

## Good Places to Do Science: Improving Diversity, Equity and Inclusion in Academic S&E Departments

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## Organizational Climate

Patterns of interactions and behaviors among  
group members

Schein, 1992

The shared assumptions, norms, practices,  
processes, structure, physical space layout,  
stories, and formal statements employed by group  
members

O'Reilly, 1996

An organization's climate is reflected in its structures,  
policies, and practices; the demographics of its  
membership; the attitudes and values of its members  
and leaders; and the quality of personal interactions

(UW-Madison, 2002).

## Linking Departmental Climate and the Advancement of Science


"You know, I think the environment is really important throughout one's entire career, especially these days where it takes many different methodologies to complete a research project. For example, there are certain methodologies that I don't know how to do, but my research would benefit from it. If I'm in an environment where that methodology is not available, I'm out of luck. But if I have a strong environment that's relevant to my research, I may be able to go down the hall and ask someone to help me interpret data or help me to use a method that I don't know how to use, to help advance my research."

- Male Associate Professor

## What is Gender Equity and Inclusion?

- A social order in which women and men share the same opportunities and the same constraints on full participation in the economic and domestic realms (Bailyn, 2006)
- Parity in the quality of life and the work outcomes valued by society between males and females (Koch & Irby, 2002)
- The degree to which women are accepted and treated as insiders by others in the work system (Pelled Ledford & Mohrman, 1999)
- How women are successfully integrated to enable their effective performance, professional development, and advancement (Zelechowski & Bilimoria, 2003)
- An individual's sense of being a part of the formal and informal processes of the organizational system (Mor Barak, 2000)

## Moving from Compliance to Inclusion

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- **Compliance** Conformity in fulfilling federal, state or local government requirements, AA, EEOC
  - **Diversity** Increasing the representation of diverse groups
  - **Equity** Removing the barriers to organizational competition, thus allowing people who are “different” to compete equitably.
  - **Inclusion** Leveraging the unique backgrounds and experience of all employees to achieve organizational goals and objectives. In an inclusive organization, employees’ skills and talents are recognized, used effectively, valued, and help drive organizational success

Modified from The Minority Corporate Counsel Association’s Creating Pathways to Diversity, 2006

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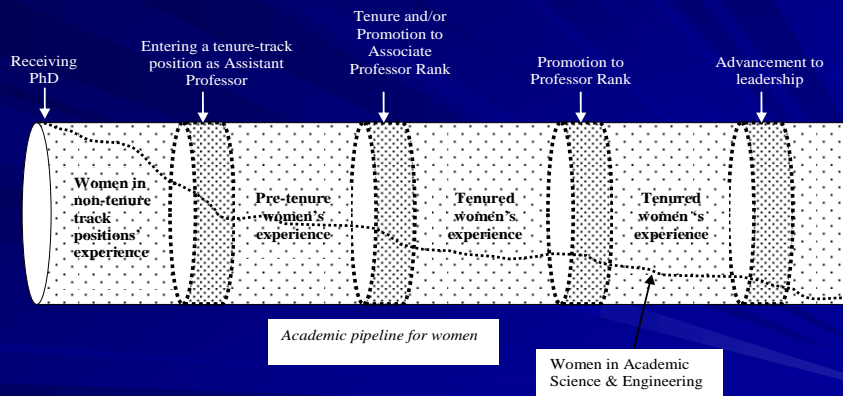
## Why Focus on Gender Equity and Inclusion in Academic S&E?

