

## **Salary, space, and satisfaction: An examination of gender differences in the sciences**

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### **ABSTRACT**

How can universities be more successful in recruiting and promoting the professional success of women in their science-related departments? This study examines selected pieces of the puzzle by examining actual salary and space allocations to 282 faculty members in the science, technology, engineering and mathematics (STEM) and the social and behavioral science (SBS) departments of a research-active university. It also examines the perceived satisfaction of the faculty members related to equity and procedural justice for allocations of salary and space. The analyses of data collected suggest that the university studied is successfully reducing gender-based inequality. Other results suggest that perceived equity is an important influence on satisfaction, that the point at which procedural justice is emphasized may need to be re-examined, and that differing reactions by men and women can be difficult to predict. While the study shows that female and male faculty members tend to receive similar compensation and similar office and research space, and females even indicated a higher satisfaction with their space allocations, it points out that universities must go beyond equalizing the distribution of resources by paying careful attention to perceptions of equity and procedural justice and by striving to improve multiple aspects of their overall climate if they wish to recruit, retain and promote female faculty members.

Keywords: gender equity, salary, space allocation, satisfaction

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## INTRODUCTION

As professionals, university faculty members are concerned with receiving adequate and equitable rewards as well as the resources necessary to perform at a successful level. For this reason, the National Science Foundation requires that universities receiving funding under its ADVANCE program (intended to promote successful recruitment, hiring, and retention of women in STEM disciplines) analyze salaries and allocations of space of women and men holding faculty positions in targeted departments. Such analyses are considered necessary to insure that women and men are receiving comparable resources and support to develop in their careers. Aside from their instrumental value, “salary gains may be emphasized on a symbolic level by faculty as legitimation and recognition of their worth to their home institutions” (Zhou and Volkwein, 2004: 163). Similarly, the amount and quality of space and support made available to faculty members may reasonably be interpreted as an indication of the extent to which they are valued and respected by their institution.

Objective measures of salary and space allocations are crucial for understanding a university’s commitment to gender equity, but subjective perceptions also are important for understanding faculty members’ reactions to a university’s practices. For this reason, both actual allocations of salary and space within sixteen departments at a research-active university in the East-Central United States (referred to as the University) and the extent to which the University’s faculty members are satisfied with their access to adequate compensation and space are examined. The departments represented are the natural sciences, physical sciences, engineering, mathematics, statistics, social science and behavioral sciences (STEM and SBS departments). The extent (if any) to which women and men differ in their levels of satisfaction is a matter of particular concern.

## SUGGESTIONS FROM THE LITERATURE

The very large literature on job satisfaction indicates that one’s level of satisfaction often differs from the objective situation in which one works. Even when satisfaction is correlated with objective situations, relationships may be weak. Thus, Shepard and Hougland (1984) found in a study of workers in the plastics industry that workers’ incomes were significantly but only weakly ( $r = .12$ ) related to satisfaction with their pay. Consistent with a possible disconnect between objective situations and subjective reactions, some researchers have marveled that women often express higher levels of job satisfaction than men despite holding jobs that are “inferior” with respect to pay, autonomy, supervision, intrinsic interest, and opportunities for promotion (Hodson, 1989: 385; Clark, 1997; Volti, 2008: 209). Hodson has interpreted such findings in terms of *reference groups*—i.e., a tendency to compare one’s situation with others who are seen as having made similar investments (Stouffer et al., 1949). In support of this interpretation, Hodson (1989: 395-6) found that women’s job satisfaction was enhanced by being in “female-typed occupations where comparisons with male workers are not readily available.”

Such a situation, of course, would not occur among faculty members in contemporary American universities. Although many university academic departments have emphasized the recruitment of women and minorities in recent searches, most continue to employ a faculty that is reflective of a legacy of white male domination. This is particularly evident in the science, technology, engineering, and mathematics (STEM) departments and still somewhat evident in social and behavioral sciences (SBS) departments. As women in these departments compare their situation with others’ situations, the resources and rewards available to male colleagues will

be abundantly clear to them. In fact, some well publicized recent research suggests that women on the faculty of contemporary universities are less satisfied with their jobs than are their male counterparts. Responses from 9,512 pre-tenure faculty (Assistant Professors) at doctoral universities collected from annual surveys conducted by the Collaborative on Academic Careers in Higher Education (COACHE, 2010) indicate that female faculty members are less satisfied with many aspects of their jobs than are their male counterparts. The pattern was particularly strong among faculty in the social sciences. As was true in earlier studies, social comparisons may play a role. Barbara M. Fraumeni, an economist consulted by Jaschik (2010) concerning the COACHE findings, suggested that female economists often work in marginalized areas (e.g., gender and inequality issues). When they compare their careers with those of mainstream neoclassical economists, Fraumeni suggests that their work is likely to be unappreciated and that promotions may be delayed as a result.

