SEEDS Climate Survey

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EXECUTIVE SUMMARY

Although the proportions of female faculty in STEM departments (Science, Technology, Engineering and Math) have clearly increased under the leadership of President Donna Shalala, the University of Miami (UM) still lags behind even the national average from 2006 (figure below). As of 2011, women are only a small fraction of STEM faculty at UM: Women compose only 17% of faculty in STEM departments, and only 34% in the social sciences. UM has the potential to create a more egalitarian institution that retains a diverse population of top researchers, but factors underlying low representation must be addressed before UM meets its full potential.

By assessing how men and women perceive their careers at UM, our SEEDS (Scientists and Engineers Expanding Diversity and Success) climate study identifies crucial components of faculty members’ career experiences and barriers that are particularly faced by women. This assessment will enable UM to implement evidence-based solutions toward the goal of developing a more academically supportive and egalitarian environment that is essential for success in a modern research university.

This report focuses on the experiences of select STEM and Social Science tenure track faculty at UM.

Assessment

Our climate survey satisfied three key requirements necessary for the assessment to be valid. First, the response rate was appropriate for internet-based surveys. Second, the sample size was large enough to support several meaningful conclusions. Third, the sample was representative of the target UM population. The distribution of respondents was in the same proportion as the population of the four colleges surveyed (percentages in figure at left) and in key variables (rank, time since Ph.D., age, and gender).

Thus, the survey well represents basic scientists from all four colleges: Arts and Sciences (A&S), Engineering (COE), Miller School of Medicine (MED) and the Rosenstiel School of Marine and Atmospheric Science (RSMAS), as well as A&S social science faculty.

Composite scales that consisted of multiple questions were used to measure the following concepts of interest: Career Satisfaction, Scholarly Isolation, Collegial Pressure, Departmental Influence, Perception of Chairperson, and Academic Climate. Scale composition and reliability measures are outlined in Appendix A. Each scale was tested and found to have high reliability, which helps ensure that findings can be transformed into policy changes that would be effective.
The climate survey was originally designed by researchers at the University of Michigan to assess not only gender but also racial/ethnic disparities. However, even though underrepresented minorities had high response rates, too few are employed as UM faculty to support a meaningful statistical analyses. Of particular note is the dearth of persons who identify as Black or Native American, especially in the STEM fields. The lack of sufficient numbers to study the experiences of racial/ethnic groups is an important finding in and of itself.

Results and Discussion

**Career Satisfaction** is significantly lower among STEM women that it is among STEM men. Women scientists report less satisfaction with their careers than do men. Nationally, career satisfaction is an important predictor of attrition among faculty, such that attrition is more frequent among women than men, both pre- and post-tenure. Women faculty are twice as likely to voluntarily depart before tenure review as are men. Of those who leave tenure-track positions prematurely, women are 40% more likely than men to move into adjunct positions, while men pursue (usually more lucrative) careers outside of academia. Women faculty across science disciplines cite workplace conditions much more frequently than men as their reasons for changing jobs. Career satisfaction can be affected by committee and service overload. Women in departments with a majority of men are often pressured to take-on heavier teaching and serve on service-oriented committees. This unbalanced workload leaves male faculty free to engage in more research, which is more highly rewarded and more important for promotion. Serving on numerous committees and in other service roles leads to conflicts in time management because service duties are seldom recognized or rewarded. Another component of career satisfaction is feeling valued and recognized by peers and by the institution. Based on the implications of the extensive foregoing literature, the lower career satisfaction found among STEM women is a key problem that very likely impacts the University’s ability to retain women scientists and engineers.

**Scholarly Isolation** is highest among STEM women. Scholarly isolation within an academic department includes lack of networks, lack of co-authorships, lack of access to informal and formal information about the department and advancement, and lack of senior mentors and relationships. Isolation has been linked to decreased productivity and has been shown to limit individuals’ access to formal and informal information, including both disciplinary and departmental news, that is necessary for career mobility. Isolation also increases the difficulty of attracting and retaining graduate students, and building meaningful collegial relationships in the home department. Isolation from colleagues reduces a professional’s sense of commitment to their institution, which can in turn increase attrition.

