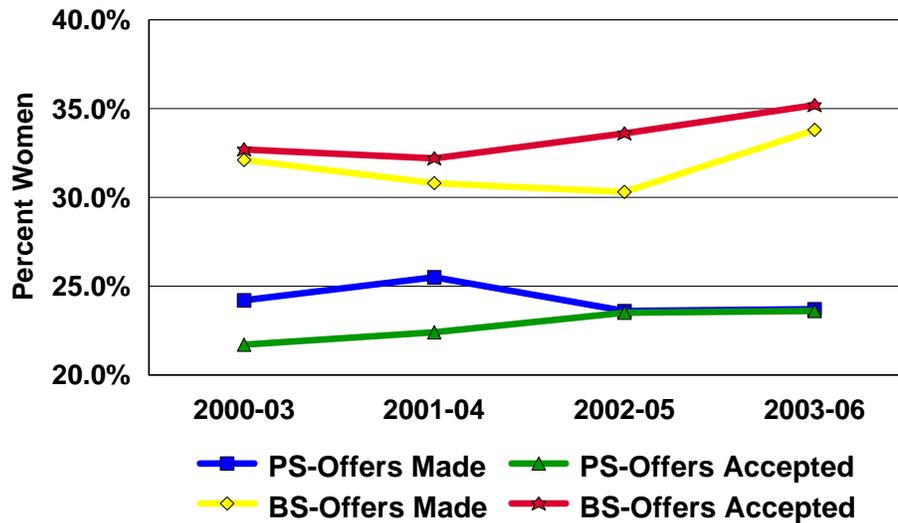
It took some time to arrange collection of the starting salary and startup data, as WISELI had to make arrangements with each of the 6 schools/colleges to obtain it; these data were not available centrally. In 2003, we collected the data for the first time, asking for the data back to 2000. As we began collecting these data, the Chancellor's and Provost's offices also became interested in startup and initial salary data for new hires, because the UW-Madison has been losing ground in

⁸ Babcock, Linda and Sara Laschever. 2003. *Women Don't Ask: Negotiation and the Gender Divide*. Princeton University Press.

recruiting excellent faculty due to budget cuts. The Chancellor and Provost asked OBPA to collect essentially the same data from all of the schools and colleges, and in 2005 WISELI was able to obtain these data from OBPA rather than collecting it ourselves. We add each year's data to our database, and report a 3-year rolling average in our indicators each year.

We report three outcomes using the offer data. First, we examine the gender distributions of offers made and offers accepted. It is helpful to know whether women in STEM are getting offers from UW-Madison but not accepting them, or whether they just aren't getting the offers, if increasing the numbers of women faculty is a goal.

Figure 17. Percent Female, New Faculty Offers



For new faculty offers in PS departments, in the earlier years there is a higher percentage of offers being made to women than are actually being accepted by women; that is, women are not accepting the offers made to them by PS departments. By the 2002-05 years, this seems to have been corrected, and now the percentages of women receiving offers is the same as those who accept them. An opposite pattern appears for BS departments. Fewer women are getting offers, compared to those who are accepting them. Thus, once an offer is made in a BS department, a female candidate is more likely to accept it than a male candidate. As with the PS departments, these rates may be converging in the later years.

We next looked at median starting salaries offered for men and women. Again, we considered the medians for all offers, and also for those who accepted offers; it may be that one group (e.g., women) are being offered lower starting salaries and thus are not accepting offers from UW-Madison. We looked at offers for junior and senior faculty separately:

