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CEOS/ADVANCE
COMPREHENSIVE EQUITY AT OHIO STATE

NATIONAL SCIENCE FOUNDATION ADVANCE
PROGRAM FOR INSTITUTIONAL TRANSFORMATION

Women STEM Faculty at Ohio State: Resource Allocation and Department Climate

Joan M. Herbers
Principal Investigator

Anand Desai
Research Director

April 2012

Inside:

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For more information about this report or Project CEOS, please contact:
ADVANCE/CEOS
108 Aronoff Laboratory
318 W. 12th Avenue
Columbus, Ohio 43210
ceos@osu.edu

Joan M. Herbers is a Professor of Evolution, Ecology & Organismal Biology at The Ohio State University. Trained as an ecologist, Herbers worked for years on the evolution of insect societies; that research program attracted numerous research grants and generated more than 100 articles. Herbers came to Ohio State to assume the position of Dean of the College of Biological Sciences, a position she held from 2002 to 2008. She also serves as Principal Investigator of the NSF-funded project Comprehensive Equity at Ohio State. In addition to her academic work, she has served as President of the Association for Women in Sciences and participated in numerous programs to support careers for women in the STEM disciplines.

Anand Desai is a Professor in the John Glenn School of Public Affairs at The Ohio State University. He also holds a courtesy appointment in the Management Science Department of the Fisher College of Business and is a member of the faculty of the Environmental Science Graduate Program. He is a member of the Executive Council of the National Association of Schools of Public Affairs and Administration and was a member of the Commission on Peer Review and Accreditation. He serves on the editorial board of the *Journal of Public Affairs Education.* He also has served as a member of the Policy Council of the Association for Public Policy Analysis and Management. His research interests include measurement of performance and evaluation of the provision of public services. He is a Co-PI on Comprehensive Equity at Ohio State and is a leading member of the project's subcommittee on research design and data analysis.

THE OHIO STATE UNIVERSITY

Office of the President

205 Bricker Halll
190 N. Oval Mall
Columbus, OH 43210-1357

Phone (614) 292-2424
Fax (614) 292-1231

Message from President E. Gordon Gee

There are many methods by which success is measured in higher education – academics, rankings, graduation rates, and research prowess, among other metrics. The core of our efforts is our determination to move from excellence to eminence. At Ohio State, we believe that eminence is not defined by individual efforts, but our ability to work as One University, driven by both a common purpose and a compelling mission.

I am pleased to present the enclosed report, which shares important insights into our progress in reaching this goal. Specifically, this report focuses on the progress of three academic units, which are collectively known as the CEOS Colleges, named for involvement in the Comprehensive Equity program at Ohio State. CEOS is funded by the National Science Foundation's ADVANCE program, a multi-disciplinary effort that seeks to promote and improve career success for our women faculty in the sciences, technology, engineering, and mathematics (STEM). This report examines our resource use and faculty perceptions of their work environment in these specific colleges.

As you will read in the following pages, Ohio State has done a superb job at equalizing access of men and women faculty to financial and space resources. Detailed analysis of many different areas, including salary, start-up funds, laboratory square footage, and teaching assignments, shows that no gender gap exists in our CEOS colleges.

However, as with any comprehensive examination, there are areas for improvement. Responses to the University Faculty Survey, which measures faculty members' satisfaction with their colleagues, their sense of being appreciated, and their overall commitment to Ohio State, show substantial and persistent gender gaps in the STEM units. It is clear from these results that we must continue our work to enhance the departmental and college culture, while also providing equal opportunity for all faculty members to succeed if we are to effectively move toward One University.

I do hope that you find this report useful. I am grateful to the work of the CEOS team for taking a closer look at workplace issues for STEM faculty, and believe they have shown us productive paths to follow as we strive for eminence.

Sincerely,

E. Gordon Gee

E. Gordon Gee
President

CEOS/ADVANCE
COMPREHENSIVE EQUITY AT OHIO STATE

Women STEM Faculty at Ohio State:
Resource Allocation and Department Climate

EXECUTIVE SUMMARY

Comprehensive Equity at Ohio State (CEOS) has released two studies on the status of men and women faculty working at Ohio State.

As at other research universities, faculty in STEM (Science, Technology, Engineering, and Mathematics) are predominantly male. Furthermore, retention of women faculty substantially lags behind retention of men, they take longer to achieve promotion to Professor, and they are under-represented among senior leaders. Our two studies shed light on resource allocation and department climate for men and women faculty in STEM at Ohio State. We focus on three units for intensive analysis: the CEOS Colleges include the College of Engineering, the College of Veterinary Medicine, and the Division of Natural and Mathematical Sciences in the College of Arts and Sciences. Other STEM units exist at Ohio State (e.g. health sciences, agriculture, natural resources), and we encourage those units to conduct similar studies from their data.

The first study examines four measures that reflect c*onditions of employment:* salary, laboratory space, startup funding, and teaching loads. Substantial differences across colleges were found for those variables, as well as across disciplines within colleges. However, no significant differences between men and women faculty were uncovered. Men and women faculty appear to have equivalent access to monetary, space, and teaching resources. A cautionary note remains: we were unable to meaningfully measure service loads, which have been found to differ by gender at other institutions.

The second study examines *faculty perceptions* of their working environment. Men and women faculty were equally satisfied with their salaries, teaching loads, and lab space, results that align well with the first study. However, persistent gender differences in satisfaction with colleagues, access to information networks, and with overall workloads showed that women faculty in STEM are less happy than their male colleagues, and also less happy than women faculty in other units.

Taken together, the reports show that the University has done well at equilibrating men's and women's access to *material resources*, but less well at ensuring that all faculty have equally satisfying work environments. At Ohio State, the challenge for gender equity in STEM lies in departmental culture and interpersonal interactions. We provide some recommendations for meeting that challenge.

SETTING THE CONTEXT: STEM AT OHIO STATE

In 2009, Ohio State was awarded an Institutional Transformation Award from the National Science Foundation's ADVANCE Program. This five-year effort, named Comprehensive Equity at Ohio State (CEOS), focuses on retention and career progression for women faculty in the STEM disciplines (science, technology, engineering, and mathematics).