- Systematic, historical, and widespread inequities in women’s representation and inclusion persist at every stage of the S&E academic pipeline: entry, tenure, promotion, and leadership, having detrimental implications for the future of the U.S. scientific workforce
- Women’s under-representation and lack of inclusion at all faculty ranks and in leadership is a lost opportunity for U.S. academic S&E to compete globally

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## The Leaky Pipeline of Women's Representation in Academic S&E



Adapted from Mason et al, 2005

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## Equity and Inclusion Issues of Women Faculty in Academic S&E

### Women in Non-Tenure Track Positions:

- May rarely be provided opportunities for professional advancement
- May not have their performance regularly reviewed or rewarded
- May rarely find their positions converted to full-time or tenure track and rarely receive priority consideration when they are
- May be shut out of the faculty governance processes by the institutions that appoint them (AAUP, 1996)

### Women in Tenure Track Positions:

- May experience isolation, have fewer role models and mentors and have to work harder than their male colleagues to gain credibility and respect (e.g., Liang & Bilimoria, 2007; Rosser, 2004)
- Report lower satisfaction with their academic jobs than do male faculty (e.g., Bilimoria et al., 2006; Callister, 2006)
- Have lower compensation and fewer leadership responsibilities than men faculty (e.g., NSF, 2004)

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## Characteristics of Environments That Enable Gender Equity and Inclusion

- A critical mass of women at all levels and in leadership
- Freedom from stereotyping about women's and men's roles and occupations
- Work conditions (e.g., job titles, work schedules, policies, physical environment) that include and value both men and women
- Opportunities for reward and advancement based on qualifications, performance and talent, not gender
- Work structures and cultural norms that support positive relations between men and women
- Work policies and structures that support work-life integration

Modified from McLean, D. (2003)

## Gender Equity Perceptions Differ by Gender



Advance Survey, N=816; Includes combined responses of strongly agree and somewhat agree; \*Items significantly different by gender,  $p \leq .05$

Source: Virginia Tech 2005 *AdvanceVT* Faculty Work-Life Survey and Faculty Exit Survey

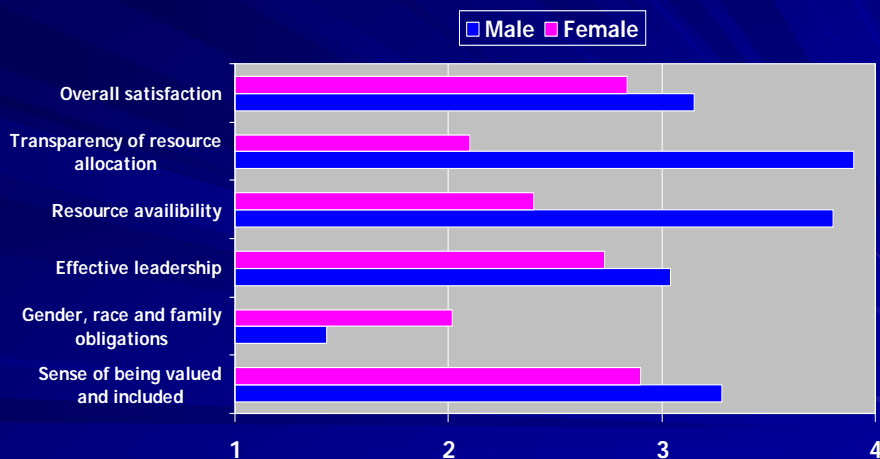
# Types of Departmental Climates

- Instrumental Department Climate:
  - The vast majority of science and engineering departments
  - Highly competitive and hierarchical
  - Often reflect “negative attitudes towards women in science” (Etzkowitz, Kemelgor & Uzzi, 2000)
  - “This university is a techie, male-dominated, male-oriented, “medical” kind of place” (CWRU Junior Women Faculty Focus Group)
- Relational Department Climate:
  - “Collegial and cooperative atmosphere that provides the safety to take the risks necessary for innovative work and the collaborations necessary for networking” (Etzkowitz, Kemelgor & Uzzi, 2000)
  - Are particularly attractive to women faculty (who may have struggled for recognition and status as students and postdocs in instrumental climates)
  - Women in more cooperative and collegial departments felt more engaged in their work, connected to their peers, and better able to develop their professional potential (Rosser, 1999)

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# Climate Perceptions Differ among Male and Female Faculty