Figure 18a. Women's Median Starting Salary as % of Men's Untenured Faculty Only

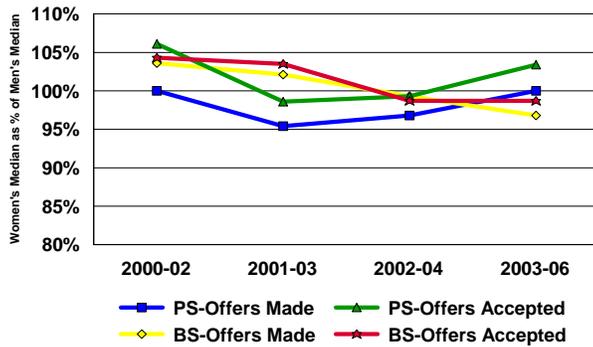
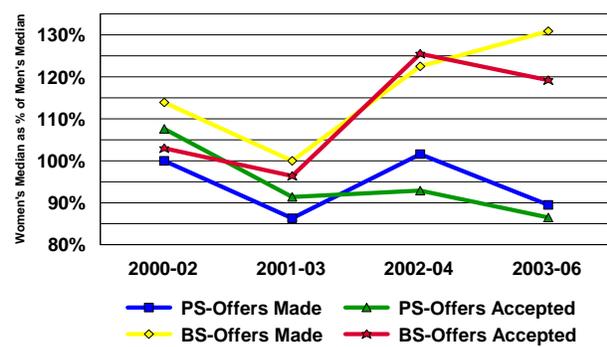


Figure 18b. Women's Median Starting Salary as % of Men's Tenured Faculty Only



For junior offers, it seems clear that when the offers are more equitable to male offers, there is a higher acceptance rate of women. The “offers accepted” lines are above the “offers made” lines in both the PS and BS departments. In BS departments, there appears to be a slight downward trend for junior faculty, such that men’s initial salary is slightly higher than women’s in the offers being made, but the offers accepted ratio is almost at parity. The story is different for senior women, however. In the PS departments, it is clear that women faculty are not in general getting initial salary offers in line with those of their male peers; both the offers made and offers accepted lines tend to be under 100% over the periods studied. The same is true in the BS departments at several points in time; however, at almost all points, the offers made and accepted by women senior candidates in BS departments were at least similar to men’s, if not much higher.

Finally, we examined startup packages. Although Toolkit 1 recommends separating startup packages into components for analysis (e.g., moving expenses, equipment, RAs/PAs, etc.), we found that looking at total startup was probably adequate for UW-Madison. The main reason is that most new faculty get all of their startup in one large fund. Even if the offer letter specifies how much they will receive for each spending category, in reality the funds are flexible and faculty can spend them any way they want upon arrival. A faculty member who does not spend his or her entire moving allowance does not lose the balance, but rather has that amount available to spend on a computer or towards a student hourly worker. The exception to this is course release.

We analyzed total startup in the same way we analyzed starting salaries—comparing the median for women to the median for men, by division and tenure status, in a rolling 3-year average.

Figure 19a. Women's Median Total Startup as % of Men's Untenured Faculty Only

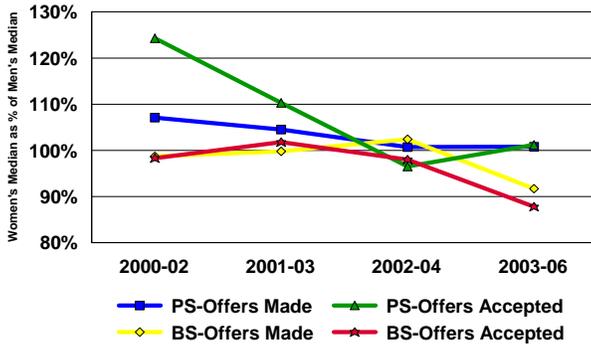
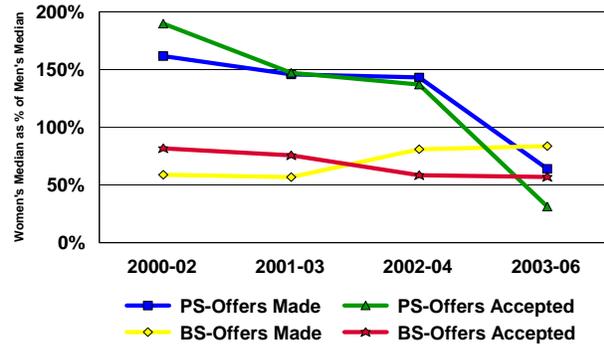