Our focus was prompted by an early analysis of faculty recruitment and retention. The prevailing pattern across STEM units showed that we recruited women to tenure-track positions at or above their availability in applicant pools. However, faculty retention showed a serious and persistent gender gap: women faculty left the university at much higher rates than did men. This revolving door, prevalent among pre-tenure faculty, was coupled with a post-tenure gender gap in career progression. After tenure, women faculty took longer than men to be promoted to Professor, and fewer achieved academic leadership roles.

To improve our record of faculty retention and career progression for women, Project CEOS developed programs for academic leaders and for faculty, all supported by a research design that is itself motivated by our model of Transformational Leadership:

Our model includes five elements that together define transformational leadership. Of those elements, two were in place when we received funding.

Vision of Support and Inclusiveness: Ohio State has adopted and projected a vision for faculty success, by providing access to modern research facilities, mentoring junior faculty, promoting leadership development, and cultivating a culture of excellence.

Flexible Career Policies: Ohio State University has adopted and implemented a wide series of institutional policies that are critical for supporting faculty success. Our University Rules provide opportunities for individual faculty to have additional time "on the tenure clock" for a variety of reasons, including childbirth or adoption, unplanned interruptions to research programs, and other exigencies. We also have on-campus child care, as well as provisions for working part-time while on the tenure track and dual career hiring.

The remaining elements of the Transformational Leadership model are at the center of Project CEOS. We aim to:

Ensure that individual needs are understood and met. This requires self-assessment of strengths and weaknesses by faculty and academic leaders alike, coupled with tools for clear and honest communication.

Question and shift cultural assumptions. STEM professionals work in normed ways, not all of which support the goal of academic excellence. Departmental culture is the single most important determinant of faculty satisfaction, yet STEM faculty rarely discuss subjects such as outmoded concepts of the "ideal worker", subconscious bias, or different classroom experiences of women and men faculty, all factors that affect career progression and satisfaction.

Change practices to accommodate diversity. Once units have identified cultural assumptions that impede faculty retention and career progression, they can implement practices that reflect shifts in those assumptions.

All five components of our Transformational Leadership Model are woven into the CEOS programs:

- Workshops for deans and chairs provide information on gender issues in STEM and help academic leaders identify desired changes in practice for their units
- Action Learning Teams, comprising senior faculty and staff, develop localized strategies for promoting faculty success
- Peer mentoring provides tenured women in STEM real-time support and assistance for problem solving in their professional lives
- Entrepreneurship training for women in STEM encourages use of commercialization strategies to extend the reach of their research

CEOS works intensively with three academic STEM units: all the programs above are offered to the College of Engineering, the College of Veterinary Medicine, and the Division of Natural and Mathematical Sciences within the College of Arts and Sciences. Opportunities for professional development (3 and 4 above) are open to all women faculty in STEM across the university. In addition, CEOS contributes to the Academic Leadership Development series organized by the Office of Academic Affairs, and jointly offers a program in Laboratory Management with The Women's Place.

Part I.
Conditions of Employment for Faculty in STEM[1]

Background

Several research universities have examined conditions of employment for faculty in STEM, and some have found persistent differences between men and women. Accordingly, the Office of Academic Affairs at Ohio State appointed a committee of faculty and staff to conduct a comprehensive examination of multiple variables that reflect conditions of employment in the CEOS colleges.

General Methodology

The Committee spent several weeks discussing its charge and the kinds of data to be examined. We ultimately settled on four key variables that reflect conditions of employment:

1. Salary
2. Startup accounts
3. Square footage of lab space
4. Teaching loads

Data on *salary* are stored in the central Human Resources database. Data on *startup accounts* offered to incoming faculty were provided by Dean's offices. *Area of lab spaces* came from the Office of Research database as well as college offices, and data on *teaching loads* came from the Registrar and college offices.

Summary

Overall we found no gender differences in four metrics related to employment conditions. Our results show that deans and chairs of these units have done a very good job equilibrating assignments and reward structures between male and female faculty. This interpretation is further strengthened by results from the OSU faculty survey that showed no differences between men and women faculty in their satisfaction with salary, lab space, and teaching assignments (see Part II).

1. Faculty Salaries

Faculty salaries were the trickiest of all metrics to study, because so many factors affect what tenure-track faculty are paid. Rank, market forces, length of service, and professional accomplishment all complicate analysis. Of the three faculty ranks, Assistant Professor salaries are the least complicated, because starting salaries are relatively invariant and time in that rank is limited. By contrast, Associate Professor salaries are prone to salary compression (if raise pools do not keep pace with market increases in starting salaries); furthermore, salaries of those who have been in this rank longer than 10 years tend to reflect different forces than salaries of those recently promoted from Assistant Professor. Finally, variation in salaries for Professors arises from time in rank, market forces (e.g. external offers, hires from other universities) and previous administrative experience. To simplify analysis, we excluded individuals who held administrative appointments, named chairs, or University Professorships.

Methods

Only tenure-track faculty whose Tenure Initiating Unit (TIU) was in a CEOS college[2] were included in our survey. We used data on salary from the October 2009 snapshot. All salaries were converted to nine-month equivalents.

The initial data analysis was granular to identify suggestive trends and methods of further analysis. It quickly became apparent that data aggregation would be necessary to maintain anonymity and achieve interpretable results. For example, an individual department might have one woman Associate Professor in rank for 3 years and 2 males in rank for 5 years. We chose to aggregate two of our primary variables, time in rank and department; rank and gender were retained as in the original database.

We collapsed time in rank to the following seven categories:

- Assistant Professors
- Associate Professors in rank 0-5 years
- Associate Professors in rank 6-11 years
- Associate Professors in rank 12+ years
- Professors in rank 0-5 years
- Professors in rank 6-11 years
- Professors in rank 12+ years

We also pooled data across departments with similar market conditions and ethos; data were aggregated within, not across, college affiliations into 8 groups (see details at ceos.osu.edu). We then examined salaries as a function of departmental group, rank, time in rank, and gender. A mixed-effects regression model was run first on the entire dataset, and then separately by group.

Findings

Substantial differences among disciplines reflected market forces. We found evidence of salary compression among Associate Professors across the board, and in some units there was also evidence of salary compression among Professors. Results of a multiple regression (Table 1) explained 56 percent of the variance.

Table 1. Results from a multiple regression of variables on salary.

