LEADER CONSORTIUM

Launching Equity in the Academy across the Dayton Entrepreneurial Region

NSF ADVANCE PROGRAM

LEADER Consortium (Air Force Institute of Technology, Central State University, University of Dayton, Wright State University)

Faculty Work Climate Survey (Baseline)

Final Report

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Contents

Tables

Figures

Acknowledgments

Final Report Authors

This report was prepared by Tamera Schneider, PhD, associate professor of psychology, and Rebecca Riffle, graduate research assistant, at Wright State University. They were assisted at various stages of the report by students from various LEADER institutions and staff.

Survey Development, Data Entry, and Analysis

Sarah M. Moore	Graduate Research Assistant, Department of Psychology, UD
Emily Polander	Graduate Research Assistant, Department of Psychology, WSU
Rebecca Riffle	Graduate Research Assistant, Department of Psychology, WSU
Peggy DesAutels, PhD	Associate Professor, Department of Philosophy, UD
Tamera Schneider, PhD	Associate Professor, Department of Psychology, WSU

There were 3 non-structured individual interviews with tenured faculty at each institution to ensure that any issues about organizational climate would surface and be added to the climate survey. As such, the climate survey we created was based on formative evaluation. In addition, we perused various climate surveys from prior ADVANCE projects and adapted some of their items to be included in our climate survey.

Faculty Participation Information (e.g., name, discipline)

Deanna Vinson	Research Program Assistant, AFIT
Pamela Jackson	Human Resources, CSU
Susan Wachtel	Office of Sponsored Programs, CSU
Candace Lowell	Equity Advisor, CSU
Kimberly Kendricks, PhD	Co-Principal Investigator, CSU
Linda Nianouris	Human Resources, UD
Joyce Carter	Human Resources, UD
Tony Whack	Human Resources, WSU
Susan McGovern	Program Director, LEADER, WSU
Emily Polander	Graduate Research Assistant, Department of Psychology, WSU
Tamera Schneider, PhD	Associate Professor, Department of Psychology, WSU

Human-subjects approval was sought from each participating institution and obtained for both the qualitative research and the quantitative survey research.

Introduction

Women in STEM Fields

The underrepresentation of women in STEM academic positions is a nationwide concern (National Academy of Sciences (NAS), National Academy of Engineering (NAE), & Institute of Medicine of the National Academies (IMNA), 2007). This underrepresentation is evident in gender disparities both in the training required for academic careers (e.g., graduate school and postdoctoral fellowships) and in hiring, promotion, retention, and advancement in academic organizations. For women scientists and engineers in the academy, these problems persist partly because of features of the institutional climate that are rooted in unconscious (i.e., implicit) and conscious (i.e., explicit) biases, attitudes, and behaviors of individuals within these organizations. These biases, which disproportionately disadvantage women, are held by both men and women. The disadvantages associated with biases of this type accumulate over time and can significantly hinder the success of women who choose to enter STEM fields.

Stereotypes can prevent women from entering STEM fields in the first place. NAS et al. (2007) has identified commonly held stereotypes about women in STEM fields: (1) women are not as good in mathematics as men, (2) women are not as competitive as men and do not want jobs in academia, (3) women faculty are less productive than men, and (4) women are more interested in family than in careers. The belief that men are more inclined to participate in and excel in math and science is widely held, even among women (NAS et al., 2007; Nosek, Banaji, & Greenwald, 2002). Stereotypes are beliefs that are involuntary, and they can influence attitudes and behaviors. The transformation of climate is thus fundamental to achieving ADVANCE objectives. With three rounds of ADVANCE sites now funded by the National Science Foundation, "best practices" are becoming available to the STEM community. That is what the LEADER consortium hopes to do – to borrow best practices from past ADVANCE sites and from each of the four institutions within the LEADER consortium to enhance the recruitment, advancement, and success of STEM women faculty.

Regional Climate Study

The cultural norms and institutional policies across the partner institutions are as diverse as their histories and demographics. Our goal is to develop a regional climate and culture that enhances the recruitment, advancement, and success of STEM women. A collaborative approach to understanding and enhancing the environment for STEM women in the academy provides fruitful grounds both for evaluating best practices and for creating a sustainable, progressive regional environment. The LEADER specific aims are:

1. To conduct a comparative analysis of climate for STEM women across the institutions and thereby identify best practices related to recruitment, retention, and advancement.
2. To initiate gender schema education and a campaign based on persuasion theory that will promote new norms of expectation and thereby facilitate implementation of those best practices.

3. To implement social contracts across the consortium to promote transparency and accountability for the transformation of the climate leading to recruitment, promotion, and success of STEM women regionally.

Method

Respondents

STEM and Social Science tenure-track faculty (N = 574) from four institutions (AFIT, CSU, UD, WSU) were invited to participate in an online survey (see Appendix A for a breakdown of STEM and Social Science designations). An IRB-approved email was crafted for Deans of Colleges of respective institutions to adapt and send to their faculty to request participation. The email included a link to the online survey (programmed in and responded to using SNAP software). Those affiliated with LEADER (i.e., leadership) were not included in the email list sent to deans, and were not invited to participate in the online survey. The overall response rate was 49% (N = 282). Respondents who provided survey data about their workplace climate were retained for the present summary, which yielded a response rate of 44% (N = 252). Of these, 60% (n = 152) were men and 25% (n = 62) were women.

Procedure

This first consortium climate survey was conducted by offering participation to each tenure-track faculty member at each institution. A similar version of the climate survey is to be distributed to tenure-track faculty at the end of the fifth year of the LEADER project to assess general changes in climate over the course of the project. Faculty contact information was obtained from human resources departments, institutional representatives, deans, and equity advisors. The dean for each college at each institution sent an email invitation with a link to the online survey to their tenure-track faculty. To facilitate the deans' emails, we provided them with a list of emails for the tenure-track faculty in their college and wording for their invitation email. The invitation email informed faculty that the confidential and anonymous survey would take approximately 15-20 minutes, and that participants would be entered into a raffle for a $100 gift card (AFIT faculty were excluded from the raffle due to restrictions against incentive-driven research participation during duty hours). (The three lottery winners were notified and confirmed receipt of their gift cards).

Two weeks after the initial invitation, we sent out response postcards via both email and U.S. post office reminders to all participants to query participation. Options included that faculty a) participated in the online survey, b) did not participate, but planned to, or c) did not plan to participate. We sent out six subsequent email invitations (which included the query and the survey link) to faculty members who either did not respond to the reminder or responded that they had not yet participated in the climate survey but planned to. We recorded all reminder responses in a database consisting of faculty names, contact information, and their response to the follow-up. Our follow-up was modeled somewhat after University of Michigan's 2002 study

design (Stewart, Stubbs, & Malley, 2002). Looking to have the same successes as University of Michigan's climate survey, we expected response rates of at least 38% from each institution. However, subsequent to setting this goal, it was learned at an ADVANCE PI meeting that a 50% response rate is preferable, resulting in the six follow-up invitations, the last sent in February, 2010. Table 1 presents the response rate for each institution, showing that the larger institutions appeared to have lower response rates. Table 2 presents response rates for STEM faculty, showing generally the same pattern – larger institutions appeared to have lower response rates.

