

Summary of Analyses of the Survey of the Climate for Women Scientists and Engineers in 2001 and 2005¹

UM NSF ADVANCE Project March 2005

Introduction

In February 2005 a brief web survey was sent to all instructional track women scientists and engineers (N=202) on campus to assess their current experiences of the climate and to learn if they perceive any changes in the climate since the ADVANCE baseline survey was completed in the fall 2001. To enable these comparisons, survey questions were limited to specific climate questions asked in the 2001 survey as well as a job satisfaction rating. In addition, three open-ended questions about how the climate had changed positively and negatively, as well as suggestions for new efforts ADVANCE could make, were included. A copy of the survey is appended to this report.

Although the report was intended to assess changes in the climate as a function of changes in the UM environment since the ADVANCE program was initiated in Fall 2002, the more immediate national context may have played an unexpected and unintended role. On January 14, President Larry Summers of Harvard made public statements at a conference about women and science that generated a firestorm of media attention throughout January and February. He apologized for his remarks on January 19, and there was active national coverage (e.g., in the *New York Times* and the *Chronicle of Higher Education*, continuing throughout February (for a compendium of media coverage, see <http://wiseli.engr.wisc.edu/news/Summers.htm>). This national context certainly provoked on-campus commentary on the issue, and may well have contributed negatively to the climate for women scientists in the short term. For example, one senior female faculty member wrote to ADVANCE staff, "I am afraid that it is providing validation for all of the people who agree with Summers but were not willing to say anything before."

We received a total of 84 responses to the 2005 survey, which represented a 42% response rate, nearly comparable to the 52% response rate for instructional track women scientists and engineers we had in 2001 (when we permitted responses over a substantially longer period of time). In order to replicate analyses conducted for the original climate study we dropped respondents from the School of Nursing from both samples, since its demographic makeup is so different from the other Schools and Colleges². As a result, we compared 77 respondents in 2005 to 113 in 2001.

Analysis Strategy

We looked at four groups of closed-ended items that assessed the climate in both surveys (2005 and 2001): one group of 10 adjectives that described the climate in general; a group of 9 items

¹ This report was prepared by Janet E. Malley, Keith Rainwater and Abigail Stewart of the UM-ADVANCE staff.

² Separate analyses conducted including respondents from the School of Nursing (15 respondents in 2001 and 7 in 2005) showed that results were generally comparable to the results represented in this report, suggesting that the climate for women in the School of Nursing is, in many ways, comparable to the climate experienced by other instructional track women scientists and engineers.

that directly assessed the gender dynamics in the department; a group of 5 items that assessed felt surveillance (or a sense of being under “observation”); and two items that assess gender and race “tokenism” or serving as a representative of one’s group. Finally, we had 15 items assessing the chair’s characteristics. We analyzed these items in terms of:

- differences in ratings between 2005 vs. 2001;
- differences in ratings between recently hired faculty in 2005 and those who had been here since 2001 or longer;
- differences in ratings between women of color and white women;
- differences in ratings by College.

In addition, we considered whether rank made a difference, which it did not, in any of the analyses.

We also coded responses to the three open-ended questions into themes. We examined whether climate ratings related to these themes and to job satisfaction in 2005, as it had in 2001.

Analysis of Climate Survey Items³

Differences between the two times (2005 vs. 2001)

The overall climate was rated as significantly more friendly (vs. hostile), more collegial (vs. contentious), and more individualistic (vs. collaborative) by women respondents in 2005. There was a nearly-significant trend for the overall climate to be rated as more non-sexist (vs. sexist). The only difference in rated gender dynamics was that in 2005 the item “Some faculty have a condescending attitude toward women” was rated higher. The only difference in felt surveillance and tokenism was that the item, “I constantly feel under scrutiny by my colleagues” was rated higher in 2005. See Table 1 for a summary of these results. These analyses were repeated including only women faculty who had been on campus for at least one year (i.e., excluding those new to campus for each data collection) and the findings were consistent with analyses using the total samples.