Source of Variation	F ratio	Probability
Department Group	25.59	<0.0001
Rank	262.28	<0.0001
Time in Rank	2.32	0.128
Rank * Time in Rank	11.41	<0.0001
Gender	0.08	0.778

The model did not show an overall gender gap for salary. Rather, variation among faculty salaries derived primarily from discipline and faculty rank. The interaction of time in rank with rank itself reflected the result that Associate Professor salaries remained static despite length of time in tenure whereas salaries of Professors tended to increase the longer they were in rank. That is, salary compression was most serious among Associate Professors.

2. Startup Funds

In the STEM disciplines, newly-hired faculty are offered funds to support purchase of equipment, hiring laboratory personnel, and so on. These "startup accounts" are negotiated as part of the original offer, and they can be substantial; for hires at the Professor level, startup funds exceeding $1M are common in the STEM disciplines. There is substantial variation across disciplines with regard to normed startup figures, and even within departments norms vary across specific research areas.

Methods

There are no standard definitions for what is included in startup. In addition to the startup funds *per se*, additional commitments can be made in the form of laboratory/office renovations, major equipment purchases, summer salary support, graduate assistant support, and time released from teaching. Available data restricted our attention to the startup funding *sensu stricto*.

Startup data for recent years were provided by college offices. We had data for

- 110 faculty in NMS
- 68 faculty in Engineering
- 49 faculty in Veterinary Medicine (including 9 faculty hired on clinical track who required equipment purchases)

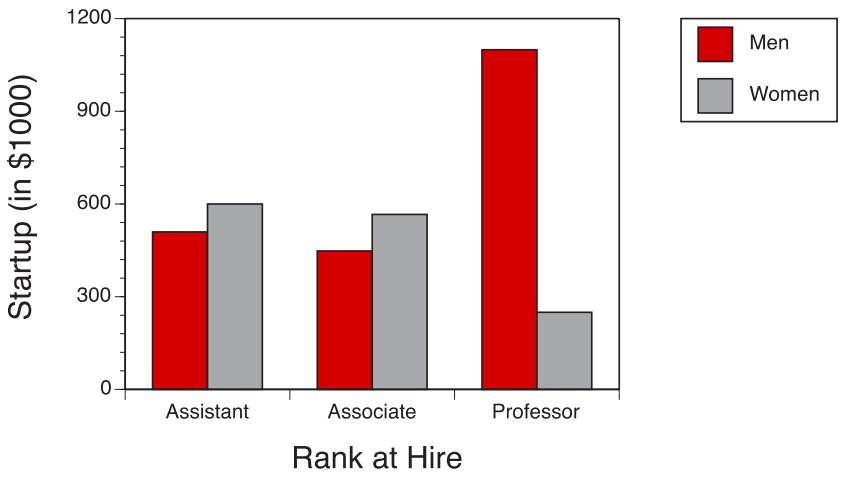
We examined these data as a function of department, rank, and gender, but that granularity provided low statistical power. We therefore aggregated data across units that *a priori* were judged to have similar markets for startup accounts.

Findings

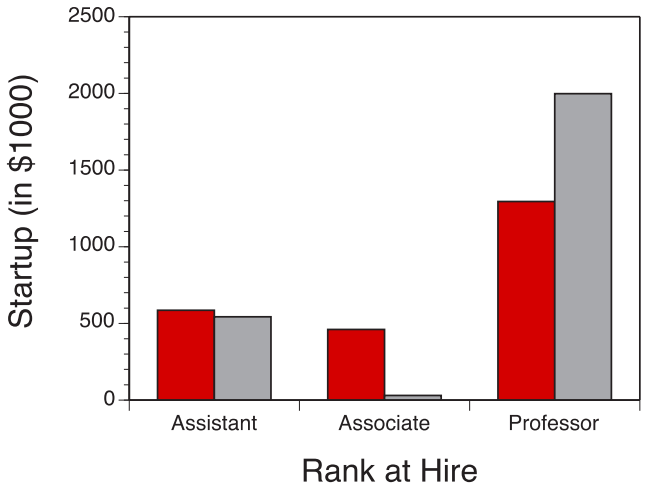
We provide example data[3] in Figure 1. There was no evidence for systemic gender bias: average startups for all Associate Professors were $303,153 for men and $265,205 for women; and for Professors men had startup accounts averaging $832,186 and women $809,362. A 2-way ANOVA on startup funds for Assistant Professors showed that most of the variation was accounted for by disciplinary differences, with no effect of gender on startup account size ($P>0.05$).

Figure 1. Startup funds for selected sets of STEM faculty. Note differences of scale across disciplinary groups, which contributes strongly to overall variance.

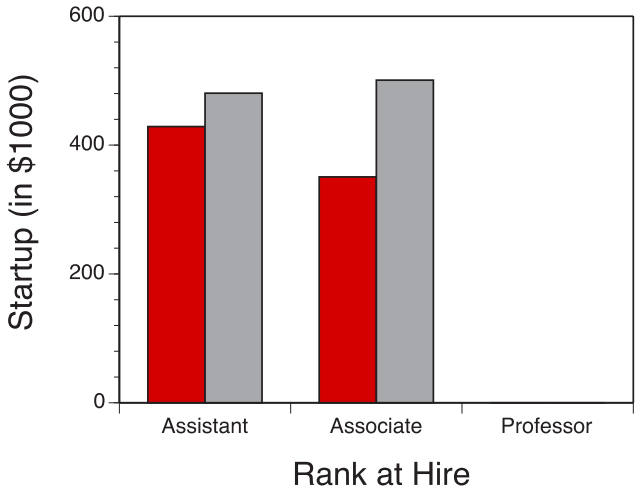
Engineering Group 2



NMS Group 1



Vet Med Basic



3. Lab Space

For many faculty, lab space is the most precious resource the university provides. Space is prized by experimentalists, who must house specialized equipment and provide bench and office space for students, postdocs, and technicians; in addition, ancillary spaces such as conference rooms and common equipment rooms contribute to faculty research productivity. Quality of lab space matters as well, and every department chair knows that being able to show prospective faculty members clean modern lab space is critical to successful recruitment. Assignment of lab space is typically the purview of the unit chair, and often involves negotiations throughout a faculty member's career, as research programs wax and wane.