Other recent studies have generated findings that differ in their consistency with the COACHE results. Analysis of data from a 1999 survey (NSOPF:99, sponsored by the National Center for Educational Statistics and National Science Foundation) of faculty members in the full range of private and public 2- and 4- year postsecondary institutions led Rosser (2004) to conclude that female faculty members are less satisfied than their male counterparts with several aspects of their jobs. She notes, “Female faculty members tend to be less satisfied with their advising and course workload, the quality of their benefits, job security, and salary levels than their male counterparts” (2004: 304). Other variables, including ethnic minority status and faculty rank, were not related to satisfaction, but, with respect to gender, Rosser contends that “This is the third national iteration on the status of faculty members in academe, and institutions still cannot seem to get it right” (2004: 304). Rosser’s analysis leads to conclusions similar to those suggested by the COACHE data, but an analysis of a later iteration of the same survey (NSOPF:04, conducted in 2004) produced more complex results regarding gender and satisfaction. An examination of *direct* effects in the 2004 survey by Martin (2011) indicated that gender was not significantly related to most aspects of satisfaction. The one exception was satisfaction with workload (females less satisfied). Although females received lower salaries than males, gender was not related to satisfaction with salary or benefits. Ultimately, however, Martin concluded that *indirect* effects did support her hypothesis that “women are less satisfied with their careers than men” (2011: 33). Specifically, “women were less satisfied with their workload and were less likely to agree that reaching is rewarded and consequently, had less career satisfaction” (2011: 28-29).

An analysis of data from full-time faculty members in science (including social science) and engineering fields who responded to the National Science Foundation’s 2003 *Survey of Doctorate Recipients* survey (Sabharwal and Corley, 2009) leads to different conclusions regarding gender and satisfaction. Before controls for other variables were introduced, men were more satisfied with their jobs than women, but men also were more likely to be employed in research-oriented universities, and, in most fields, to have jobs that emphasized research. When several demographic, institutional, and career-related factors were controlled in a regression analysis, the finding of lower satisfaction among females disappeared. “Within the science and health fields, men were significantly less satisfied than women. In the engineering and social science fields, there was no significant difference in satisfaction levels for men and women” (Sabharwal and Coley, 2009: 552). Their finding of higher to equal satisfaction among women occurred despite an indication from the same data set that “female faculty members earn lower

salaries than men across all disciplines” (Sabharwal and Corley, 2009: 553), leading the authors to speculate that women may emphasize intrinsic rather than extrinsic aspects of their jobs.

While the relationship between gender and satisfaction may not be as straightforward as some well-known studies have suggested, the literature does suggest rather clearly that orientations and perceptions of jobholders do have an important impact on their subjective reactions to their jobs. Thus, Sabharwal and Corley (2009) suggest that women faculty members may focus on different aspects of their jobs than men do, while Hodson (1989) suggests that women may invoke different social comparisons than men do. A considerable body of existing theory suggests that such comparisons are based on the idea that one’s rewards from work should be just and equitable. In his theory of distributive justice, Homans (1961) contended that people expected to be rewarded in a way that would be compatible with investments they had made. Perceptions of the adequacy of rewards depend in large part on the types of comparisons that they make. Thus, workers receiving a low level of pay may not be dissatisfied with the pay level unless they are in a situation allowing comparisons to individuals doing similar work but being paid more. If they become aware that their rewards are lower than those received by others who are making a similar effort, they are in a situation of *relative deprivation* (Stouffer et al., 1949; Davis, 1959).

Till and Karren (2011) have used these ideas to look specifically at satisfaction with pay. They contend that satisfaction with pay depends on employees’ conclusions about distributive justice, and that such conclusions will be based on social comparisons. Comparisons will lead them to conclude that their pay level is or is not *equitable*. Perceptions of equity will exist to the extent that individuals believe that their contributions are leading to rewards that are consistent with the rewards received by those with whom they are comparing themselves. Such comparisons may involve individuals inside or outside the organization that is employing them.

In addition to equity (based on Homan’s idea of *distributive* justice), Till and Karren also contend that satisfaction with pay will be based on *procedural* justice. Whereas *distributive* justice focuses on equitable *outcomes*, *procedural* justice refers to a perception that appropriate *processes* are in place. “This form of justice is based on the use of rules that help make decisions consistent, accurate, correctable, and unbiased” (Till and Karren, 2011: 45). For example, the existence of a formal appeals process may encourage a belief that appropriate processes are in place.

## HYPOTHESES

The foregoing summary of pertinent ideas from the literature suggests several hypotheses that can be tested while examining the experiences and perceptions of faculty members at the university.

**Objective Data.** Men traditionally have been privileged in university settings (as well as many other work settings). Even some very recent studies have shown that male faculty members are paid at higher levels than female faculty members. It is therefore predicted:

H1. Men will be paid at higher levels than women. These differences will survive the introduction of controls for discipline and academic rank.

H2. Men will receive more generous allocations of space than women. These differences will survive the introduction of controls for discipline and academic rank.