These findings indicate some modest, yet real, improvements in the climate so that women faculty appear to be experiencing a less sexist and more positive environment than they did in 2001. In describing the positive changes they’ve noticed since ADVANCE was initiated, several respondents pointed to the increased hiring of women—and improved search procedures—leading to better faculty compositions; more women in leadership positions; and improved mentoring procedures for new male and female faculty. One respondent noted,

There has been increasing pressure on the department to deal in more effective ways with the various ways that discrimination and bias affect the advancement of women on our faculty. Because of this pressure, there has been less overt sexism and a greater attempt to at least appear fair. I think the same is true of the University at large.

Another agreed that “real attempts are being made to make the department a more welcoming place for everyone. There’s also been a significant emphasis (with some real

³ Note: all reported differences are at the .05 or higher level of significance. Trends are reported at the .10 level of significance.

success) at diversifying the faculty.” A third respondent described the positive changes she has witnessed:

The issue of diversity is definitely on the table, and definitely more so than before fall 2002. There is more awareness of the need for creating a supportive work environment for women, and better understanding of what it takes to make this happen. There is a conscious effort to recruit more women. I attribute all this to the ADVANCE initiative that continuously puts the issue on the table, and forces departments to deal with it.

New leadership was mentioned by several as a positive change. One respondent observed, “The appointment of a woman chair who understands and genuinely embraces diversity (especially gender) issues is a welcoming change. She is the first chair with whom I feel comfortable discussing difficult professional issues without feeling there may be negative consequences.” And several pointed to changes at higher administrative levels that have been beneficial as well.

While many respondents pointed to the positive effects of increased attention to issues of diversity and climate from ADVANCE, some of the findings suggest that this increased interest may have also had the unintended effect of focusing unwanted attention on the women faculty. For example, it is interesting to note that analyses from open-ended responses (reported below) found that women who mentioned increased attention to the issue as a positive thing also rated their departmental gender dynamics negatively and the environment as less tolerant. One respondent noted, “None of us really expects things to get better because we are caught in a double bind. If we bring up the issues, the men take it as a [personal] criticism.... If we don’t bring it up, it will never change.” Others mentioned experiences of backlash as a result of the ADVANCE program. One respondent commented on “the sentiment that the University is ‘forcing the departments to relax their standards in order to add women faculty,’” (not, of course, the goal of ADVANCE or “the University” at all), resulting in the “polarization of faculty.” It is possible that the negative aspects of this attention may have been heightened by the debate unleashed by Summers’ comments. Nevertheless, it is important to recognize the potential consequences for women.

Differences within the 2005 sample

Comparison between newly-hired faculty in 2005 and continuing faculty. The overall climate was rated as significantly more friendly (vs. hostile), more collegial (vs. contentious), and more nonsexist (vs. sexist) by faculty who were newly hired.

Gender dynamics were also rated significantly differently on three items. Newer faculty were less likely to endorse “Men receive preferential treatment in the areas of recruitment and promotion”; “Men are more likely than women to receive helpful career advice from colleagues”; and “Sex discrimination is a big problem in my department.” They were nearly-significantly ($p < .10$) more likely to endorse, “There is equal access for both men and women to lab/research space” and “In meetings people pay just as much attention when women speak as when men do.”

New faculty were significantly less likely to report that “I have to work harder than I believe my colleagues do, in order to be perceived as a legitimate scholar.” And they tended nearly significantly ($p < .10$) not to feel that “My colleagues expect me to represent ‘the point of view’ of my gender.” See Table 2 for a summary of these results.

These data suggest that new women faculty in particular are finding the environment a more welcoming one. We conducted similar analyses for these same variables with the 2001 sample to learn if this is a real change, or simply the effect of being new to the environment. The results from the 2001 data demonstrated only a trend for three of the above mentioned items (“Sex discrimination is a big problem in my department”; “There is equal access for both men and women to lab/research space”; and “In meetings, people pay just as much attention when women speak as when men do.”) and no difference on the other items. These results provide some evidence that the campus climate may truly be improving for women scientists and engineers and that the experiences of new women faculty (who are, perhaps, less wary and skeptical than continuing women faculty who may have a history of negative experiences) are an important indication of that change.