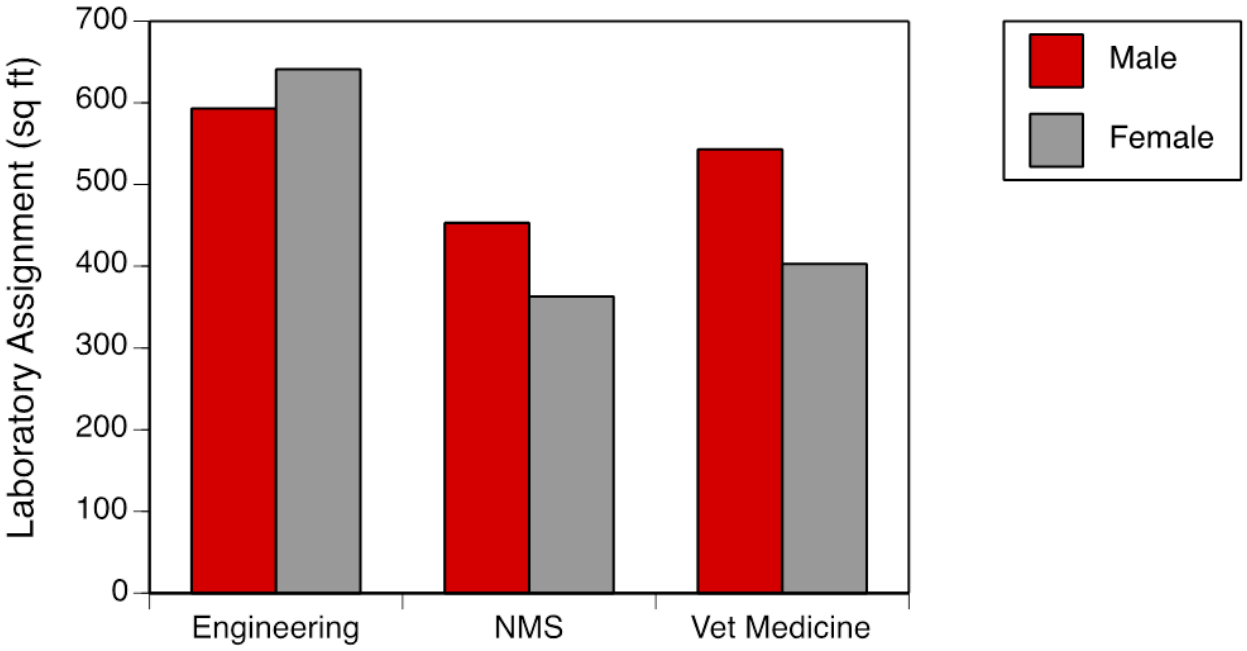
Methods

A global space audit was performed recently by the university's office of Facilities Operations and Development, but that exercise did not collect information on rank and gender of the assignee. Data from the Office of Research report square footage assigned to faculty with external funding; these data are used to negotiate Facilities & Administration rates, also known as overhead or indirect costs, with the federal government. Faculty without funding were not included in the Research database. We used the 2007 space census, and ignored shared space, equipment space, and office space, focusing solely on square footage of research laboratory. The Division of Natural and Mathematical Sciences had a comprehensive database they shared with us, but similarly complete data were not available from the other units. The available data were analyzed via a regression model with rank, gender, total external funding, and department as independent variables.

Findings

The data, summarized in Figure 2, show that men and women overall have similar-sized laboratories; indeed, our statistical analysis showed no significant effect of gender on the average size of lab space assigned to faculty.

Figure 2. Average lab space assignments within each college.



Our study points to some important gaps in available data. It would be desirable to analyze laboratory space assignments as a function of academic rank and amount of external funding; it also would be highly desirable to understand how access to shared equipment and office space for lab personnel are assigned within units. Furthermore, there are no accepted metrics for the *quality* of lab space, even though that matters greatly to faculty.

4. Teaching Assignments

Teaching is a core responsibility for tenure-track faculty, and assignment of teaching duties for individuals is handled at the department level. STEM teaching involves lectures, recitations and laboratory courses, as well as research training. In STEM disciplines, faculty use the "apprentice model" for overseeing undergraduate and graduate research. With that model, formal classroom teaching is but a fraction of how faculty work with students.

Methods

We examined data from the Registrar for teaching assignments in academic years 2007 through 2009 and considered four measures of teaching effort: the number of courses taught, the total number of credits hours taught, the number of contact hours associated with course load, and total number of students taught. We aggregated courses into four categories: lower-division undergraduate; upper-division undergraduate; beginning graduate; and graduate courses.

Separate regression analyses were conducted on the independent variables above for 1) all data; and 2) didactic classroom teaching only (e.g. excluding independent and research study classes, x93 – x99). We report here on the first of those analyses only.

Veterinary Medicine uses team-teaching in virtually all its offerings and only the "team leader" is reported to the Registrar; the Registrar's data for Veterinary Medicine failed to capture the intricacies of widespread team-teaching. We used data for 2008-2009 from the College office instead, which were reported as credit hours of time assigned.

We had data for three academic years for Engineering and NMS (2006-2008). After numerous discussions, the committee decided that two metrics (number of courses and number of Student Credit Hours generated) were the best measures for teaching loads within those units.

Findings

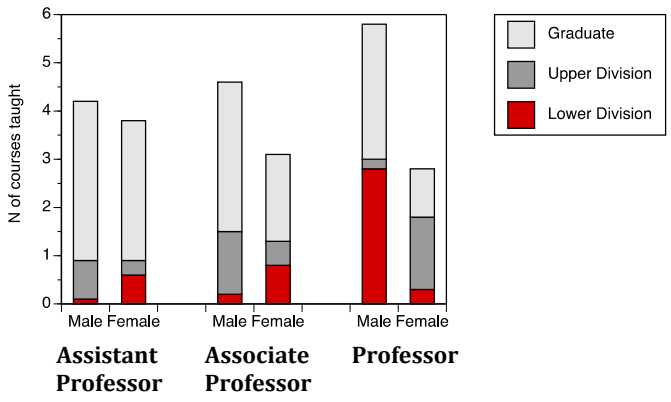
Summaries of teaching assignments for tenure-track faculty are given in Figure 3. Comparisons across colleges show fundamental differences in teaching responsibilities. Veterinary Medicine taught almost exclusively at the post-graduate level; Engineering faculty taught predominantly upper-division and graduate courses; and NMS faculty expended a greater proportion of their effort teaching lower-division courses. Thus, we focused on variation within colleges as a function of faculty rank and gender.