Figure 19b. Women's Median Total Startup as % of Men's Tenured Faculty Only



For junior faculty, there were clearly some women with very high startup that accepted offers at UW-Madison; over time, the influence of those extraordinary cases was removed, and total startup for junior faculty in the PS departments remained mostly equitable. In the BS departments, the trend has been towards equity for most years except the most recent one, where suddenly men were receiving much higher startup packages than women. An analysis of why the sudden drop would have to include a detailed look at the discipline; it could be that the BS faculty women were hired into less resource-intensive departments. For senior faculty, especially in the PS departments, there is a very wide variation in the equity of total startup packages. Earlier in the measurement period, women faculty in PS were receiving total startup packages approximately 50 percent higher than men's. Only in the last period has this trend completely reversed so that men are receiving packages 50% higher than women's. Again, a more detailed look by discipline would be appropriate. Especially in the PS departments, there is a wide range of startup needs—from a Mathematics professor who only needs a computer and some books, to a professor of biomedical engineering who needs major equipment, students, renovated space, etc. Startup packages for senior faculty in BS are consistently higher for men than for women hires over this period. Women's packages are about 25% lower than those for men. This might be an area where there is an equity problem for women.

Findings: Offers made, starting salary, and total startup appear to be equitable between men and women in UW-Madison PS and BS departments, although there are some notable exceptions that bear further analysis, particularly at the senior level. In the PS departments, senior women's starting salaries and total startup are falling below parity in recent years, and in BS departments, senior women's total startup is consistently lower than men's. Further analysis could reveal whether this is an effect of working in disciplines with varying needs for startup and salary, or whether this effect is truly based on gender.

Recommendations: Continue to track offers, starting salary, and startup. Reporting median starting salary and startup funds only for all offers would be adequate; additional analyses of medians for accepted offers could be performed if needed. Reporting the range of salary and startup is also probably not necessary. A new analysis of equity in who receives teaching release would add valuable information to these analyses, although it would be necessary to ensure that these data have been collected uniformly across all colleges (some colleges only report a total startup number and do not specifically note when a teaching release has been

granted.) As with all other indicators in this report, similar analyses for racial/ethnic groups should be added.

Summary of Findings and Recommendations

As WISELI moves forward without major support from NSF, we have the opportunity to refine the collection of our “indicator” data, retaining those indicators which have been useful, modifying those that are important but not quite what are needed, and eliminating those that do not inform about the status of women faculty in the BS and PS departments at the UW-Madison. We also have the opportunity to look at the trends over the past five years, and determine some future directions for WISELI.

In the future, WISELI should continue to annually track (Table numbers refer to ORIGINAL NSF 12 indicator):

- Numbers and percentages of women faculty (FTE), by department and rank (Table 2)
- Tenure promotion outcomes by gender (Tables 3a and 3b)
- Attrition rates by gender (Table 5b)
- Numbers and percentages of women new hires, by department and tenure status (Table 13)
- Numbers and percentages of women faculty in department chair, dean, center director, and central administration positions (Tables 7a-7d)
- Numbers and percentages of women faculty receiving endowed/named professorships (Table 8)
- Numbers and percentages of women faculty receiving Vilas Associate, Hilledale, Romnes, and WARF Kellet awards (Table 8)
- Numbers and percentages of women faculty serving on key campus committees, especially Faculty Senate, Divisional Committees, and Graduate School Executive and Research Committees (Table 9)
- Median salary of women and men faculty, by rank and department (Table 10b)
- Startup packages, starting salaries, and offers made to men and women faculty, by department and tenure status (Tables 12a-12c).