Table 1. *Overall Response Rates, by Institution*

College	Total per institution	Number of responses	Response rate	Percent of total responses
AFIT	81	40	49.4%	14.1%
CSU	39	23	59.0%	6.8%
UD	200	77	38.5%	34.8%
WSU	254	112	44.1%	44.3%
TOTAL	574	252	43.9%	100%

Table 2. *Response Rates for STEM faculty, by Institution*

College	Total per institution	Number of responses	Response rate	Percent of total responses
AFIT	79	38	48.1%	21.0%
CSU	21	15	71.4%	8.3%
UD	139	55	39.6%	30.4%
WSU	176	73	41.5%	40.3%
TOTAL	415	181	43.6%	100%

Table 3 presents a summary of respondents, by institution, discipline, and sex[1]. There are numerous STEM disciplines with fewer than three tenure-track faculty respondents represented (e.g., Physical Science). An a priori requirement for a cell size of three or more individuals was made for disaggregation of data to ensure anonymity of responders. Consequently, we collapsed across discipline to create two major groupings at the college level: Engineering and Computer Science (ECS) and Science and Mathematics (SM). (Note: This is not a clear way to combine data for each institution in the consortium. For example, computer science would best fit with

[1] Summaries for each institution were presented individually to institutional representatives. To ensure adequate cell population, data were summarized by sex (women, men) and college (ECS, SM) for two institutions (UD, WSU) and summarized by sex for two institutions (AFIT, CSU). For further information about a particular institution, contact the institutional representative. Some data may not be made public.

science and mathematics at CSU. We combined ECS and SM across each institution to be able to disaggregate data in a meaningful way across the consortium institutions).

Table 3*. Number (%) of Tenure-track Faculty Respondents at each Consortium Institution, by NSF STEM Field and Sex*

	Institution			
	AFIT	CSU	UD	WSU
Engineering (n=75)	**24 (32.0)**	**5 (6.7)**	**28 (37.3)**	**18 (24.0)**
Men (n=53)	19 (95.0)	5 (100.0)	16 (72.7)	13 (81.3)
Women (n=10)	1 (5.0)	0	6 (27.3)	3 (18.8)
Physical Science (n=22)	**5 (22.7)**	**4 (18.2)**	**6 (27.3)**	**7 (31.8)**
Men (n=15)	3 (75.0)	2 (66.7)	6 (100.0)	4 (66.7)
Women (n=4)	1 (25.0)	1 (33.3)	0	2 (33.3)
Earth, Atmosphere, and Ocean Sciences (n=7)	**0***	**1 (14.3)**	**2 (28.6)**	**4 (57.1)**
Men (n=3)	0	0	0	3 (75.0)
Women (n=4)	0	1 (100.0)	2 (100.0)	1 (25.0)
Mathematics (n=28)	**4 (14.3)**	**2 (7.1)**	**12 (42.9)**	**10 (35.7)**
Men (n=12)	2 (50.0)	2 (100.0)	6 (60.0)	3 (60.0)
Women (n=7)	1 (50.0)	0	4 (40.0)	2 (40.0)
Comp Science (n=14)	**4 (28.6)**	**1 (7.1)**	**1 (7.1)**	**8 (57.1)**
Men (n=12)	2 (100.0)	1 (100.0)	1 (100.0)	8 (100.0)
Women (n=0)	0	0	0	0
Bio/Agricultural Science (n=35)	**1 (4.0)**	**2 (5.7)**	**6 (17.1)**	**26 (74.3)**
Men (n=23)	1 (100.0)	0	3 (75.0)	19 (70.0)
Women (n=8)	0	1 (100.0)	1 (25.0)	6 (30.0)
Social Science (n=54)	**0***	**3 (5.6)**	**20 (37.0)**	**31 (57.4)**
Men (n=24)	0	0	9 (52.9)	15 (53.6)
Women (n=24)	0	3 (100.0)	8 (47.1)	13 (46.4)
Non-Science and Engineering (n=7)	**0**	**1 (14.3)**	**1 (14.3)**	**5 (71.4)**
Men (n=5)	0	1 (100.0)	1 (100.0)	3 (75.0)
Women (n=1)	0	0	0	1 (25.0)
Professional (n=9)	**2 (22.2)**	**4 (44.4)**	**1 (11.1)**	**2 (22.2)**
Men (n=4)	1 (50.0)	1 (33.3)	1 (100.0)	1 (100.0)
Women (n=3)	1 (50.0)	2 (66.7)	0	0
Total (N=252)	**40 (15.9)**	**23 (9.1)**	**77 (30.6)**	**112 (44.4)**

Note. *department does not exist at the institution.

Table 4 presents a summary of the frequency distribution of the 148 STEM faculty respondents for whom we also have information about their college, rank, and sex. There were zero women full professors in ECS across the consortium. Consequently, subsequent analyses

collapsed across rank to create two groups: assistant versus tenured (i.e., associate and full professors combined). Data analysis was facilitated using Excel and SPSS software packages. Psychometric analysis was used to reduce the data and is described below.

Table 4. *Number (%) of Men and Women STEM Tenure-track Faculty Respondents by College and Rank.*

	Men	Women	Total
ECS Total	**64 (43.2)**	**9 (6.1)**	**73 (49.3)**
Assistant Professor	12 (8.1)	6 (4.1)	18 (12.2)
Associate Professor	23 (15.5)	3 (2.0)	26 (17.6)
Full Professor	29 (19.6)	0 (0.0)	29 (19.6)
SM Total	**52 (35.1)**	**23 (15.5)**	**75 (50.7)**
Assistant Professor	13 (8.8)	9 (6.1)	22 (14.9)
Associate Professor	18 (12.2)	8 (5.4)	26 (17.6)
Full Professor	21 (14.2)	6 (4.1)	27 (18.2)
Total	**116 (78.4)**	**32 (21.6)**	**148 (100.0)**

Note. ECS=Engineering and Computer Science, SM=Science and Mathematics.

Exploratory Factor Analysis. First, items where high ratings denoted a negative workplace climate were reverse-scored so that higher values denote a positive climate. That is, some items were worded on the survey such that when respondents strongly agreed with them it denoted a negative climate (e.g., "I do not feel attached to this university."). These items were reverse-scored so that higher scores would denote a better workplace climate (e.g., a person strongly agreeing with the aforementioned item would have a lower score for the item, denoting low agreement with feeling attached to the university). After reverse-scoring the appropriate items, higher ratings across the survey items denote a more positive workplace climate.

Second, exploratory factor analyses were computed to investigate whether items covaried, or created a factor. Specifically, principal axis factor analyses were computed with Varimax rotation. Psychometric guidelines were used to ascertain the number of factors to retain (Eigenvalues > 1 and visual inspection of scree plots) and whether to retain an item within a factor (loading > .40 on the factor to which it contributes, and < .40 on any other factor). All items representing a factor were averaged to create a subscale score for that factor. Reliability was determined by calculating Cronbach's alpha with subscales containing three or more items, or by calculating Pearson's Product Moment Correlations for subscales with two items. All subscales reported below had acceptable reliability (Cronbach's alpha > .70, or Pearson's r > .40).