Comparison between women of color and white women. Women of color did not rate any of the overall climate items or the gender dynamics items differently from white women. They did rate two of the items assessing “felt surveillance” significantly higher: “I have had to work harder than I believe my colleagues do, in order to be perceived as a legitimate scholar” and “Others seem to find it easier than I to ‘fit in.’” In addition, women of color rated “My colleagues expect me to represent the ‘point of view’ of my race/ethnicity higher than did white women. These findings are consistent with results from the 2001 survey suggesting that women of color face particular difficulties in the climate beyond those faced either by men of color or white women.

Comparison among Colleges. Respondents were asked to identify the College of their funded appointment(s). These data were used to group respondents by the three large Colleges (College of Engineering, College of Literature, Sciences and the Arts and Medical School) and all other schools combined (Dentistry, Information, Kinesiology, Natural Resources, Pharmacy, and Public Health). On overall climate items there were three differences. The Medical School faculty rated the following items significantly higher than did faculty from the other schools: non-racist (vs. racist), diverse (vs. homogeneous), and non-homophobic (vs. homophobic). There were no College differences on any of the other items.

Relationship of job satisfaction to the climate ratings

As was true of the 2001 ratings, climate ratings in 2005 were strongly correlated with overall satisfaction with your current position at UM. A scale composed of the adjectives assessing the overall climate in the department was correlated .72 ($p < .001$) with job satisfaction; a scale composed of the items about negative gender dynamics was correlated -.57 ($p < .001$), felt surveillance was correlated -.60; and tokenism was correlated -.35. Three scales based on the items about the chair’s characteristics were also correlated with job satisfaction: chair fairness was correlated .56 ($p < .01$), chair creates a positive environment was correlated .58 ($p < .01$), and chair’s is committed to racial-ethnic diversity was correlated .40 ($p < .01$).

Analysis of Open-Ended Questions

The responses to the three open-ended questions were content coded according to the following themes.

Positive changes

The first question asked, “Please describe any positive changes in the climate in your department/unit as well as the University as a whole since Fall 2002.” A total of 41 individuals provided responses to this question. These responses focused on four general themes:

- **improvements in departmental, college/school and university leadership** through the appointment of department chairs, deans and executive officers (both male and female) who are more sensitive to diversity and climate issues (N=19);
- **increases in the number of women faculty** (and supportive male faculty members) recruited, hired and retained by science and engineering departments at the University in an attempt to diversify the faculty (N=17);
- **increases in the amount of attention given to issues of diversity and climate** (e.g., salary and space equity, sexual harassment, creating a supportive work environment for women, career advising/mentoring, family friendly policies, domestic partnership benefits) at the department, college/school and university levels (N=16); and
- additional **opportunities for networking** and informal interactions with fellow women science and engineering faculty, both of which have engendered a greater sense of community and collegiality (N=9).

Two respondents reported no positive changes in the climate in their department/unit as well as the University as a whole since Fall 2002.

Negative changes

The second question asked, “Please describe any negative changes in the climate in your department/unit as well as the University as a whole since Fall 2002.” Thirty individuals responded to this question; their responses focused on five general themes:

- **decreased resources** due to University budget constraints, increased difficulty in obtaining external funding and increased pressure to produce, which has led to more divisiveness among some faculty members (N=9);
- varying degrees of **backlash** (by male and female faculty) and **resistance** in response to ADVANCE initiatives and the increased focus on “issues concerning fairness in the way women faculty are perceived, evaluated and treated” (N=9);
- continued **problems with department chairs and deans** (both male and female) who are not well-suited as administrators and/or are not sensitive to issues of diversity and climate (N=6);
- increased **feelings of loneliness and isolation**, due to the lack of a critical mass of women and supportive male faculty and/or the loss of an administrator who is sensitive to issues of diversity and climate (N=4).
- **inadequate recognition** of the many ways in which women science and engineering faculty contribute to their department/unit, particularly in the areas of

leadership/administration, service, counseling and scholarship, or the fact that a disproportionate amount of service, etc. is demanded of female faculty (N=3);

Five respondents reported no negative changes in the climate in their department/unit as well as the University as a whole since Fall 2002.