Changes to the process followed in the past include:

- No longer need to report Tables 1, 4, 5a, 6, 10a
- Named professorships and major campus awards (Table 8) should be broken out by division as well as by funding/award source
- University committee membership should be broken out by division (Table 9)
- Ranges of starting salary and startup packages need not be reported in Tables 12b and 12c
- Only the most recent year of new hire demographics need be reported in Table 13.

Some indicators need to be collected/analyzed only every five years, including:

- Numbers and percentages of women on non-tenure-track positions, by track (research, teaching, clinical) and division (Table 6)

- Office and laboratory space by department and gender, with controls for rank and grant funding (Tables 11a-11c)
- A report such as this reporting 5-year trends in gender equity should be prepared and disseminated.

Some additional recommendations for future directions of WISELI based on the findings above include:

- Data that is parallel to all of the tables and reports outlined above should be collected to ascertain the status of faculty of color at the UW-Madison, including a 5-year report similar to this gender equity report
- Investigate in detail the slight decline in percentage of women assistant professors in BS departments from 2000-2006
- Use exit interviews to more fully explore the differential attrition rates between men and women faculty in the PS and BS departments
- Investigate the lack of women recipients of the following: Wisconsin Distinguished Professorships, Steenbock Professorships, and BS awards of Hilldale, Romnes, and Kellet awards
- Encourage the Graduate School to provide annual data on the gender and racial makeup of both applicant pools and awards for the major campus awards they control
- Ensure that the campus engages in a gender pay equity study (and perhaps a faculty of color pay equity study) every five to seven years
- Perform a new space analysis, and explore ways to analyze office/lab *location* as an enhancement of this study.

Overall, the “NSF 12” indicators provide evidence that real progress in WISELI’s mission—to increase the participation and advancement of women in academic science and engineering—has been made. Compared to 2000, there are more women faculty, and women are a higher percentage of the faculty, in BS and PS departments in 2006. In 2006, we have many more women department chairs in BS and PS departments than we did in 2000. Tenure rates for men and women have equalized in the past five years (i.e., women are no longer differentially leaving prior to a tenure decision), and men’s and women’s salaries are approximately the same once rank and division are controlled. Still, there are areas needing improvement. Women still leave the UW-Madison at higher rates than men; they may have less lab space than their male peers, and no change or negative change was observed in the numbers of women directing major centers and institutes in the BS and PS departments. Tracking the gains and uncovering the remaining problem areas are crucial to the efforts of WISELI and the UW-Madison administration to achieve gender equity. Continued collection, reporting, and analyses of these gender equity indicators are imperative to achieve this goal.

Appendix 1: The Original NSF 12 Indicators

(Reproduced from “Toolkit for Reporting Progress Toward NSF ADVANCE: Institutional Transformation Goals, Appendix 1.” Pages 24-25.)

Evolution of the Reporting Requirements

How did these reporting requirements evolve? In April 2002, the nine first-round ADVANCE: IT awardees met at their first PI meeting. The last session of the meeting consisted of a brainstorming session and discussion about what data we thought would be essential to collect to document women’s relative status. The 1999 MIT Report formed the basis for much of the discussion. There were a number of issues that were important during the discussion. First, the ADVANCE: IT awards had been set up as cooperative agreements, which meant that awardees would have a certain amount of leverage to gain access to data that is sometimes not readily available. So, during the discussion, there was a strong sense that this was an opportunity to have more comprehensive data than what we may have been able to previously access given that our institutions had formally agreed to do so. Second, there was much debate concerning the “ease” of collecting each of the indicators. After the list of indicators had been generated representatives from each school indicated the ease with which they thought they could comply with the reporting requirement:

- (1) “can do easily”
- (2) “not easy, but would like to do”
- (3) “just can’t do, i.e., no way”

After discussing these issues, the group agreed on 12 indicators of institutional transformation, which are shown later in this appendix. In addition to the 12 initial indicators, the group reached a consensus that data from climate surveys, productivity analysis, and analysis of family/work friendly policies would also be important to gather. At the time, none of the institutions had collected all of the data or set up reporting for the indicators, so the first-round awardees informally collaborated with each other on how to set up tables for reporting. Finally, the first round awardees were keenly aware of the opportunity to collect a number of indicators across institutions to serve both an evaluative purpose for the ADVANCE: IT program and a research purpose of understanding the impact of different approaches to institutional change upon women’s status in STEM. The PIs were interested in developing a dataset that could be used to accomplish these goals, while serving as a model for other institutions that wanted to study the status of women.