Source: CWRU 2004 Climate Survey

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# Research Study

## Purpose

To identify work environment characteristics that facilitate high quality science and gender diversity, equity and inclusion

# Case Study Site

- "Science" Department
- Top program and NIH funding rankings
- 2 women chairs, different operating styles
- Above average numbers of women faculty and students
- Women faculty at all ranks

# Methods

## Case Study Approach using:

- Document & archival research
- Direct observation
- 29 interviews of departmental members
  - **16 primary faculty**
  - **4 secondary, active faculty**
  - **3 staff**
  - **6 post-docs and doctoral students**

## Findings – (1) Inclusive Scientific Identity

### Values

- “Good Science” (significant, trustworthy)
- Doing science cooperatively (vs. competitively)

### Beliefs

- Interaction is part of doing good science
- Anyone can do good science if they can learn quickly, are well-trained (developed), are excited about science and willing to work hard



## Findings – (2) Participative Departmental Activities

- Team teaching with participation across faculty ranks
- A variety of department social events (different contexts, time of day, informal)
- Participative faculty meetings
- Regular meaningful seminars and presentations

## Findings – (3) Constructive Interactions

### Four Types of Constructive Interactions

- Collegial Interactions: respectful, civil
- Tacit Learning Interactions: information sharing, modeling behaviors
- Relational Interactions: personal interest, caring
- Generative Interactions: problem solving and resource generating

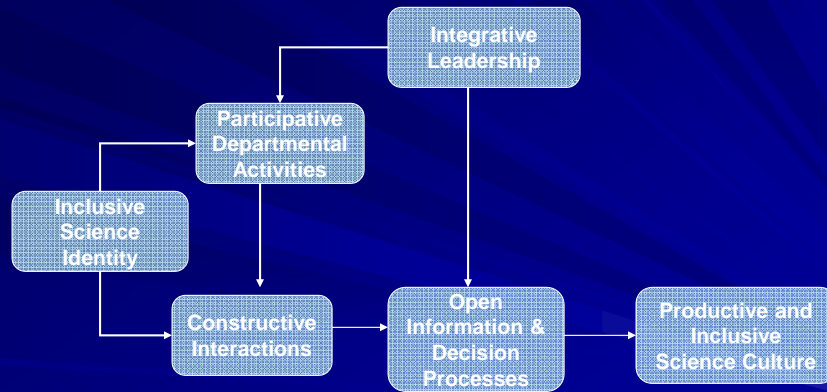
## Findings – (4) Integrative Leadership Practices

- Treating everyone fairly and equitability
- Seeking input from faculty in decision-making
- Promoting meaningful opportunities for interaction
- Performing the role of chair as a service to the scientific community of the department

## Findings – (5) Open Information & Decision Processes

- Transparent decision-making
- Open and inclusive faculty recruitment processes
- Formal and informal information dissemination processes

## Findings - A Model of a Productive and Inclusive Science Culture



Full report available at:

[http://www.case.edu/admin/aces/documents/science\\_department.doc](http://www.case.edu/admin/aces/documents/science_department.doc)

## Conclusions from the Study

- Creating an top-quality, inclusive, science culture within a department requires attention to a set of factors – values and beliefs, interactions, activities, leadership, processes.
- A key advantage of such a culture is its attractiveness to a wider range of scientists, both female and male, which has implications for recruiting and retaining faculty, post-docs, and students.
- Leadership by the chair is a critical catalyst of an inclusive departmental culture

## The Department Chair Influences Six Key Factors of the Work Environment

- Clarity – about mission and values
- Commitment – to a common purpose
- Flexibility – to adapt and innovate unencumbered by red tape
- Responsibility – to share in the necessary tasks
- Standards – levels that people set and aspire to
- Rewards – appropriate and aligned with feedback

Source: "Leadership That Gets Results", Daniel Goleman, [Harvard Business Review](#), March-April 2000

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## A Key Role of Department Chairs Influencing Departmental Climate