Suggestions for improving the climate

The final question asked “Can you suggest any new initiatives you think UM ADVANCE should begin that might be helpful in improving the climate?” Thirty-four women provided suggestions. These are grouped according to those that address current ADVANCE initiatives and those that fall under broader institutional responsibilities:

Continuation of ADVANCE program initiatives:

- Network of Women Scientists: Build upon the success of the current Network by linking women science and engineering faculty who share common research interests and foster “scientific communication;” continue with workshops (including academic survival skills); and increase opportunities for social interactions/activities.
- Continue outreach to departments and expand target audiences to include graduate students, post docs and faculty on other tracks.
- Continue mentoring efforts among junior faculty (including peer mentoring) and address mentoring issues for mid-career women separately.

Broader institutional policies:

- Provide research support for junior and senior faculty; increase support for internal collaborations; and extend pilot funding mechanisms to support women faculty careers.
- Family issues: ensure faculty are able to balance work and family lives, and also recognize that a focus on child care may add to sense of isolation for those who do not have children.
- Encourage diversity on important committees; employ consistent and appropriate criteria for evaluation and merit decisions, including extension of tenure clock.
- Ensure deserving faculty are recognized for teaching and/or service accomplishments; address sexism in teaching evaluations.
- Track career outcomes for women science and engineering graduate students and faculty and conduct periodic salary equity studies.

Differences in climate ratings between open-ended response theme groups

Some of the climate scales were also related to the themes in the open-ended measures. Those women who mentioned that there was an improvement in leadership rated the chair’s ability to create a positive environment and commitment to racial-ethnic diversity as significantly higher than those who did not mention such an improvement. And, as previously stated, women who mentioned increased attention to the issue as positive also rated the departmental gender dynamics significantly lower and the environment as less tolerant; they also tended to rate felt race/gender tokenism higher. These findings reinforce the need to focus attention where there are problems, but also to understand the potential negative consequences of this attention for women. Finally, women who mentioned the opportunities for networking as a positive outcome also rated felt race/gender tokenism and felt surveillance as significantly higher. They also rated

departmental gender dynamics lower. These results suggest that women who find their departments less welcoming benefit from opportunities to network with colleagues outside their departments. Table 3 summarizes findings for the positive themes.

Women who mentioned backlash and resistance in the open-ended question about negative changes also rated their department environments as significantly less positive and tolerant, the department gender dynamics significantly lower, and felt race/gender tokenism significantly higher. They also rated their chairs as less committed to racial-ethnic diversity. Women who mentioned that problems had continued with their department chair also rated their chairs as less fair and lower on creating a positive environment; they also tended to rate their chairs as less committed to diversity. These women also tended to rate the overall department climate as less positive. Finally, women who mentioned increased feelings of isolation since the beginning of ADVANCE also rated departments significantly higher on felt race/gender tokenism and felt surveillance; they also tended to rate the overall climate as less positive. One respondent reported, “I think the women in our department feel that they have been forced to take a position on diversity, and that this has had an overall negative effect on their morale and productivity. In a lot of ways I wish I still didn’t know how strongly my male colleagues feel about this.” Table 4 summarizes the finding for the negative themes.

Conclusions

The findings from these analyses suggest several conclusions about the impact of UM’s NSF ADVANCE project in terms of the departmental climate; these are summarized below. We note again that the coverage and discussion of the Summers remarks may have played some role, particularly in increasing women scientists’ awareness of their colleagues’ negative views, and their sense of being unwanted targets of negative attention.

- looking at both open and closed-ended responses, the data suggest that the campus climate has improved overall for instructional track women in science and engineering;
- the climate seems especially positive for new women faculty (although this result does not account for the previously mentioned change over time);
- however, ADVANCE’s attention on women scientists and engineers has resulted in some backlash and increased awareness of resistance on the part of some colleagues for the women;
- while not different on many items, women of color continue to experience more “felt surveillance” and “tokenism” than white women;
- generally there are no differences across school, although the Medical School faculty report some climate items as more positive now;
- job satisfaction continues to be highly correlated with the climate ratings.