For the 2003 PI meeting, Frehill attempted to compile a common dataset based upon the reports of all ADVANCE: IT institutions⁹. She found that it was impossible to make the kinds of comparisons that were originally of interest to ADVANCE: IT awardees. At the 2004 ADVANCE conference she presented a new set of indicators. This presentation led to the formation of the ADVANCE: IT Indicators Working Group, which convened in January 2005, under Lisa Frehill’s leadership, to evaluate the previous recommendations and make new ones.

⁹ Frehill examined reports or data from: UC-Irvine, University of Colorado, Georgia Tech, University of Michigan, NMSU, University of Washington and University of Wisconsin.

(Reproduced from "Core Data.doc"; list of indicators generated at the April 2002 ADVANCE PI meetings. NSF: Washington, DC.)

Baseline – 2000 and 2001

Rate: (1) Can do easily

(2) Not easy but would like to do

(3) Just can't do – i.e., no way

[Where possible, it would be helpful to have ethnicity on many outcomes.]

Number and percentage of women faculty in science/engineering

- by dept.

Number of women in tenure-line positions by rank

- by department

- by ethnicity (?)

Tenure promotion outcomes – baseline (handful of years prior to) and during grant

Years in rank by gender

Time at institution and differential attrition

Numbers of women in non-tenure track positions

- teaching

- research

Number and percent of women scientists and engineers in administrative positions (from chair up, including Center/Institute Directors)

Number of women scientists and engineers in endowed/named chairs

Number and percentage of women scientists and engineers on promotion and tenure committees (college-wide and higher)

Salary of scientists and engineers (controlling for department, rank, years in rank)

Space allocation by faculty (women versus men faculty with additional controls)

Start-up packages (desirable; need to be able to be clear about components, including controls)

(Reproduced from "Rankings-numbered.doc"; list of indicators generated at the April 2002 ADVANCE PI meetings. NSF: Washington, DC.)

Outcome	1	2	3
1. # and % of women faculty in science/engineering by department	9		
2. # and % of women I tenure-line positions by rank and department	9		
3. Tenure promotion outcomes by gender	4	5	
4. Years in rank by gender	8	1	
5.a. Time at institution and b. attrition by gender	9, 5	0,3	0,1
6. # of women in S & E who are in non-tenure-track positions (teaching and research)	5	3	1
7. # and % of women scientists and engineers in administrative positions	8	1	
8. # of women S & E faculty in endowed/named chairs	5	4	
9. # and % of women S & E faculty on promotion and tenure committees	7	2	
10. Salary of S & E faculty by gender (controlling for department, rank, years in rank)	6	3	
11. Space allocation of S & E faculty by gender (with additional controls such as dept., etc.)	4	2	3
12. Start-up packages of newly hired S & E faculty by gender (with additional controls such as field/department, rank, etc.)	3	4	2

Baseline – 2000 and 2001

Rate: (1) Can do easily

(2) Not easy but would like to do

(3) Just can't do – i.e., no way

Non-institutional Indicators

Climate

Productivity

Family/work-friendly policies

Appendix 2: Departmental Division Assignments

Physical Sciences

Biological Systems Engineering
Soil Science
Chemical & Biological Engineering
Civil & Environmental Engineering
Electrical & Computer Engineering
Biomedical Engineering
Industrial Engineering
Mechanical Engineering
Materials Science & Engineering
Engineering Physics
Engineering Professional Development
Astronomy
Chemistry
Computer Sciences
Geology & Geophysics
Mathematics
Atmospheric & Oceanic Sciences
Physics
Statistics