Overall, we found that faculty rank was an important predictor of teaching load in Veterinary Medicine and NMS, but not in Engineering. In Veterinary Medicine and NMS, Associate Professors generated more Student Credit Hours than the other ranks (Figure 3b). The only hint of gender differences in teaching assignments for any year and variable was the increased proportion of laboratory instruction assigned to women Associate Professors in Vet Med. No other measures of teaching load were significantly different between genders in any units.

While not reported here, we wish to comment on a major source of variation: faculty oversight of independent studies courses (x93 - x99). Faculty in STEM tend to have complete discretion accepting undergraduate researchers and graduate students to their groups; it is not unusual for lab size to vary over an order of magnitude among faculty within the same department. Our metrics for teaching workload failed to capture much of the nuance in faculty oversight of research activity.

Figure 3a. Number of Courses Taught per Faculty Member in the CEOS colleges (excludes independent study and research courses)

Engineering



Natural and Mathematical Sciences

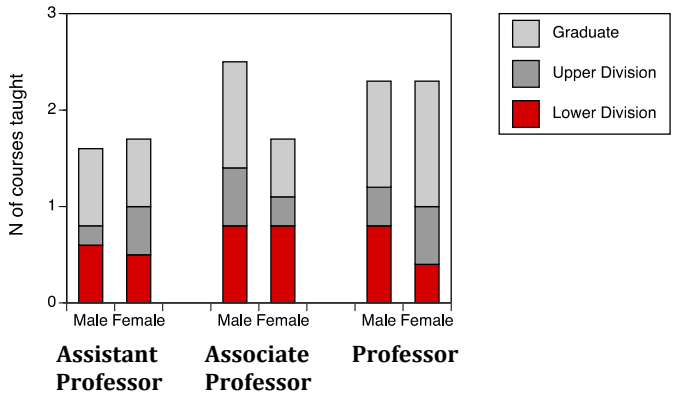
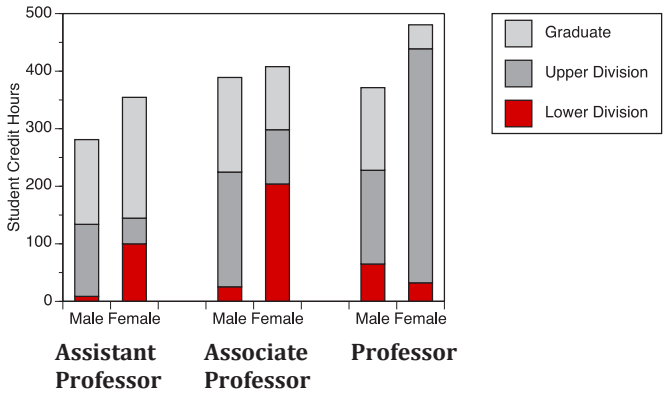
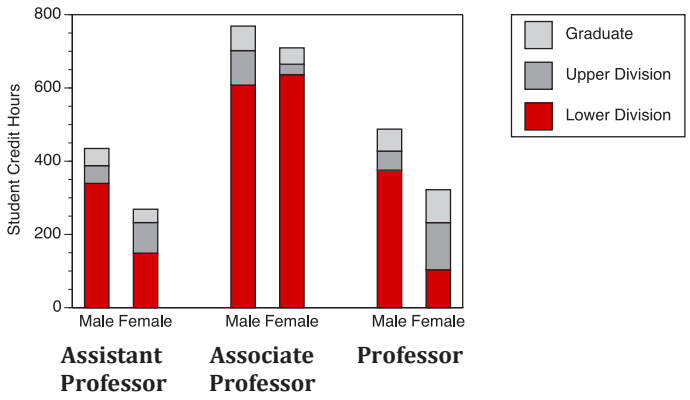


Figure 3b. Number of Student Credit Hours generated per Faculty Member in the CEOS colleges (excluding independent study and research courses)

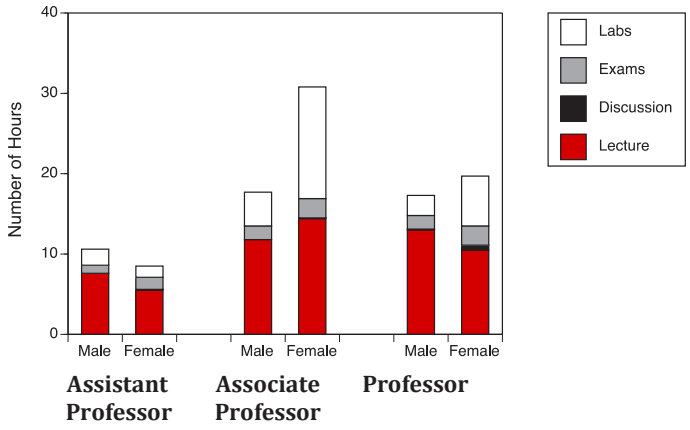
Engineering



Natural and Mathematical Sciences



Veterinary Medicine



Part II.
Faculty Survey

Background

Ohio State University is committed to supporting faculty retention and professional development. To further those aims, the University inaugurated a Faculty Survey in 2008 and committed to collecting data from that instrument every three years. The Faculty Survey consists of 75 questions regarding various aspects of University life and aims to yield information on faculty satisfaction with a range of work-related issues. All data were collected anonymously via a web interface.

General Approach

We had two cycles of the Faculty Survey data (2008 and 2011), provided by the Office of Institutional Research and Planning. We used the 2008 data as a baseline to compare with results from the second survey. We separated the data into two groups for comparison: the CEOS Colleges[4] and all other units.

The 2008 data include responses from 1357 faculty members of whom 289 were in the CEOS Colleges. The corresponding numbers for 2011 are 1383 and 324. The breakdown of the respondents by rank and gender is given in the table below. Note that faculty in the non-CEOS colleges taken together with those in the CEOS Colleges make up the total respondents.