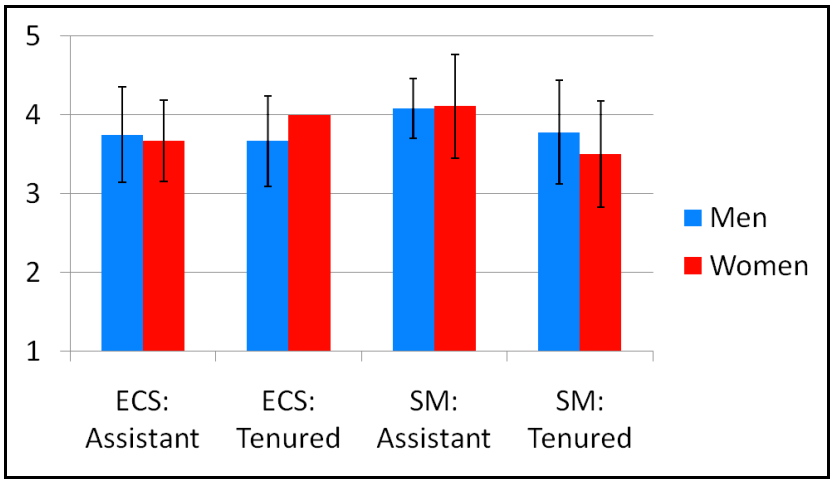
Analysis of Variance. After preliminary (descriptive) analyses were conducted, Analysis of Variance (ANOVA) was used to examine group differences in responses about workplace climate. The independent variables in the analyses were college (ECS, SM), rank (assistant, tenured), and sex (women, men). We examined the influence of these independent variables on numerous dependent variables including climate-related subscales or individual items.

Results

a) Job Satisfaction

We used a one-item measure to assess job satisfaction: "All things considered, I am satisfied with my current position." This item was obtained from University of Michigan's ADVANCE climate survey. Past research has suggested a one-item measure of job satisfaction is valid (Dolbier, Webster, McCalister, Mallon, & Steinhardt, 2005). Respondents rated this item on a 5-point agreement scale ranging from 1 (strongly disagree) to 5 (strongly agree). There were no significant differences in responses between college, rank, or sex for job satisfaction (see Figure 1). Overall, given the possible values for the ratings, they denote greater job satisfaction (scores are above the midpoint of the scale, which is 2.5) and are comparable to other climate survey data from other institutions (e.g., University of Michigan). (Note: The absence of an error bar denotes zero variability).

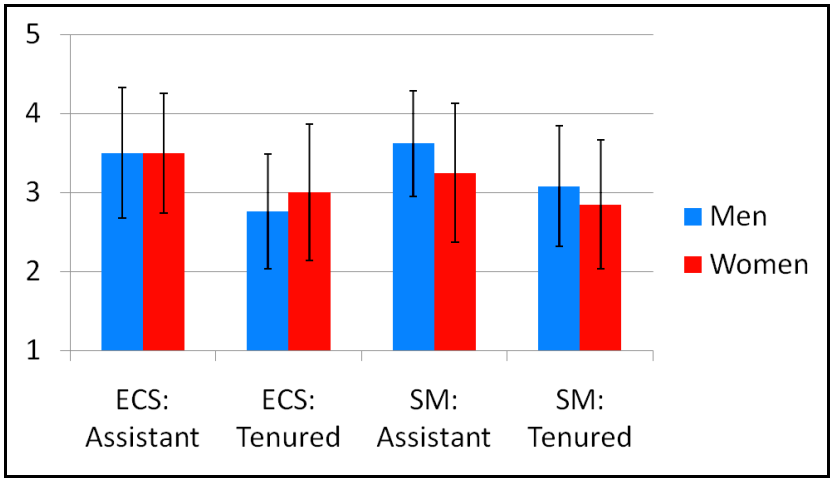
Figure 1. *Job Satisfaction*



b) Intentions to Quit

We used a one-item measure to assess intentions to quit: "I have seriously considered leaving this institution". This item was from University of Michigan's ADVANCE climate survey. Past research has suggested a one-item measure of turnover intent is valid (Beehr & Gupta, 1978). Respondents rated this item on a 5-point agreement scale ranging from 1 (strongly disagree) to 5 (strongly agree). This item was reverse-scored so that higher scores denote a better climate and lower intentions to quit. There were no significant differences in responses between college, rank, or sex for intentions to quit (see Figure 2). Overall, given the 5-point scale, the ratings denote lower intentions to quit (scores are above the midpoint of the scale, which is 2.5) and are comparable to other climate survey data from other institutions (e.g., University of Michigan).

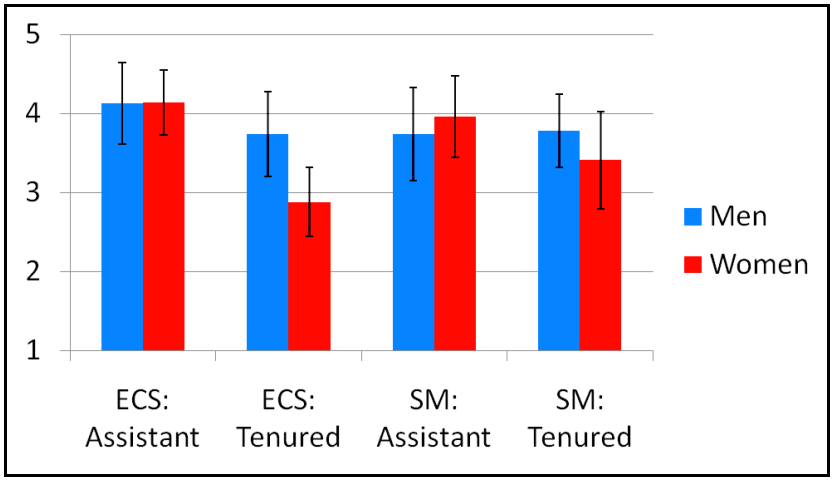
Figure 2. *Intentions to Quit*



c) Transformational Leadership

Transformational leadership was assessed by creating items from transformational leadership theory (Bass, 1997) and modifying questions from the Multifactor Leadership Questionnaire (Trepper & Percy, 1994). Scale items were determined by using exploratory factor analysis and include, "Emphasizes the importance of a collective sense of mission," "Expresses confidence in the unit/department's ability to meet our goals," "Is enthusiastic about what needs to be accomplished," "Maintains high standards for the department," "Articulates a clear vision for the unit/department," "Instills pride in the unit/department," and "Acts in ways to build my respect." This was a reliable subscale ($\alpha = .95$). Respondents rated each item on a 5-point agreement scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores denote better perceptions about departmental leadership. The ANOVA revealed a main effect for rank, $F(1,134) = 4.62$, $p = .03$. Figure 3 shows that assistant level faculty had higher ratings that their department leader was more transformational ($M = 3.96$, $SD = 1.03$) than tenured faculty ($M = 3.69$, $SD = 1.04$).