STEM Women reported experiencing more **Collegial Pressure** than did STEM Men. Collegial pressure includes feeling scrutinized, feeling the need to prove oneself constantly and being reluctant to speak up. Such pressure indicates a serious lack of social support from colleagues, which has been shown to significantly decrease job satisfaction. Faculty members who feel that they are overly scrutinized by higher-ranking colleagues have reduced job satisfaction. Interestingly, social science women report significantly lower experiences of collegial pressure than STEM women, exposing gendered issues that are particularly salient in STEM fields.

STEM women scored lowest in three important indices that assessed departmental dynamics. Interactions within a department are an integral issue for career satisfaction as faculty spend most of their time within their departments. **Influence over Decision Making** includes measures of how engaged faculty members were in important decisions about leadership, curriculum, and
selection of graduate students and incoming faculty members. Being involved in making decisions, contributing in meaningful ways to the future direction of the academic department, and having fair-minded people in official leadership positions all create a work environment that is both productive and satisfying. Faculty members value the opportunity to have input and influence in decisions, which increases their morale and satisfaction. Faculty members who have influence in departmental management have higher satisfaction than faculty members who feel silenced within their department. Women are often appointed to multiple superfluous committees but are restricted from serving on the committees that make the most important decisions, and when they do serve on such committees, they are seldom appointed to meaningful leadership roles. STEM Women report having the least amount of influence in departmental governance relative to all groups. The Ability of the Chair to Create a Positive Environment is an index that assesses perceptions of how effective departmental leadership is in creating a just environment, an issue that has been shown to be crucial to faculty career satisfaction. Among all groups, STEM Women ranked their chair lowest as the type of leader who was able to create a departmental environment conducive to building a productive and enjoyable workplace. STEM Women also had the lowest ranking of their departmental Chairperson as Fair as an effective, impartial leader. The low scores of all three departmental indices for STEM women identify negative departmental climate, and particularly departmental leadership, this is particularly unsupportive for STEM women.

Sexism and gender inequality are issues that produce a Gender Disparate Atmosphere, a negative work environment that is shared at UM by both STEM women and Social Science women. Sexist and unequal work environments have been repeatedly documented to decrease career satisfaction, especially among women. Nationally, the percentage of women faculty members who aspire to rise up the hierarchy of their department or university falls short of the percentage that represents women who actually are promoted. Implicit biases and seemingly gender neutral policies that actually negatively impact women are enacted throughout the promotion and evaluation process. Gender disparate atmosphere was evaluated by several questions pertaining to differential treatment of men and women, representation in senior positions, women in roles of authority, and experiences of gender discrimination. It is alarming that at UM, women from both STEM and Social Science departments report experiencing sexism and a generally unfavorable climate based on gender.

Two important conclusions are drawn from a comparison of groups on items comprising the composite scales (Attachment Figure 1) that used regression analyses to identify how different career elements impacted career satisfaction by field (STEM versus Social Science) and by gender. First, the greatest differences in satisfaction with career elements are not by field; they are closely related to gender. Multiple issues negatively impacted women, regardless of field. In addition, within the STEM field, multiple concerns impacted STEM women more than they did any other group, STEM men, or all faculty in the Social Sciences. While career satisfaction at the University of Miami is more closely related to gender than it is to the discipline in which a person works, issues in STEM fields are particularly inimical to the career satisfaction of women.

The second important finding is that multiple climate issues impacted ALL faculty members, regardless of field (Attachment Figure 1, lower right). Clearly, a positive departmental climate is crucial to the career satisfaction of men and women alike. Attention to the issues that impact these groups is clearly warranted.
Conclusions

Although the University of Miami has made progress in equality, the climate survey identifies current issues experienced by both STEM and Social Science women, and further shows that many of those issues that negatively impact women also impact men. A supportive, collegial and collaborative environment for all significantly enhances the career satisfaction of all faculty members, regardless of gender and regardless of field.

The survey revealed that STEM women are far less satisfied with their careers than are men. Scholarly isolation clearly has the most deleterious effect on career satisfaction. Moreover, isolation is highest among all women faculty, both in STEM and in the Social Sciences. In an era in which collaborative and interdisciplinary work is increasingly important to a career, the high levels of scholarly isolation reported are disturbing. Furthermore, women scientists and engineers report far less influence over departmental decisions compared to all other groups. Reduced influence for women creates an adverse departmental climate that in turn influences their perceived status in their department. Gender inequality that is perpetuated and deeply engrained in the everyday practices and experiences of the home department produce a highly gender disparate atmosphere and negative climate issues that are harmful to the career experiences and outcomes of all faculty.