Table 1. Response Rates to Ohio State Faculty Survey

	CEOS Colleges				Non-CEOS Colleges			
	2008		2011		2008		2011	
	Male	Female	Male	Female	Male	Female	Male	Female
Full Professor	138	16	151	26	268	97	277	107
Associate Professor	51	22	61	25	228	158	210	179
Assistant Professor	36	26	40	21	143	174	124	162
Total	225	64	252	72	639	429	611	448

The response rate for tenure track faculty across the University was 47 percent in both implementations of the Faculty Survey.

For this report we focus on responses to questions related to:

1. Access to Resources
2. Professional Relationships
3. Workload and Stress
4. Retention

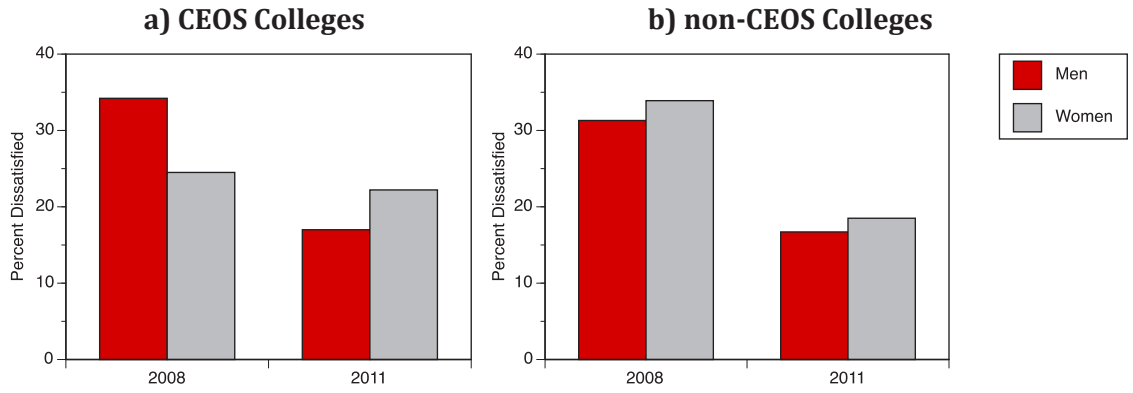
We report selected data for tenure-track faculty. Response rates differed among the three academic ranks of Assistant Professors, Associate Professors, and Professors. In most cases we pooled data across ranks, but for some of the variables the responses by Associate Professors are emphasized.

1. Access to Resources

Access to resources is a fundamental measure of equity for faculty. In STEM disciplines, the resources that affect career progress include laboratory space and the availability of startup funds. In Part I of this report, we show that access to resources in CEOS Colleges is equitable between men and women. Thus, we wished to understand whether perceptions of faculty matched reality. Accordingly, we first examine responses to questions on the Faculty Survey concerning satisfaction with various resources.

We found marked differences between 2008 and 2011 for satisfaction with startup funds (Figure 1). Across the University, dissatisfaction dropped between the two survey dates. All groups except women in CEOS colleges showed that dissatisfaction was cut in half across the three years. Dissatisfaction among CEOS women was lower in 2011 than in 2008 and the gender gap among CEOS faculty was erased.

Figure 1. Dissatisfaction with startup funds



The Faculty Survey asked several questions about access to space. With regard to office space, faculty indicated low levels of dissatisfaction across the board and in both years. By contrast, responses about laboratory space showed improvement in satisfaction between the two survey dates, especially in non-CEOS colleges. The percentages of faculty dissatisfied with laboratory space declined throughout the university, and a 2008 gender gap was erased in non-CEOS colleges by 2011. It appears that the vigorous construction and renovation schedule (including opening buildings the Biomedical Research Tower, Scott Labs, and the Physics Research Building) have had positive impact on faculty satisfaction with their lab space.

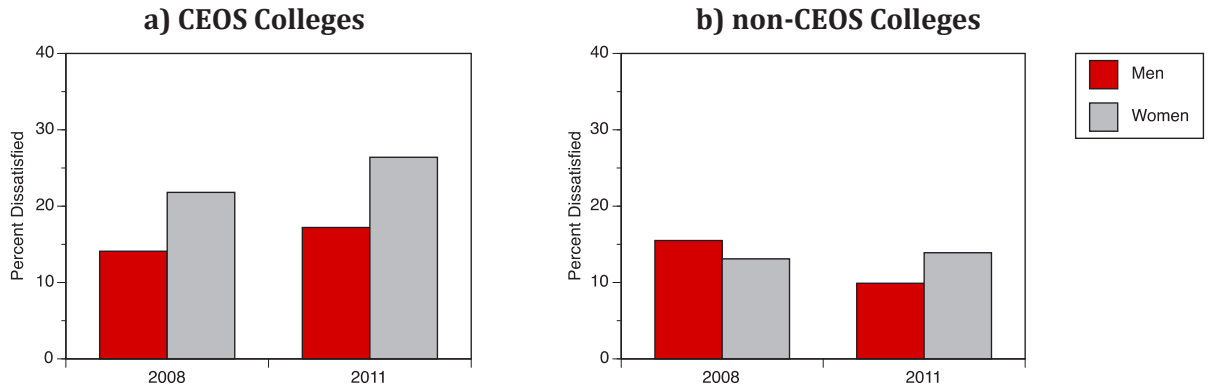
The lack of gender disparity in satisfaction with startup and lab space aligns well with the results in Part I of this report. That congruence lends credibility to other perceptions reported by faculty on the Survey.

2. Professional Relationships

We first examined responses to a question about *social relationships with colleagues*. Between 2008 and 2011, dissatisfaction among the men in CEOS colleges dropped from 22 percent to 16.4, while that among women started off at 28.8 percent and went up slightly. In the rest of the University, dissatisfaction levels were considerably lower: among the men, the percentage dropped from 15.9 to 12.9, and among the women it remained at 13.8 percent.

A complementary question asked about *professional relationships with peers* (Figure 2). Within the CEOS colleges, more women were dissatisfied with these relationships in both years than their male counterparts (Fig 2a). In other units (Fig. 2b), the level of dissatisfaction for men was slightly higher at 15.5 percent in 2008 and dropped to 9.9 percent in 2011. Over the same period, the women's responses outside the CEOS Colleges did not change.