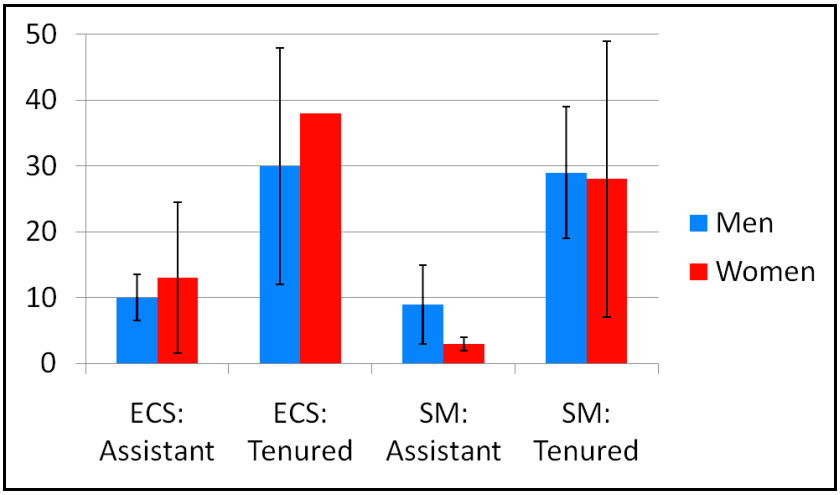
Figure 3. *Transformational Leadership*



d) Number of Peer-Reviewed Publications

We used a one-item measure, adapted from the University of Michigan's ADVANCE climate survey, to assess the number of peer-reviewed publications as a proxy for respondents' productivity in their research area. The ANOVA revealed a main effect of rank, $F(1,118) = 6.33$, $p = .01$, but no other significant mean differences were found. Figure 4 shows that tenured faculty ($M = 29.48$, $SD = 31.65$) had reported significantly more peer-reviewed publications than assistant faculty ($M = 8.47$, $SD = 12.03$). (Note: The absence of an error bar denotes zero variability).

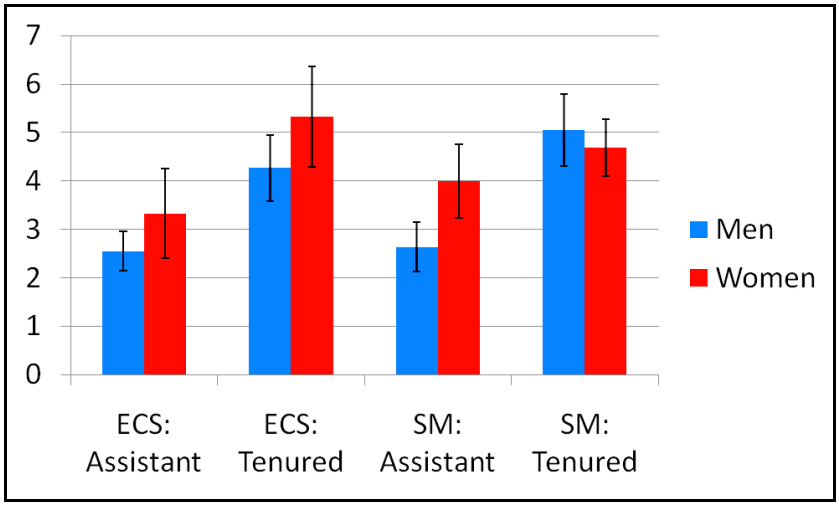
Figure 4. *Number of Peer-Reviewed Publications*



e) Number of Committees Served

We used a one-item measure, adapted from the University of Michigan's ADVANCE climate survey, to measure the number of committees a respondent served on, as a proxy for service participation. The ANOVA revealed a significant main effect for both rank, $F(1,135) = 26.69$, $p = .00$, and sex, $F(1,135) = 4.67$, $p = .03$. Figure 5 shows that tenured faculty ($M = 4.64$, $SD = 1.44$) reported serving on more committees than assistant level faculty ($M = 3.03$, $SD = 1.34$), and that women faculty reported serving on more committees ($M = 4.30$, $SD = 1.56$) than men faculty ($M = 4.21$, $SD = 1.58$).

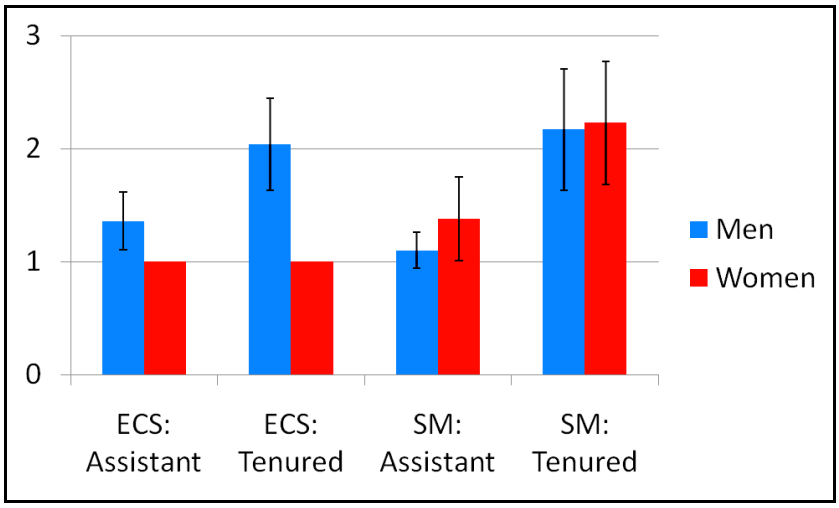
Figure 5. *Number of Committees Served*



f) Number of Committees Chaired

We used a one-item measure, adapted from the University of Michigan's ADVANCE climate survey, to assess the number of committees a respondent has chaired to assess leadership opportunities. The ANOVA revealed a main effect of rank, $F(1,127) = 5.66$, $p = .02$. Figure 6 shows that tenured faculty ($M = 2.10$, $SD = .95$) reported chairing more committees than assistant level faculty ($M = 1.23$, $SD = .49$). (Note: The absence of an error bar denotes zero variability).