Biological Sciences

Agronomy
Animal Science
Bacteriology
Biochemistry
Dairy Science
Entomology
Food Microbiology & Toxicology
Food Science
Genetics
Horticulture
Nutritional Sciences
Plant Pathology
Forest Ecology & Management
Natural Resources - Wildlife Ecology
Kinesiology
Nelson Institute for Environmental Studies
Botany
Communicative Disorders
Zoology
Anatomy

Anesthesiology
Biostatistics & Medical Informatics
Family Medicine
Genetics
Obstetrics & Gynecology
Medical History & Bioethics
Human Oncology
Medicine
Dermatology
Medical Microbiology
Medical Physics
Neurology
Neurological Surgery
Oncology
Ophthalmology & Visual Sciences
Orthopedics & Rehabilitation
Pathology & Laboratory Medicine
Pediatrics
Pharmacology
Biomolecular Chemistry
Physiology
Population Health Sciences
Psychiatry
Radiology
Surgery
School of Pharmacy
Animal Health & Biomedical Sciences
Medical Sciences
Pathobiological Sciences
Comparative Biosciences
Surgical Sciences

Social Studies

Agricultural & Applied Economics
Life Sciences Communication
Rural Sociology
Natural Resources-Landscape Architecture
Urban & Regional Planning
School of Business
Counseling Psychology
Curriculum & Instruction
Educational Leadership & Policy Analysis
Educational Policy Studies
Educational Psychology
Rehabilitation Psychology & Special Education
School of Human Ecology
Law School

Anthropology
Afro-American Studies
Communication Arts
Economics
Ethnic Studies
Geography
LaFollette School of Public Affairs
School of Journalism & Mass Communication
School of Library & Information Studies
Political Science
Psychology
Social Work
Sociology
Urban & Regional Planning
School of Nursing
Professional Development & Applied Studies

Humanities

Art
Dance
African Languages & Literature
Art History
Classics
Comparative Literature
East Asian Languages & Literature
English
French & Italian
German
Hebrew & Semitic Studies
History
History of Science
Linguistics
School of Music
Philosophy
Scandinavian Studies
Slavic Languages
Languages & Cultures of Asia
Spanish & Portuguese
Theatre & Drama
Women's Studies Program
Social Sciences
Liberal Studies & the Arts

Appendix 3: Gender Equity in Four Major Graduate School Awards and Honors



Gender Equity in Four Major Graduate School Awards and Honors

In March, 2005, the recipients of the Romnes Fellowships and the Kellett Mid-Career awards were announced, and none went to women in the biological or physical sciences divisions. Concerned that there might be gender bias inherent in the process for choosing these awards, the Graduate School researched and made available data on the gender distribution of the nomination pools and awards for these and two other prestigious honors chosen by the Graduate School Research Committees (Vilas Associate awards, and WARF Professorships.)

To answer the question of whether there is gender bias in the selection of recipients of four major Graduate School awards, it is important to look separately at the nomination pools and the awards, because the remedy might be different depending on the stage in the process at which women become underrepresented. Table 1 presents the actual numbers of women and men being nominated for and achieving four Graduate School honors, while table 2 calculates the probability of achieving at least the observed numbers of women in the nomination pool and awards, given the numbers available at the previous stage, and assuming each person has an equal chance at making it to the next stage. For example, in 2000-2003, approximately 9.0% of all faculty in physical sciences are women. The probability is .3842 that of the 70 nominations for the Vilas Associate Award received, at most 5 were nominations for women—less than even odds. Throughout Table 2, I have set to **BOLD** those probabilities less than 0.5 as indicating cases where women are underrepresented, given their availability and assuming equal chances of selection. The findings include:

1. Although it looks bad to see so few women in the Physical Sciences receiving these awards, considering the pool there is really fairly good representation in both the nomination and award pool in the last three years. The exception is the Kellett Mid-Career Award, but even that is not completely improbable, given that only three were awarded in the past three years.
2. Things seem to be getting worse for women in the Biological Sciences Division. For most of the awards (all but Vilas), the probability of having so few women in the award group is small, given the nomination pool. There are few Biological Sciences women being chosen for these honors, and at the same time the percentage of women in the nomination pool is rising, making

these omissions especially glaring. No women in Biological Sciences have won a Romnes, Kellett, or WARF professorship since 2001/02, despite being 20%-30% of the nomination pools. The good news is that discrepancies in the nomination pools for Biological Sciences that existed in the 2000-03 timeframe seem to have disappeared in the current (2003-06) period.

3. The problems for the Social Studies and Humanities divisions occur primarily at the highest level of award—the WARF named professorships. Both divisions have a rather bad record of nominating their women faculty for these professorships (in the 2000-03 period, only 8.3% of Social Studies nominations were for women, out of a pool that is approximately 27.3% women! This improved by 2003-06, but is still not equitable.) In addition, the Humanities division did not award even one of these professorships to women in the 2003-06 period—a double-whammy.

From these observations, some recommendations:

1. While all of these committee members could undoubtedly do with some education about the effects of biases and assumptions on the evaluation process, the Biological Sciences committee in particular might be a good place to start.
2. While all Department Chairs need reminders about the importance of nominating their women faculty for awards and honors, those in the Social Studies and Humanities divisions in particular seem to need a nudge. Perhaps these departments less often have standing awards committees?
3. Are the chairs preparing nomination packets for women that are as good as the ones prepared for men? These data tell us little about the actual content of the nomination packets. Letters are such an important part of the nomination packages for these awards, and we know that letters written for women tend to have many features that would downgrade the women's accomplishments (Trix and Psenka 2003). Perhaps all faculty, especially department chairs, need training on how to write a good letter of recommendation that is free of bias.

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April 21, 2005

Table 1. Selected Graduate School Awards and Nominations, by Gender

	2000-2003						2003-2006					
	Nominations			Awards			Nominations			Awards		
	Women	Men	% Women	Women	Men	% Women	Women	Men	% Women	Women	Men	% Women
Vilas (All Ranks)												
Physical Sciences	5	65	7.1%	4	30	11.8%	9	35	20.5%	4	14	22.2%
Biological Sciences	11	31	26.2%	6	21	22.2%	10	12	45.5%	5	4	55.6%
Social Studies	27	32	45.8%	13	21	38.2%	16	30	34.8%	7	15	31.8%
Humanities	35	30	53.8%	21	14	60.0%	24	35	40.7%	12	17	41.4%
ALL DIVISIONS	78	158	33.1%	44	86	33.8%	59	112	34.5%	28	50	35.9%
Romnes (Associate)												
Physical Sciences	3	16	15.8%	1	3	25.0%	2	17	10.5%	1	3	25.0%
Biological Sciences	4	20	16.7%	1	5	16.7%	6	14	30.0%	0	4	0.0%
Social Studies	6	6	50.0%	2	2	50.0%	9	11	45.0%	2	2	50.0%
Humanities	6	7	46.2%	1	3	25.0%	6	9	40.0%	3	1	75.0%
ALL DIVISIONS	19	49	27.9%	5	13	27.8%	23	51	31.1%	6	10	37.5%
Kellett (Full)												
Physical Sciences	1	20	4.8%	1	4	20.0%	4	14	22.2%	0	3	0.0%
Biological Sciences	2	30	6.3%	0	5	0.0%	9	27	25.0%	0	5	0.0%
Social Studies	5	16	23.8%	2	3	40.0%	6	15	28.6%	2	2	50.0%
Humanities	7	13	35.0%	1	4	20.0%	10	15	40.0%	1	2	33.3%
ALL DIVISIONS	15	79	16.0%	4	16	20.0%	29	71	29.0%	3	12	20.0%
Named Professorship (Full)												
Physical Sciences	0	13	0.0%	0	5	0.0%	3	13	18.8%	1	3	25.0%
Biological Sciences	0	18	0.0%	0	5	0.0%	5	20	20.0%	0	3	0.0%
Social Studies	1	11	8.3%	0	3	0.0%	3	11	21.4%	1	2	33.3%
Humanities	2	5	28.6%	2	1	66.7%	3	9	25.0%	0	4	0.0%
ALL DIVISIONS	3	47	6.0%	2	14	12.5%	14	53	20.9%	2	12	14.3%