Figure 2. Dissatisfaction with professional relationships



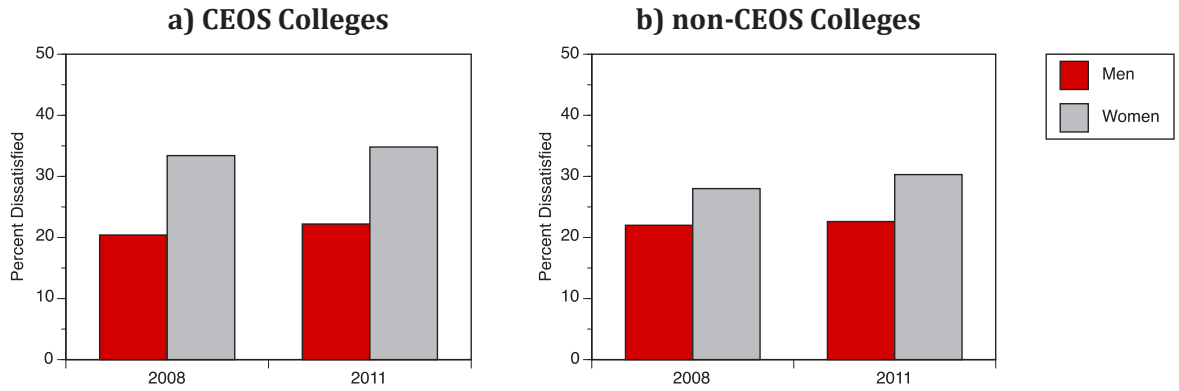
The survey queried faculty about the *competency of their colleagues*. In 2008, the dissatisfaction level among the men was 11.9 percent, which was slightly higher than the 7.8 percent among the women. That number did not change much for men in 2011 (11.2 percent), however, it went up to 13.9 percent for the women. The faculty in the non-CEOS colleges did not show a similar change.

Another question asked whether faculty felt *uncomfortable expressing their opinion* at faculty meetings. In 2008, more CEOS male faculty members (28.3 percent) were uncomfortable than their female colleagues (22.8 percent); by 2011 discomfort rose for women to 27.8 percent and remained approximately the same, at 29.3 percent, for men. Thus the gender gap has closed, without an improvement in the climate. By contrast, responses from non-CEOS colleges showed a larger gender gap for this question in both years. Concern about expressing opinions appeared to be less of an issue in CEOS colleges than in other units.

Other questions on the survey similarly asked about feelings of inclusion/exclusion. For a question on feeling *ignored in their departments,* 26.8 percent of both men and women faculty in CEOS colleges reported dissatisfaction in 2008. By 2011 those percentages increased to 34 percent of men and 31.4 percent of women.

The largest gender gaps in faculty satisfaction with relationships were found for questions regarding *informal networks* (Figure 3). In both rounds of the survey, more women than men reported feeling excluded from these networks in their departments. While the percentages in CEOS colleges (Fig. 3a) were slightly higher than elsewhere in the University (Fig 3b), a gender gap was universal for feelings of access to the networks of power within departments.

Figure 3. Dissatisfaction with exclusion from informal networks



There was a similar gender gap in perceived *opportunities for collaboration* in the CEOS Colleges. In 2008, 32.1 percent of the female faculty members were dissatisfied with those opportunities compared to 19.1 percent of men. Those percentages were comparable in 2011 (29.5 percent women and 20.4 percent men), showing a persistent gender gap in perceived collaboration opportunities.

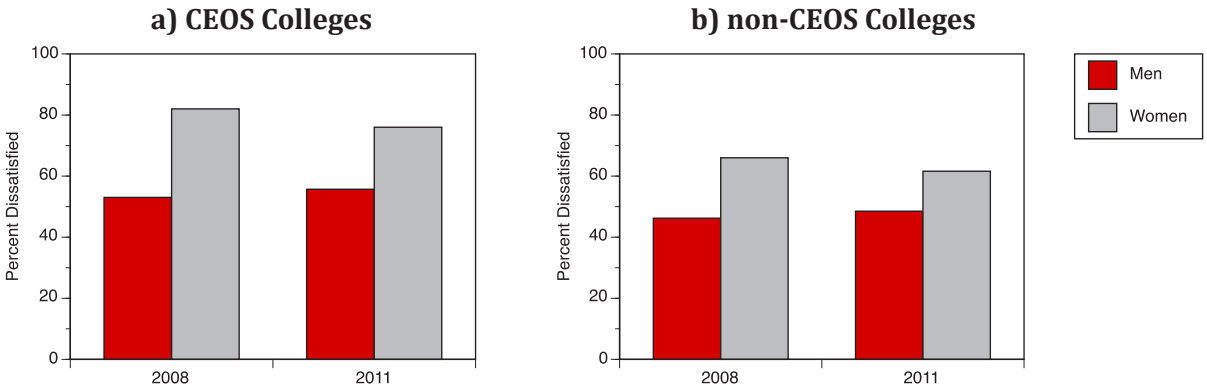
Finally, we examined relationships among faculty through the lens of access to mentoring. There was widespread dissatisfaction across the university with access to mentoring opportunities. About half of all faculty who responded to the survey expressed dissatisfaction, and we found gender gaps across the university that were exacerbated in CEOS colleges relative to other units.

3. Workload and Stress: Focus on Associate Professors

In general, faculty who held the rank of Associate Professor were less satisfied professionally than Assistant Professors or Professors. We disaggregated data by rank and found important patterns among Associate Professors for perceptions of stress and workload.