Figure 6. *Number of Committees Chaired*

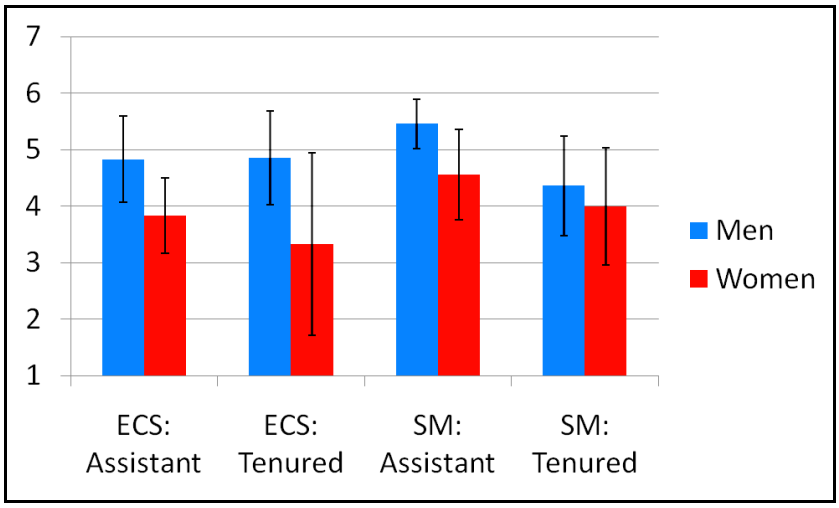


g) How the Department Views My Productivity

We used a one-item measure, adapted from the University of Michigan's ADVANCE climate survey, to assess departmental views of productivity. The item was, "Using the criteria you checked above, how do you think your department views your productivity, compared to the departmental average?" Respondents rated this item using a 7-point rating scale ranging from 1

(less productive) to 7 (more productive). Higher scores denote higher perceptions of how the department views the respondent's productivity. The ANOVA revealed a main effect of sex, $F(1,139) = 5.70$, $p = .02$. Figure 7 shows that men faculty rated that the department viewed their productivity as significantly better ($M = 4.76$, $SD = 1.63$) than women faculty ($M = 4.06$, $SD = 1.88$).

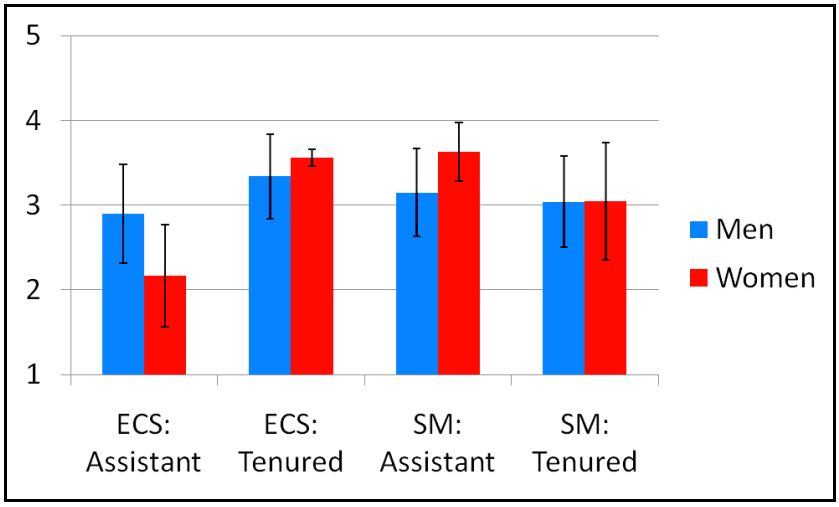
Figure 7. *How the Department Views My Productivity*



h) Political Skill in Networking

We assessed respondents' perceptions about their own political skill in networking, using Ferris et al.'s (2005) Political Skill Inventory. To reduce items for our climate survey, rather than use the 18-item scale reported in Ferris et al., we used the three items with the highest factor loadings. These three items were reliable ($\alpha = .88$) and were, "I spend a lot of time and effort networking with others," "I know a lot of important people and am well connected," and "I am good at using my connections and networks to make things happen." Respondents rated items on 5-point agreement scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores denote higher perceptions of respondent networking political skills. The ANOVA revealed a significant college by rank interaction, $F(1,134) = 6.04$, $p = .02$. Figure 8 shows that in ECS, tenured faculty had higher ratings of their networking political skills ($M = 3.35$, $SD = .97$) than assistant level faculty ($M = 2.63$, $SD = 1.19$), whereas in SM, assistant level faculty had higher ratings of their networking political skill ($M = 3.33$, $SD = .93$) than tenured faculty ($M = 3.04$, $SD = 1.15$).

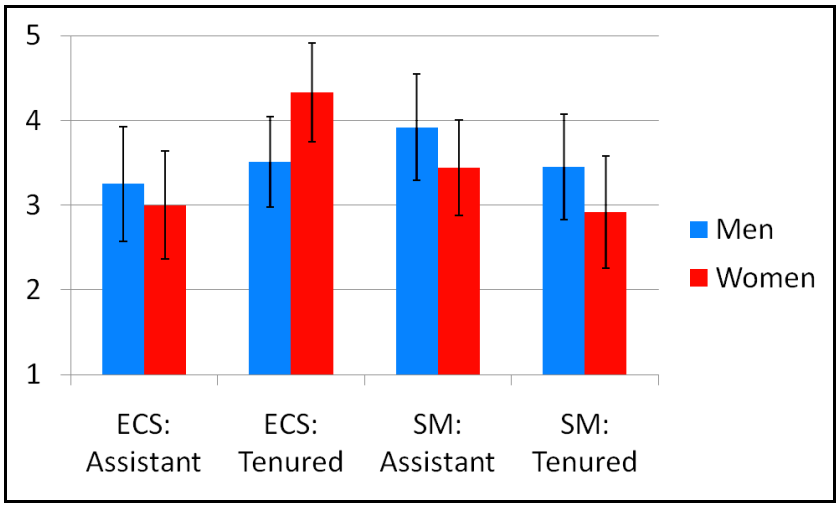
Figure 8. *Political Skill in Networking*



i) Colleagues Solicit My Opinion

We used a one-item measure to assess how often colleagues solicit respondents' opinions: "My colleagues solicit my opinions about their research ideas and problems." This item was adapted from the University of Michigan's ADVANCE climate survey. Respondents rated this item on a 5-point agreement scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores denote higher perceptions that colleagues solicit their opinions. The ANOVA revealed a significant college by rank interaction, $F(1,137) = 5.27$, $p = .02$. Figure 9 shows that in ECS, tenured faculty had higher ratings of the solicitation of their opinions (M = 3.56, SD = 1.08) than assistant level faculty (M = 3.17, SD = 1.30), whereas in SM, assistant level faculty had higher ratings of the solicitation of their opinions (M = 3.73, SD = 1.20) than tenured faculty (M = 3.31, SD = 1.27).