The results of the climate survey rigorously identify issues that the faculty experiences, and can thus guide interventions at the departmental and institutional level, with a particular focus of creating a more egalitarian environment in STEM fields. Recommendations are below.
Recommendations

These recommendations identify remedies that other NSF ADVANCE programs have shown to be effective for issues identified in this climate survey. UM’s NSF ADVANCE entity is SEEDS, Scientists and Engineers Expanding Diversity and Success.

Climate

• Offer Department Chairs training that serves as professional development opportunity, beyond an orientation toward their legal responsibilities. Chair training is no longer mandatory at UM and often addresses only procedural deficits and legal sequelae, rather than department governance and climate. Training should also include effective leadership, effective mentorship, and recognizing and addressing implicit bias. Because departments are researchers’ intellectual home, department climate is disproportionately important and a pivotal role is played by the Chair, so that Chair training and development are crucial.
• Develop a cohesive effort at the level of deans and above to collect effective practices across colleges, assess their benefit to UM, and create transparent and enduring policies that address the issues identified here. Implement meetings among Deans and Chairs to share and disseminate best practices for climate improvement.
• Make Chairs accountable for diversity and climate in their departments. The Provost’s office should provide oversight and rewards for Deans and Chairs who enhance gender climate, increase underrepresented populations and support skills and mentorship programs.
• Monitor the gender and racial composition of speakers in major speaker series.
• Offer racial and gender awareness training and encourage participation.
• Expand the use of SEEDS Interactive Theater to foster discussions of gender and racial issues.

Recruitment

• Develop active recruitment programs, including target-of-opportunity programs and formal dual hire protocols at school and department levels to recruit women in STEM areas to faculty and leadership positions, and to recruit other underrepresented minorities to, at a minimum, reflect the applicant pool for each discipline.
• Train search committees in implicit bias and diversity issues.
• University-wide examination, dissemination, and adoption of best practices and policies for effective hiring.

Retention

• Establish an annual analysis of faculty cohorts to reveal both losses due to lack of promotion success and losses due to early failures of retention and seek to understand the issues affecting the likelihood of faculty success UM wide and among different units.
• Develop UM wide best practices in promotion and in recognizing implicit bias.
• Develop leadership training for women. For instance, in the Medical School, women who have gone through the ELAM program could be empowered to design and implement a leadership program.
• Develop meetings among women that combine community-building opportunities with effective goal-setting.
• Support career skills workshops and follow-up activities within schools and departments.
• Encourage grass-roots initiated engagement, e.g., through SEEDS You Choose awards that award $2500 for applicant-initiated activities that foster career satisfaction and success.
• Develop a culture of collegiality through recognition programs that reward individuals and programs designed to help faculty.

Sustain SEEDS and its programs

• Rosenstiel School’s Diversity Committee, Mentoring and Leadership program
• College of Engineering, Visiting Mentors Program
• Miller School of Medicine, Mentoring and Grantsmanship program
• College of Arts and Sciences, Facilitating Faculty Success program
• Schools are also targeted in SEEDS UM-wide programs including Networking events, Career Skills Workshops, Distinguished Visiting Scholars, Co-Mentoring by invited speakers, and Speed Mentoring.

Citations

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APPENDIX A

SCALE COMPOSITION AND RELIABILITY MEASURES

Scales constructed for analyzing results of the climate study were assessed to be valid and reliable. The components of each scale are listed, and each scale’s alpha score is reported\(^2\). By combining multiple measures into scales, concepts can be assessed more fully and in a more nuanced way, and then broken down into component parts to better understand particularly important individual questions as reported in Figure 1.

Scale items that have been reverse coded for analysis are indicated\(^3\). The wording in the survey questions were varied to ensure that respondents are not filling in answers without considering the questions. Some statements or questions were worded in an affirmative direction and others with negative wording. When analyzing the answers, some of the response categories must be reversed in their order so that the answers run in the same direction and items may be combined into a single concept.

In the scales, * designates statistically significant results. When a graph has multiple asterisks, the asterisks are color-coded, so that bars with like-colored asterisks differ significantly.