Table 2. Binomial Probability of Gender Composition for Selected Graduate School Awards

	2000-2003					2003-2006				
	% women			Probability		% women			Probability	
	Pool	Nominations	Awards	Nominated	Awarded	Pool	Nominations	Awards	Nominated	Awarded
Vilas (All Ranks)										
Physical Sciences	9.0%	7.1%	11.8%	0.3842	0.9081	10.7%	20.5%	22.2%	0.9843	0.6991
Biological Sciences	19.6%	26.2%	22.2%	0.8948	0.4146	21.5%	45.5%	55.6%	0.9970	0.8271
Social Studies	33.7%	45.8%	38.2%	0.9805	0.2403	35.3%	34.8%	31.8%	0.5404	0.4822
Humanities	37.0%	53.8%	60.0%	0.9980	0.8155	39.8%	40.7%	41.4%	0.6080	0.6088
ALL DIVISIONS	24.3%	33.1%	33.8%	0.9991	0.6162	26.2%	34.5%	35.9%	0.9936	0.6511
Romnes (Associate)										
Physical Sciences	13.1%	15.8%	25.0%	0.7692	0.8800	8.6%	10.5%	25.0%	0.7787	0.9425
Biological Sciences	23.2%	16.7%	16.7%	0.3171	0.7368	26.6%	30.0%	0.0%	0.7327	0.2401
Social Studies	43.1%	50.0%	50.0%	0.7817	0.6875	36.7%	45.0%	50.0%	0.8409	0.7585
Humanities	44.8%	46.2%	25.0%	0.6487	0.3723	46.2%	40.0%	75.0%	0.4140	0.9744
ALL DIVISIONS	30.2%	27.9%	27.8%	0.4002	0.6848	29.3%	31.1%	37.5%	0.6114	0.7983
Kellett (Full)										
Physical Sciences	5.7%	4.8%	20.0%	0.6583	0.9794	8.1%	22.2%	0.0%	0.9881	0.4705
Biological Sciences	12.5%	6.3%	0.0%	0.2182	0.7242	13.6%	25.0%	0.0%	0.9813	0.2373
Social Studies	27.3%	23.8%	40.0%	0.4711	0.9086	30.4%	28.6%	50.0%	0.5339	0.9267
Humanities	32.0%	35.0%	20.0%	0.7071	0.4284	34.1%	40.0%	33.3%	0.7992	0.6480
ALL DIVISIONS	18.2%	16.0%	20.0%	0.3382	0.7957	20.4%	29.0%	20.0%	0.9849	0.3268
Named Professorship (Full)										
Physical Sciences	5.7%	0.0%	0.0%	0.4636	1.0000	8.1%	18.8%	25.0%	0.9651	0.8381
Biological Sciences	12.5%	0.0%	0.0%	0.0902	1.0000	13.6%	20.0%	0.0%	0.8868	0.5120
Social Studies	27.3%	8.3%	0.0%	0.1205	0.7703	30.4%	21.4%	33.3%	0.3427	0.8819
Humanities	32.0%	28.6%	66.7%	0.6009	0.9767	34.1%	25.0%	0.0%	0.3712	0.3164
ALL DIVISIONS	18.2%	6.0%	12.5%	0.0123	0.9327	20.4%	20.9%	14.3%	0.6072	0.4150