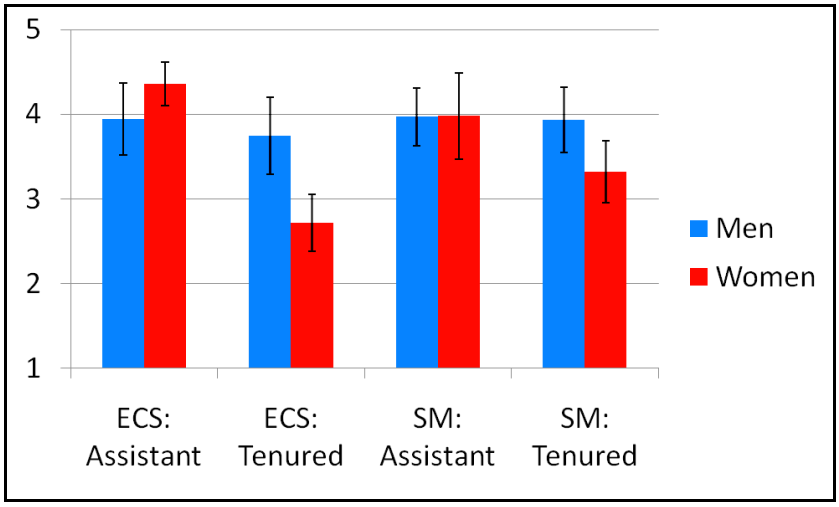
Figure 9. *Colleagues Solicit My Opinion*



j) Collegiality in the Department

We assessed respondents' perceptions of their collegiality using questions adapted from the University of Michigan's ADVANCE climate survey that assessed the department climate. We used the six items with the highest factor loadings. These six semantic differential items, rated on a 5-point scale, were reliable (α = .91). The items were: friendly (reverse scored; 1 = friendly, 5 = hostile), cooperative (reverse scored; 1 = cooperative, 5 = competitive), respectful (1 = disrespectful, 5 = respectful), collegial (reverse scored; 1 = collegial, 5 = contentious), collaborative (reverse scored; 1 = collaborative, 5 = individualistic), and supportive (1 = unsupportive, 5 = supportive). Higher scores denote higher perceptions of department collegiality. The ANOVA revealed a main effect of rank, $F(1,140) = 10.40$, $p = .00$, and a significant rank by sex interaction, $F(1,140) = 6.90$, $p = .01$. Figure 10 shows that assistant level faculty had higher ratings of collegiality ($M = 4.03$, $SD = .81$) than tenured faculty ($M = 3.73$, $SD = .86$). Also, assistant level women had higher collegiality ratings ($M = 4.13$, $SD = .85$) than assistant level men ($M = 3.96$, $SD = .80$), whereas tenured men had higher collegiality ratings ($M = 3.83$, $SD = .85$) than tenured women ($M = 3.21$, $SD = .74$).

Figure 10. *Collegiality in the Department*

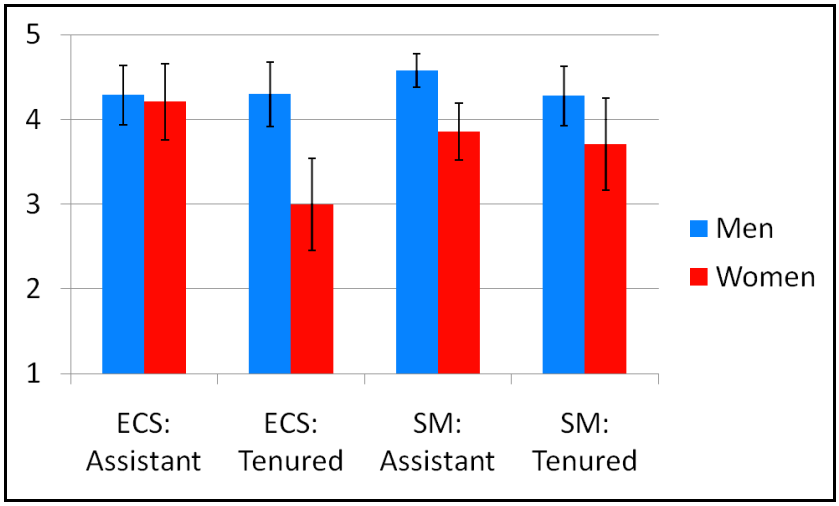


k) Department Does Not Engage in Sex Discrimination

We assessed respondents' perceptions about their departmental sex discrimination using questions adapted from the University of Colorado at Boulder (UC), University of Illinois at Chicago (UIC), and University of Michigan (UM)'s climate surveys which assessed the department work climate for men and women faculty. We used the four items with the highest factor loadings in our exploratory factor analysis. These four items were reliable (α = .74) and were, "Some colleagues make me feel inadequate, as if I were hired because of my gender," "My colleagues expect me to be a spokesperson for others of my gender," "Sex discrimination or harassment is a problem in my department," and "Faculty do not often speak up when they see an instance of sex discrimination." Respondents rated these items on a 5-point agreement scale ranging from 1 (strongly disagree) to 5 (strongly agree). All items were reverse-scored so that

higher scores denote less departmental sex discrimination. The ANOVA revealed a main effect of sex, $F(1,138) = 13.96$, $p = .00$, and rank, $F(1,138) = 5.26$, $p = .02$. Figure 11 shows that men faculty had higher ratings of their department not engaging in sex discrimination ($M = 4.33$, $SD = .70$) than women faculty ($M = 3.78$, $SD = .95$), and assistant level faculty had higher ratings of their department not engaging in sex discrimination ($M = 4.28$, $SD = .67$) than tenured faculty ($M = 4.19$, $SD = .83$).

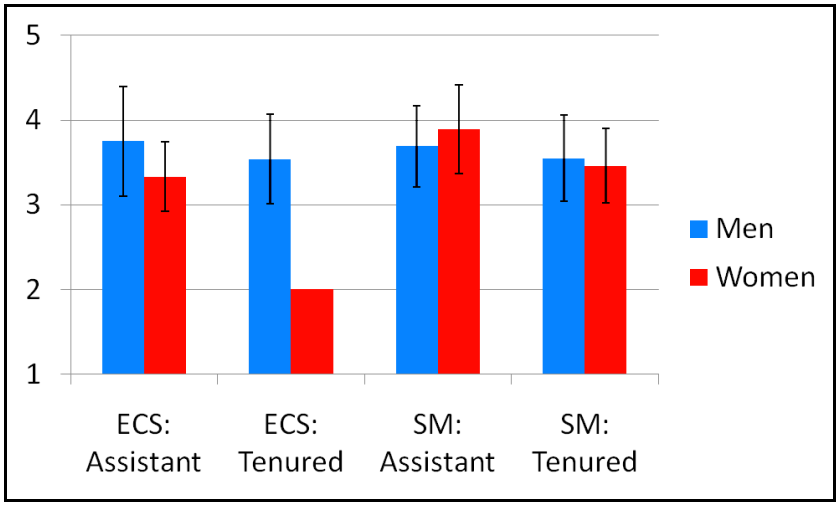
Figure 11. *Departmental Does Not Engage in Sex Discrimination*



l) Department has Enhanced Climate for Women

We used a one-item measure to assess the department climate for women: "My department has taken steps to enhance the climate for women." This item was from the University of Illinois at Chicago's WISEST climate survey. Respondents rated this item on a 5-point agreement scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores denote higher perceptions of an enhanced department climate for women. The ANOVA revealed a main effect of college, $F(1,134) = 4.16$, $p = .04$, and rank, $F(1,134) = 4.76$, $p = .03$, and a significant college by sex interaction, $F(1,134) = 4.56$, $p = .04$. Figure 12 shows that faculty in SM had higher ratings of an enhanced department climate for women ($M = 3.60$, $SD = .97$) compared to faculty in ECS ($M = 3.49$, $SD = 1.09$), and assistant level faculty had higher ratings of an enhanced department climate for women ($M = 3.70$, $SD = 1.04$) than tenured faculty ($M = 3.49$, $SD = 1.02$). Also, in ECS, men had higher ratings of an enhanced department climate for women ($M = 3.58$, $SD = 1.09$) than women in ECS ($M = 2.89$, $SD = .93$), whereas in SM, women had higher ratings of an enhanced department climate for women ($M = 3.64$, $SD = .95$) than men ($M = 3.59$, $SD = .98$). (Note: The absence of an error bar denotes zero variability).