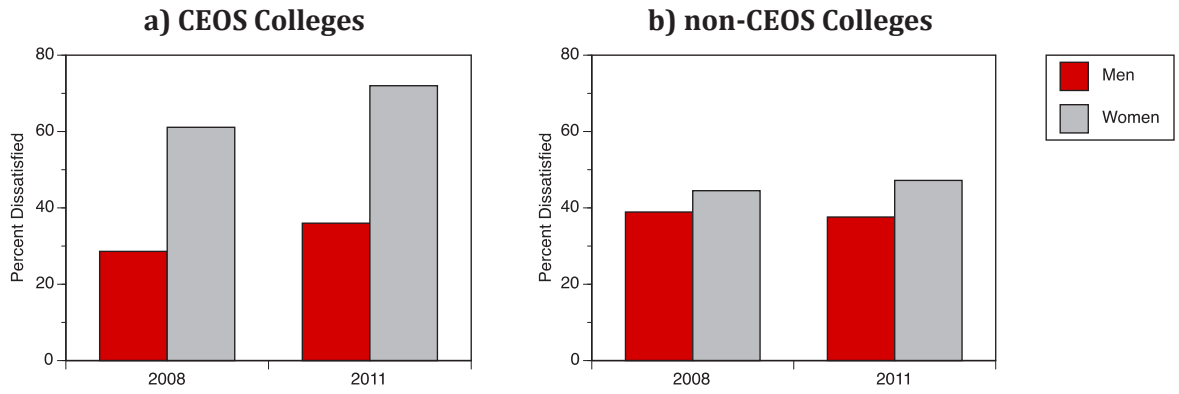
Perceptions of workload (Figure 4) showed nearly universal dissatisfaction among women faculty in CEOS colleges (note the scale in Figure 4). While half of all male faculty in CEOS colleges also expressed dissatisfaction with their workload, the gender gap was striking in both years (Fig. 4a). In non-CEOS colleges, female Associate Professors reported greater dissatisfaction than their male colleagues as well (Fig. 4b). This measure of stress was ameliorated for women somewhat by 2011, with the improvement greatest for women in CEOS colleges. Even so, three-quarters of CEOS women faculty felt stressed by their workload in 2011, which was higher than female colleagues in other colleges, and considerably higher than men throughout the university.

Figure 4. Dissatisfaction with a heavy workload for Associate Professors



Another source of stress for faculty derives from feelings of being under-appreciated. Figure 5 shows that in 2008, 61 percent of women Associate Professors in the CEOS colleges agreed with the statement "*I have to work harder than some of my colleagues do to be perceived as a legitimate scholar*." By 2011, 72 percent of women in CEOS colleges felt that way. Men faculty in the CEOS colleges likewise showed greater dissatisfaction in 2011 (36 percent) than in 2008 (28.6percent). By contrast, faculty in other units showed no appreciable change in their perceptions. Furthermore, a large gender gap for CEOS colleges (Fig. 5a) was not mirrored in other units (Fig 5b).

Figure 5. Feelings of needing to work harder for legitimacy (Associate Professors)



4. Retention

Ohio State has emphasized retention of talent, and thus the answers to two questions about retention are of keen interest. When asked whether the faculty member would choose a university career if they had it to do over, the vast majority expressed satisfaction with career choices: fewer than five percent said that they would not *want to be a professor*.

However, responses to the question "If you were to begin your career again, would you *still want to come to this institution?"* are troubling. The proportion of CEOS women faculty who said "no" to this questions increased from 11.7 percent in 2008 to 20 percent in 2011; the percentage of men in those colleges who answered "no" remained at 18 percent. By contrast, in 2008,16 percent of the women faculty in other units answered negatively and that number dropped to 14 percent in 2011. The men in non-CEOS colleges appeared happier (13.1 percent) in 2011 than they had been in 2008, when 19 percent said they would not want to come to this institution.

Summary

We were pleased to find that men and women faculty were equally satisfied with objective parameters of employment (salary, lab space, startup funds), results that dovetailed with our separate analysis showing those parameters in fact did not differ between male and female faculty in the CEOS colleges. Even so, striking differences in satisfaction with personal relationships, workload, and Ohio State as an employer suggest that men and women have different experiences in the workplace. In order to make continued progress attracting and retaining women faculty in STEM, we must examine the root causes of those differences, and identify ways to ameliorate negative experiences.

Recommendations

- Continued diligence by deans and chairs will be necessary to ensure that access to resources remains equal between their male and female faculty
- We recommend that deans and chairs in other colleges examine data on resource allocation to determine if gender gaps occur; should they uncover any patterns of disparity between men and women, special attention may be required to erase the gender gap
- Service represents a major responsibility for tenure-track faculty, yet it is not monitored or assessed in comparable ways across units. We suggest that deans and chairs consult with their faculty about how best to measure service loads; subsequent steps will entail analysis of the service data to look for patterns across ranks, departments, and genders.
- Men faculty, especially in STEM, report greater levels of satisfaction with their work environment than do their female colleagues. Academic leaders can help their female faculty by supporting their involvement in interdisciplinary teams, ensuring they receive appropriate mentoring, and fostering leadership development.
- Furthermore, deans and chairs can solicit assistance in studying departmental culture to identify patterns of behavior that impede retention of women faculty. The Academic Leader Series provides an important forum for leaders to learn about effective meeting leadership, structuring difficult conversations, addressing academic bullying, and other management skills.
- Project CEOS has collected many data on the cultural issues perceived by women faculty in STEM to be problematic. In response, we pioneered the concept of "action learning teams" for STEM departments. These teams include senior faculty and staff who identify important issues in their units and develop strategies for improving the culture via action. We urge other units to consider this mechanism to study local culture with a view to improving workplace satisfaction for all faculty.
- Women Associate Professors in STEM are particularly vulnerable to feeling job stress. Special programs to support their career development may be in order.

Notes

1. A comprehensive analysis, including the full range of data and results, is available at ceos.osu.edu
2. Veterinary Medicine, Engineering, and Natural & Mathematical Sciences
3. Full range of data and results available at ceos.osu.edu
4. Veterinary Medicine, Engineering, and Natural & Mathematical Sciences

Suggested Reading

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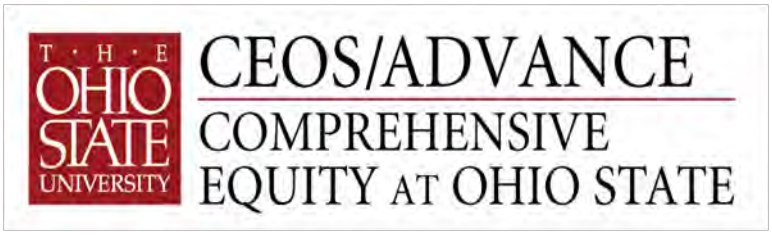

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Samantha Howe	Graduate Research Assistant
Darlene Saporu	Graduate Research Assistant
Leigh Anderson	Graduate Research Assistant

Women STEM Faculty at Ohio State: Resource Allocation and Department Climate

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