\(^2\)Validity ensures that the composite scale is measuring the concept that we intend to measure. Scale reliability is measured by Coefficient Alpha (\(\alpha\)), a score for internal consistency. Internal consistency is important for scales because it measures the degree to which the scale is reliable. The closer to one (1) the value of alpha is, the more consistent respondents’ answers are to similar items in the scale. Each of the scales achieved scores that are statistically significant, and therefore, reliable for measuring the issues included in the analysis.

\(^3\)Reverse coding refers to “flipping” the response categories of a survey question so the answers are in the same direction and thus, having an index or a series of questions that can be interpreted similarly. A simplified example is the difference between two ways of asking a “Do you agree with the statement?” versus “Do you disagree with the statement?” Clearly the answers may be reversed and have the same meaning as long as the interpretation is consistent.
I. CAREER SATISFACTION SCALE $\alpha = .81$

- Opportunities to collaborate with other faculty
- Amount of social interaction with members of department
- Level of research funding
- Sense of being valued for my research/creativity by members of department
- Level of intellectual stimulation in day to day contact with faculty colleagues

II. SCHOLARLY ISOLATION SCALE $\alpha = .84$

- I am comfortable asking questions about my performance expectations (Reversed)
- My colleagues solicit my opinions about their research ideas and problems (Reversed)
- My research interests are valued by my colleagues (Reversed)
- I feel pressured to change my research agenda in order to fit in
- I feel pressured to change my research agenda to make tenure/be promoted

III. COLLEGIAL PRESSURE SCALE $\alpha = .85$

- I am/was reluctant to bring up issues that concern me for fear that it will/would affect my promotion/tenure.
- I constantly feel under scrutiny by my colleagues.
- I have/had to work harder than I believe my colleagues do, in order to be/have been perceived as a legitimate scholar.
- There are many unwritten rules concerning how one is expected to interact with unit colleagues.
IV. INFLUENCE OVER DECISION MAKING $\alpha = .83$

- unit curriculum decisions
- selecting new graduate students or residents/fellows
- selecting new faculty members to be hired
- determining who gets tenure
- selecting the next unit head

V. INFLUENCE OVER UNIT RESOURCES $\alpha = .73$

- size of salary increases I receive
- obtaining money for travel to professional meetings (beyond standard unit allocations)
- securing the facilities or equipment I need for my research

VI. CHAIR AS FAIR $\alpha = .92$

- treats faculty in an even-handed way
- honors agreements
- handles disputes/problems effectively
VII. PERCEPTION OF CHAIRPERSON \(\alpha = .91\)

- is an effective administrator
- encourages and empowers faculty
- creates a cooperative and supportive environment

![Bar chart showing perception of chairperson across different groups]

VIII. GENDER DISPARATE ATMOSPHERE SCALE \(\alpha = .88\)

- Some faculty have a condescending attitude toward women. (R)
- Sexist remarks are heard in the classroom. (R)
- 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. (R)
- Men are more likely than women to receive helpful career advice from colleagues. (R)
- 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. (R)

![Bar chart showing gender disparate atmosphere across different groups]
IX. GENDER STEREOTYPING $\alpha = .82$

Insensitive or disparaging comments…
- about women in general or about particular women as “typical” of women made by faculty
- about women in general or about particular women as “typical” of women made by students
- about men in general or about particular men as “typical” of men made by faculty
- about men in general or about particular men as “typical” of men made by students

X. ETHNIC/RELIGIOUS STEREOTYPING SCALE $\alpha = .80$

Insensitive or disparaging comments about…
- racial/ethnic minorities, or about particular persons of color as “typical” made by faculty
- racial/ethnic minorities, or about particular persons of color as “typical” made by students
- a religious group or about particular persons as “typical” made by faculty
- a religious group or about particular persons as “typical” made by students

XI. TOLERANT ENVIRONMENT $\alpha = .61$

- Racist/ Non-racist
- Homophobic/ Non-homophobic
- Homogeneous/ Diverse
- Sexist/ Non-sexist
XII. POSITIVE ENVIRONMENT $\alpha = .92$

- Hostile/ Friendly
- Disrespectful/ Respectful
- Contentious/ Collegial
- Individualistic/ Collaborative
- Competitive/ Cooperative
- Not supportive/ Supportive

![Positive Environment Chart]

XIII. TOKENISM: $\alpha = .80$

- My colleagues expect me to represent “the point of view” of my gender.
- My colleagues expect me to represent “the point of view” of my race/ethnicity.

![Tokenism Chart]