Creating Effective Mentoring  
Systems for Pre-tenure Faculty  
and Associate Professors

## A Spectrum of University Best Practice Approaches to Mentoring

### Formal

- All junior faculty are formally paired with a mentor
- Selected senior faculty are selected and specifically trained in mentorship
- School-wide mentorship kick-off dinner to start the relationship
- Bi-annual mentorship gatherings for discussion of career progress
- Quarterly workshops on career development, grant writing, achieving tenure,
- Protégés receive annual written feedback from mentors

### Informal

- Chairs meet with junior faculty and new faculty to discuss their learning needs
- Chairs then discuss potential appropriate mentors, and facilitate appropriate connection
- Mentors and protégés work out the details of their relationship



## Selected Best Practices of Faculty Mentoring

- U Michigan CAS –
  - Dept. chair and new faculty member develop a mentoring plan addressing teaching, graduate supervision, and research
  - Chairs fill out a section on mentoring in their annual reports.
  - Annual college-level meeting open to all tenure-track faculty to discuss the requirements for tenure and promotion and the P&T process
- U Penn –
  - Each school designates a senior faculty person responsible for the management of the faculty mentorship program
  - Specific responsibilities and expectations of the mentor are clearly stated in the school's policy and distributed to the junior faculty member along with the school's promotion guidelines
  - Faculty mentoring considered as one of the university citizenship criteria for promoting senior faculty from Associate Professor to Full Professor
- Stanford Medical School –
  - Mentor assigned as soon as faculty member is hired; others may be added later by the faculty; mentors meet every six months with mentees

## Formats of Mentoring

- One-on-one mentoring
- Committee mentoring
- Peer group: seminars, panel discussions
- Academic performance and career development workshops
- Zone mentoring (by area of expertise)
- E-mentoring
- Travel support to meet disciplinary mentor outside the university
- Annual review meetings with chair and mentors

## "How" We Mentor Affects Career Outcomes

### Women mentees:

- Were mentored mostly about:
  - Psycho-social support (understanding themselves and the ways they operate, navigating politics, and work-life issues)
  - Developmental advice (guidance about ways to change themselves) and extra work assignments including extra travel and meetings
- Had mentors with lower clout, after controlling for lower post-MBA starting position

### Men mentees:

- Were mentored mostly about:
  - Career functions (planning next moves, how to take charge in next roles, and figuring out how to achieve career goals)
- Received active sponsorship by the mentor (advocacy, resources, visibility, opportunities, network connections)
- Had mentors with higher clout

Similar numbers of lateral moves (same-level job assignments in different functions, designed to give high potentials exposure to various parts of the business). But men were receiving promotions after the lateral moves; for women, the moves were offered in lieu of advancement.

# Mentoring Challenges

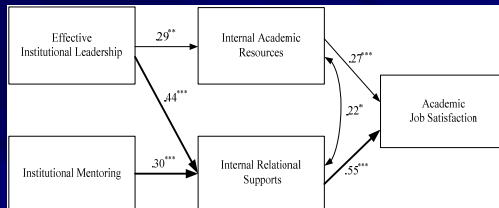
- Department size: Sometimes not enough senior faculty mentors to go around
- Time challenges: the best mentors are very busy; and mentees don't perceive their time investment to be worthwhile
- Culture: Junior women faculty don't want to "impose" on senior faculty
- Perceptions and expectations of mentoring differ between senior and junior faculty
- Associate to full professor mentoring sometimes falls through the cracks
- Departments are left to manage on their own; few school- or university- level resources and supports for mentoring
- Others ...