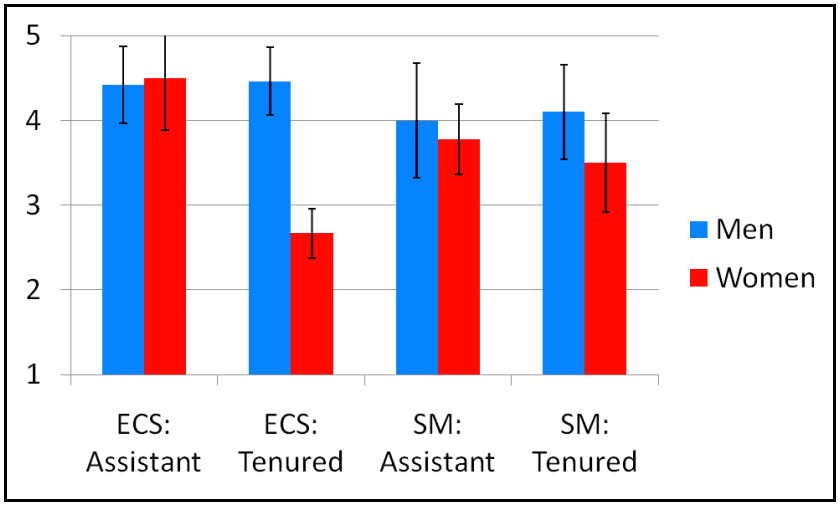
Figure 12. *Department has Enhanced Climate for Women*



m) Departmental Non-sexism

We used a one-item measure from the University of Michigan's ADVANCE climate survey to assess departmental sexism: "Please rate the climate of your unit/department on the continuum by selecting the appropriate corresponding number." Respondents rated this item on a 5-point rating scale ranging from 1 (non-sexist) to 5 (sexist). This item was reverse-scored and higher scores denote less departmental sexism. The ANOVA revealed a main effect of sex, $F(1,139) = 7.11$, $p = .01$, and rank, $F(1,139) = 4.26$, $p = .04$, and a significant rank by sex interaction, $F(1,139) = 5.64$, $p = .02$. Figure 13 shows that men had higher ratings of the department not engaging in sexism ($M = 4.29$, $SD = 1.00$) than women ($M = 3.69$, $SD = 1.12$), and assistant level faculty had higher ratings of the department not engaging in sexism ($M = 4.15$, $SD = 1.09$) than tenured faculty ($M = 4.16$, $SD = 1.04$). The interaction illustrates that tenured men ($M = 4.31$, $SD = .96$) and non-tenured men ($M = 4.21$, $SD = 1.14$) and non-tenured women ($M = 4.07$, $SD = 1.03$) had similar, higher ratings that the department did not engage in sexism, whereas tenured women rated the departments as lower on engaging in sexism ($M = 3.35$, $SD = 1.12$). (Note: In Figure 13, the error bar for ECS assistant women extends to 5.12).

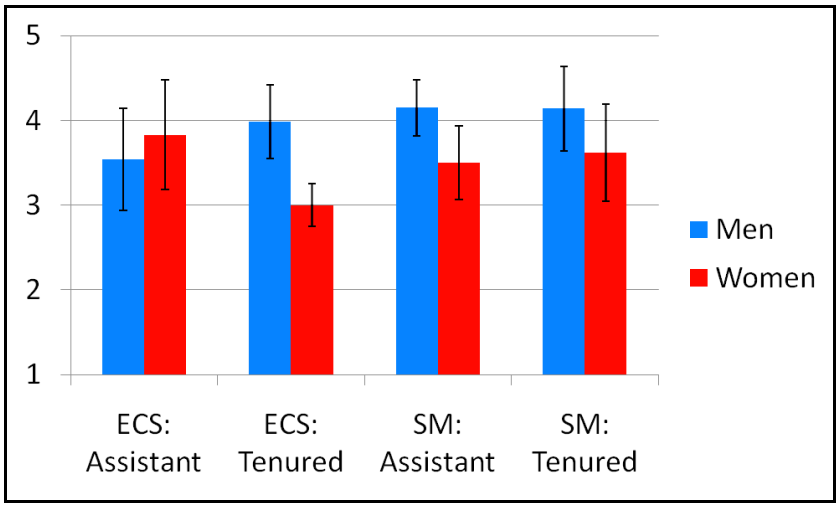
Figure 13. *Departmental Non-sexism*



n) Department is Open to Women

We assessed respondents' perceptions of whether the department is open to women using questions adapted from the University of Illinois at Chicago's WISEST climate survey. We used the two items with the highest factor loadings. These two items were reliable (r = .41) and were, "Faculty would be comfortable with a woman or a man as department head" and "The climate for women in my department is good." Respondents rated this item on a 5-point agreement scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores denote higher perceptions of the openness of the department to women. The ANOVA revealed a main effect of sex, $F(1,137) = 4.29$, $p = .04$. Figure 14 shows that men had higher ratings of the department being open to women (M = 4.01, SD = .94) than women (M = 3.56, SD = 1.03).

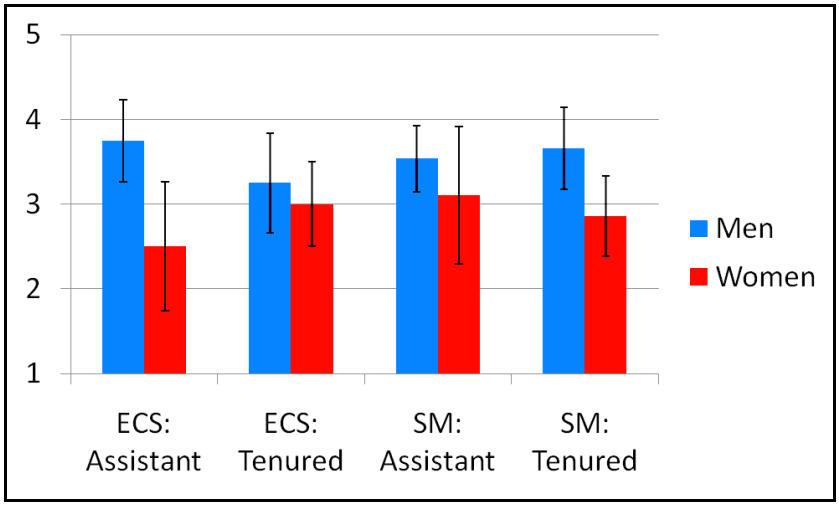
Figure 14. *Department is Open to Women*



o) Balance between Professional and Personal Life

We used a one-item measure to assess respondents' satisfaction with the balance between professional and personal life: "Balance between my professional and personal life." This item was from the University of Michigan's ADVANCE climate survey. Respondents rated this item on a 5-point agreement scale ranging from 1 (very dissatisfied) to 5 (very satisfied). Higher scores denote better balance between professional and personal life. The ANOVA revealed a main effect of sex, $F(1,138) = 6.91$, $p = .01$. Figure 15 shows that men had higher satisfaction ratings of the balance between their professional and personal life ($M = 3.47$, $SD = 1.06$) than women ($M = 2.87$, $SD = 1.24$).