Table 1: T-test Comparisons between 2001 Items and 2005 Items

	2001		2005		
	M	sd	M	sd	
Overall department climate^a:					
friendly (1) vs. hostile (5)	3.48	1.18	2.65	1.14	***
collegial (1) vs. contentious (5)	3.26	1.23	2.53	1.13	***
collaborative (1) vs. individualistic (5)	2.75	1.26	3.27	1.27	**
non-sexist (1) vs. sexist (5)	3.21	1.22	2.89	1.16	t
Gender dynamics:					
Some faculty have a condescending attitude toward women	3.11	1.37	3.55	1.20	*
Felt surveillance/tokenism:					
I constantly feel under scrutiny by my colleagues	2.56	1.19	3.11	1.32	**

^t $p \leq .10$ * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

^aEach adjective represents two ends of a continuum for rating on a 5 point scale. The first item listed represents a rating of 1 and the second item represents a rating of 5; thus a higher mean is closer to the second word in the continuum and a lower mean is closer to the first word (as listed in the above table).

Table 2: T-test Comparisons between Newly Hired and Continuing Women Faculty in 2005

	came before 2002		came in or after 2002		
	M	sd	M	sd	
Overall department climate^a:					
friendly (1) vs. hostile (5)	2.88	1.09	2.17	1.20	*
collegial (1) vs. contentious (5)	2.69	1.21	2.11	.90	*
non-sexist (1) vs. sexist (5)	3.10	1.16	2.56	.86	*
Gender dynamics:					
Men receive preferential treatment in the areas of recruitment and promotion	3.19	1.42	2.50	.92	*
Men are more likely to receive helpful career advice from colleagues	3.63	1.22	2.94	1.03	*
Sex discrimination is a big problem in our department	2.51	1.28	1.94	.80	*
There is equal access for both men and women to lab/research space	3.38	1.16	3.82	.73	t
In meetings, people pay must as much attention when women speak as when men do	2.51	1.26	3.17	1.29	t
Felt surveillance/tokenism:					
I have to work harder than I believe my colleagues do in order to be perceived as a legitimate scholar	3.57	1.37	2.76	1.15	*
My colleagues expect me to represent the point of view of my gender	3.27	1.41	2.59	1.12	t

^t $p \leq .10$ * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

^aEach adjective represents two ends of a continuum for rating on a 5 point scale. The first item listed represents a rating of 1 and the second item represents a rating of 5; thus a higher mean is closer to the second word in the continuum and a lower mean is closer to the first word (as listed in the above table).

Table 3: T-test Comparisons between Climate Ratings and Positive Themes

	Improved Leadership				Increased Attention				Networking Opportunities					
	yes		no		yes		no		yes		no			
	M	sd	M	sd	M	sd	M	sd	M	sd	M	sd		
Dept climate:														
gender dynamics					2.57	1.06	3.21	0.90	*	2.52	0.58	3.15	0.98	*
tolerant environment					2.95	1.00	3.50	0.77	*					
race/gender tokenism					3.47	1.45	2.74	1.20	^t	3.78	0.87	2.77	1.28	**
felt surveillance										3.83	0.60	3.21	1.08	*
Chair ratings:														
create pos. environment	3.67	0.63	3.17	1.08	*									
commitment to diversity	4.19	0.66	3.38	1.02	***									

^t $p \leq .10$ * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

Table 4: T-test Comparisons between Climate Ratings and Negative Themes

	Backlash/Resistance				Problems Continued				Increased Isolation						
	yes		no		yes		no		yes		no				
	M	sd	M	sd	M	sd	M	sd	M	sd	M	sd			
Dept climate:															
gender dynamics	2.36	0.63	3.17	0.96	**										
positive environment	2.56	0.89	3.28	0.98	*	2.28	0.98	3.27	0.96	^t	1.96	0.95	3.26	0.96	^t
tolerant environment	2.73	0.73	3.47	0.82	*										
race/gender tokenism	4.22	1.30	2.72	1.18	**						4.25	0.87	2.81	1.26	*
felt surveillance										4.44	0.72	3.22	1.04	*	
Chair ratings:															
chair is fair					2.00	0.91	3.39	0.96	*						
create pos. environment					1.93	0.76	3.38	0.96	**						
commitment to diversity	2.57	0.98	3.66	0.96	*	2.60	0.89	3.62	0.99	^t					

^t $p \leq .10$ * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

Network of Women Scientists and Engineers Climate Survey

Thank you very much for taking the time to complete this survey. We know how busy you are and have tried to make the survey as simple as possible. Please be assured that all survey responses are confidential and any reports generated from the survey will report aggregate data only.