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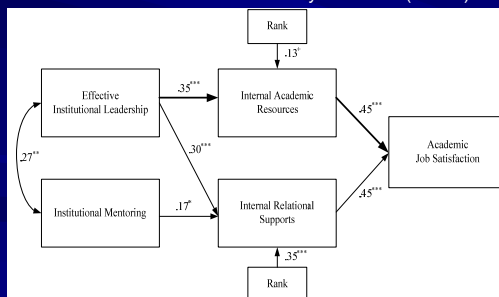
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## A Study of Academic Job Satisfaction at CWRU

Path Coefficients for Female Faculty Members (n=100)



Path Coefficients for Male Faculty Members (n=148)



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### Selected Findings

- Female faculty perceive that institutional leadership is more strongly related to providing internal relational supports than academic resources. Male faculty perceive that institutional leadership is more strongly related to providing academic resources.
- The path from institutional mentoring to relational supports was significant for both men and women, but the strength of the relationship was almost double for women.
- While job satisfaction for male faculty arises equally from academic resources and relational supports, job satisfaction for female faculty derives twice as much from internal relational supports

Source: Bilimoria, Perry, Liang, Stoller, Higgins, & Taylor (2006). *Journal of Technology Transfer*, 32, 3: 355-365.

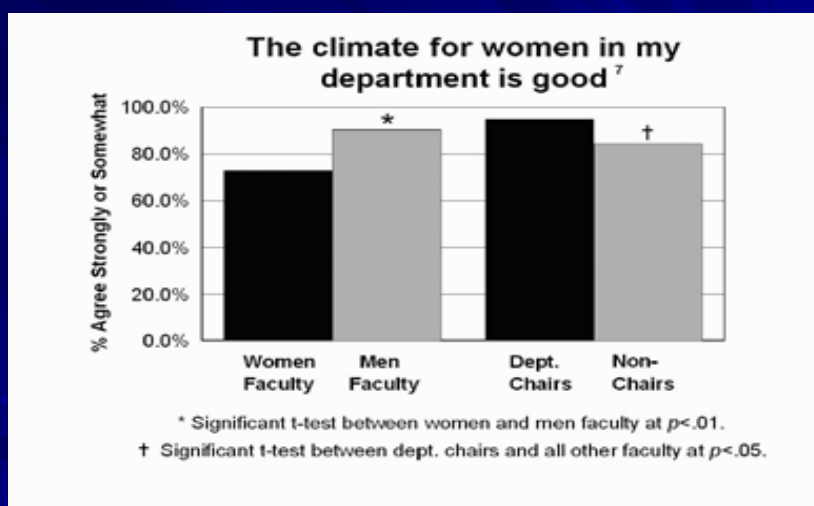
## Some Conclusions about Best Practices in Faculty Mentoring

- Research has shown that structured mentoring efforts, where senior faculty members are assigned to pre-tenure faculty and there are established guidelines and expectations, are most effective.
- Support mentors in performing both career and psycho-social functions of mentorship; train women faculty to seek career support, and ensure minority and women faculty, in particular, receive sponsorship.
- Discuss mentoring in departmental meetings.
- To maximize the effectiveness of informal faculty mentoring, department chairs check in with mentors and mentees at least once a semester.
- To combat some of dept. size challenges, utilize an array of department-level mentoring practices: one-on-one; committee; peer group seminars, workshops and panel discussions; zone; e-mentoring, annual review sessions with chair and mentors.
- Create annual school/college forums for discussion of requirements and process for tenure and promotion (for pre-tenure faculty and associate professors).

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## Get Information from Others About Department Climate



Source: WISELI: [Enhancing Departmental Climate](#)

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# Implications for Chairs Seeking to Improve Departmental Climate

1. Initiate meaningful ways to make the department a scientific community
  - Encourage constructive interactions; enforce zero tolerance for bad behavior
  - Engage faculty in a variety of participative activities
2. Establish effective faculty mentoring systems
  - Pre-tenure faculty mentoring and sponsorship
  - Associate professor development
3. Use the role of chair in service to the department
  - Check own assumptions about who a “good” scientist is and what a “good” scientist does
  - Increase the transparency of your decisions
  - Create regular forums so that you can hear the experience of faculty, especially women, minority, and junior faculty
  - Relate to faculty fairly and equitably