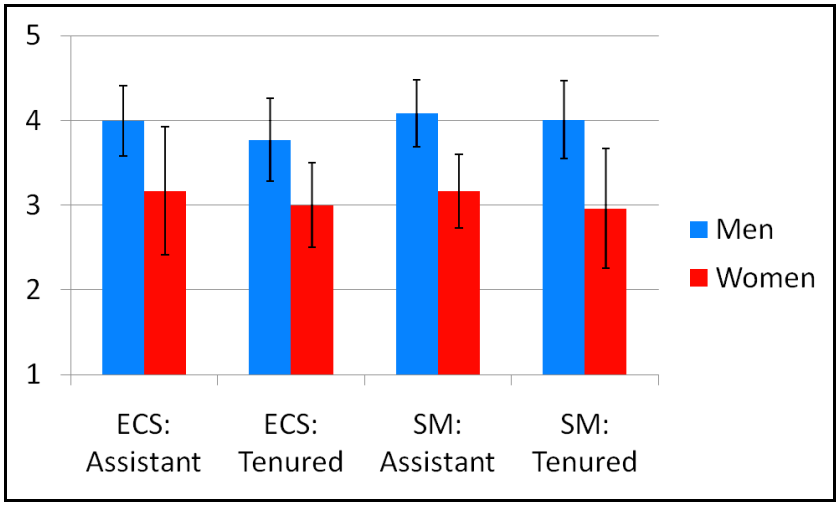
Figure 15. *Balance between Professional and Personal Life*



p) Women have Influence in the Department

We assessed perceptions that women have influence in the department using questions adapted from the University of Illinois at Chicago's WISEST climate survey. We used the two items with the highest factor loadings in our exploratory factor analysis. These two items were reliable ($r = .47$) and were, "Women faculty are less likely than men to have influence in departmental politics and administration" and "Men faculty are more likely than women faculty to be involved in informal social networks within the department." Respondents rated these items on 5-point agreement scales ranging from 1 (strongly disagree) to 5 (strongly agree). All items were reverse-scored so that higher scores denote higher perceptions of a woman's influence in the department. The ANOVA revealed a main effect of sex, $F(1,136) = 14.23$, $p = .00$. Figure 16 shows that men had higher ratings of women faculty's influence in the department ($M = 3.91$, $SD = .92$) than women ($M = 3.06$, $SD = 1.20$).

Figure 16. *Women have Influence in the Department*



Summary

There were no differences in ratings of job satisfaction or intentions to quit, which were comparable with ratings of faculty from other ADVANCE institutions. However, our climate survey did reveal significant differences in the regional STEM climate amongst tenure-track faculty.

Differences by Rank

Overall, we found six significant differences between assistant faculty and tenured faculty. Assistant tenure-track faculty reported having fewer peer-reviewed journal articles, and serving on or chairing fewer committees than tenured faculty, as would be expected. Assistant tenure-track faculty had more favorable ratings of their department chair, rating them higher in transformational leadership. Conversely, along with rating their chair as lower in transformational leadership, tenured faculty rated their departments less favorably on sex discrimination and on enhancing the climate for women. These findings suggest that tenured faculty perceive a different department climate than assistant level faculty.

In addition to these main effects, rank interacted with college on two items. Assistant professors in ECS reported the least favorable perceptions of their networking political skills, and assistant professors in ECS and tenured professors in SM had the lowest perceptions that colleagues solicit their opinions.

Differences by Sex

There were many differences in perceptions of climate that depended upon the sex of the responder. Women STEM faculty rated themselves lower than men on the following items: department views of my productivity, department does not engage in sex discrimination, department is open to women, women have influence in the department, and balance between professional and personal life. Also, women faculty reported serving on more committees than men. Although there were no sex differences in the number of peer-reviewed journal articles

reported and women served on significantly more committees than men, women still rated that their departments viewed their productivity as lower, compared to men. This is one place where perceptions may be clarified for men and women at the department level.

There were three interactions with sex. Tenured women had the least favorable perceptions of collegiality and perceptions that the department is non-sexist. Women in ECS had the least favorable perceptions of the department having an enhanced climate for women.

Conclusions

Overall, women and men differ in their perceptions of how productive their department thinks they are, in the extent of unit collaboration, and in their department being open to women. Given these findings, it is clear that there are different perceptions of departmental climate, depending upon the sex of the responder. However, it is also important to note that there are different perceptions of departmental climate, depending upon the tenure status of the responder. The department level is where faculty experience workplace climate. The present results suggest a mismatch between productivity and service reports, and perceptions of the departments' views for men and women faculty. Specifically, there were no sex differences in number of publications, but women did serve on more committees than men. Yet, women perceived that the department evaluated their productivity lower, compared to men. Perhaps this mismatch is one indicator that the felt climate is actually different for men and women. Regardless of the veridicality of these perceptions, it is important to note that there are differences in perceptions of department climate for men and women faculty that could be addressed.

The research team has suggested that these perceptions might be moderated by continuing the unconscious bias workshops across the consortium. Presently, the workshops have been geared at search committees. However, given the economic climate nationally, efforts have shifted to also include leadership across the consortium (i.e., department chairs). The findings of the present climate survey suggest that the unconscious bias workshops should be offered to all STEM faculty. In addition, the climate survey data suggest that chair training might facilitate better perceptions toward leadership in general, and toward particular climate indicators specifically. For example, chairs know their faculty service, publishing, and grant funding levels. Could chairs be more forthcoming about this knowledge? Or, could chairs be aware of how unconscious bias might be operating at the department level and try to influence better perceptions amongst department colleagues about these productivity indicators? Further, offering writing workshops for assistant-level STEM women should bolster their actual productivity as well as their perceptions of productivity. Networking opportunities could enhance discipline-related perceptions of collegiality and perhaps those within the department. Mentoring and chair training are both department level initiatives that should bolster perceptions of a hospitable department climate.

In summary, the LEADER consortium is comprised of four diverse institutions who have joined together to address a regional and national concern - enhancing the recruitment, advancement, and success of STEM women. This first consortium climate survey provides the backdrop through which we begin to understand our regional climate and enhance the environment for STEM women in the academy. Generally, the climate issues were similar across the consortium, with a few institutional differences (provided for those institutions). Through our collaboration, it is our hope that we will learn from each other to evaluate and implement best practices for creating a sustainable, progressive regional environment. Our future endeavors include a summary of the climate survey which compares the STEM climate with that of the Social and Behavioral Sciences climate across the consortium, in addition to enacting the initiatives to promote a better STEM climate for all.

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