To facilitate future planning, we hope to receive completed surveys no later than Monday, February 7, 2005. Please direct any questions or comments regarding the survey to Janet Malley, Director of Evaluation for UM ADVANCE, at jmalley@umich.edu.

Please return the completed survey to Keith Rainwater, Program Evaluation Manager for UM ADVANCE, at the Institute for Research on Women and Gender, 1136 Lane Hall 1290.

1. Please indicate your budgeted appointment(s) (i.e., more than 0% effort) for this academic year (2004 - 2005) at UM by selecting the School(s) or College(s) in which you hold the appointment(s). Check all that apply.

	Literature, Science and the Arts
	Engineering
	Medicine
	Nursing
	Public Health
	Dentistry
	Pharmacy
	Kinesiology
	Natural Resources
	Information
	Other (please specify): _____

2. Please indicate your unbudgeted/dry appointment(s) (i.e., 0% effort) for this academic year (2004 - 2005) at UM by selecting the School(s) or College(s) in which you hold the appointment(s). Check all that apply.

	Literature, Science and the Arts
	Engineering
	Medicine
	Nursing
	Public Health
	Dentistry
	Pharmacy
	Kinesiology
	Natural Resources
	Information
	Other (please specify): _____

3. Please indicate your rank for this academic year (2004 - 2005) at UM.

	full professor
	associate professor
	assistant professor

7. How would you rate your department/unit's executive leader (chair or director) in each of the following areas? If you have more than one department/unit affiliation, please rate the department/unit in which you spend the most time.

The chair/director of my department/unit...

poor	below average	average	above average	superior	
					maintains high academic standards.
					is open to constructive criticism.
					is an effective administrator.
					shows interest in faculty.
					encourages and empowers faculty.
					treats faculty in an even-handed way.
					helps me obtain resources I need.
					gives me useful feedback about my performance.
					articulates a clear vision.
					articulates clear criteria for promotion/tenure.
					honors agreements.
					handles disputes/problems effectively.
					communicates consistently with faculty.
					creates a cooperative and supportive environment.
					shows commitment to racial-ethnic diversity.

8. Please indicate your level of agreement with each of the following statements concerning the atmosphere in your department/unit. If you have more than one department/unit affiliation, please rate the department/unit in which you spend the most time.

strongly disagree	disagree	neutral	agree	strongly agree	
					Some faculty have a condescending attitude toward women.
					Sexist remarks are heard in the classroom.
					There is equal access for both men and women to lab/research space.
					The environment promotes adequate collegial opportunities for women.
					Men receive preferential treatment in the areas of recruitment and promotions.
					Men are more likely than women to receive helpful career advice from colleagues.
					In meetings, people pay just as much attention when women speak as when men do.
					Women are appropriately represented in senior positions.
					Sex discrimination is a big problem in my department.

9. Please indicate your racial/ethnic identification. (Select one)

	African American
	Asian American
	Euro American
	Latina or Hispanic American
	Native American/American
	Mixed or Other (please describe):

10. How long have you been at UM as a tenure-track faculty member?

	I came before Fall 2002.
	I came between Fall 2002 and now.

11. If you came before Fall 2002, please indicate when you came to UM.

	1960-64
	1965-69
	1970-74
	1975-79
	1980-84
	1985-89
	1990-94
	1995-2001

12. Please describe any positive changes in the climate in your department/unit as well as the University as a whole since Fall 2002.

13. Please describe any negative changes in the climate in your department/unit as well as the University as a whole since Fall 2002.

14. Can you suggest any new initiatives you think UM ADVANCE should begin that might be helpful in improving the climate?