Satisfaction Data. Despite some inconsistencies in the literature, most studies indicate that women are less satisfied than their male counterparts on the faculties of contemporary American universities. It is therefore predicted:

H3. Men will be more satisfied with their salary than women.

H4. Men will be more satisfied with their space allocation than women.

The literature suggests that perceptions of distributive justice (i.e., equity) and procedural justice have an important impact on feelings of satisfaction. Following Till and Karren (2011), perceptions of equity and procedural justice only with respect to salary were examined. The predictions in this area are as follows:

H5. Perceptions that salary outcomes are equitable will be associated with higher levels of satisfaction with salary.

H6. Perceptions that just procedures are in place will be associated with higher levels of satisfaction with salary.

Although perceptions regarding equity and procedural justice are likely to have positive impacts on both men and women, the historically vulnerable position of women may make their considerations of equity and procedural justice particularly important. It is predicted that:

H7. The relationship between perceived equity and satisfaction with salary will be more powerful for women than for men.

H8. The relationship between perceived procedural justice and satisfaction with salary will be more powerful for women than for men.

## **METHODS**

### **Research Setting**

This study was conducted as part of an evaluation of a National Science Foundation ADVANCE grant received by a research-active university in the East-Central United States in order to inform the institution about allocation of resources and the perceptions of faculty about these allocations. The study was limited to one organization, and the authors acknowledge that multi-organization data is important to answer the hypotheses in a broader context. However, the multi-organization data would not explain what is going on at any one place. Furthermore, combining data from a variety of institutions may not reflect the situation at any one place, but rather blend to say nothing in particular. By utilizing data from a singular university, this study was used to inform the particular institution about the state of affairs related to salary and space allocations and to point out any possible situations that may need to be rectified.

### **Variables in the Analysis of Survey Data**

Measures of Satisfaction with Salary. The primary measure of satisfaction with salary is a Likert-format item (very dissatisfied to very satisfied) regarding respondents' level of

satisfaction or dissatisfaction with their current salary.<sup>1</sup> In addition, the survey also asked about satisfaction with opportunity to supplement one's salary and satisfaction with benefits. These three items were moderately correlated, but the researchers refrained from combining them into a scale because of a belief that they measured separate aspects of faculty compensation.

**Measures of Predictors of Satisfaction with Salary.** The hypotheses presented above dictated that several variables be included. Sex was measured by self-identification. Perceived equity of salary outcomes was measured by three Likert-format items involving comparisons of the respondent's salary with others on and off campus. The items were suggested by Till and Karren's (2011) work regarding the following aspects of distributive justice: individual equity, external equity, and internal equity. The items were combined into a scale with a Cronbach's alpha of .708. Perceived justice of the procedures leading to salary outcomes was measured most directly by three Likert-format items reflecting one's view of the effectiveness of the appeals process regarding salary and the thoroughness and candor of explanations about salary decisions. The items were developed because of the emphasis on similar issues by Till and Karren (2011). They were combined into a scale with a Cronbach's alpha of .844. In addition, an item reflecting the level of satisfaction or dissatisfaction with the process used in the respondent's department to determine faculty salary increases was included. The intention was that this item also reflected the perceived justice (i.e., procedural justice) of the salary process by focusing on the overall process in the unit of most important to the respondent.

Several variables not included in the hypotheses also were included in the analysis of satisfaction with salary because they are reflective of one's general status in the university. These include one attitudinal item—general level of satisfaction or dissatisfaction with one's job in the University, and more objective items involving the College of one's appointment, the general area of one's discipline (for Arts and Sciences faculty), and one's tenure status.

**Measures of Satisfaction with Space Allocation.** All respondents were asked questions about their office space, and those who reported that they had been assigned "laboratory or research space other than [their] basic office" were asked questions about their research space. In both instances, the questions involved Likert-format items (very dissatisfied to very satisfied) regarding respondents' level of satisfaction or dissatisfaction with location, amount of space, quality of furniture, quality of equipment, and general condition. The items were combined into scales for office space satisfaction (Cronbach's alpha = .880) and research space satisfaction (Cronbach's alpha = .852).<sup>2</sup>

**Measures of Predictors of Satisfaction with Space Allocation.** Because of the scarcity of a research literature regarding satisfaction with space allocations, the formal hypothesis on this subject involved sex. However, the researchers believed that several of the variables used to examine satisfaction with salary would also be useful for understanding satisfaction with space allocations. These included general satisfaction or dissatisfaction with one's job in the University, the College of one's appointment, the general area of one's discipline (for Arts and Sciences faculty), and one's tenure status. The researchers also posed several questions (summarized in Table 2) regarding respondents' opinions of the process involved in space

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<sup>1</sup> Summary statistics for this and other questionnaire items regarding salary may be found in Table 1 of the Appendix. The exact wording of questionnaire items is available by request.

<sup>2</sup> Summary statistics for these scales and other questionnaire items regarding space may be found in Table 2 of the Appendix. The exact wording of questionnaire items is available by request.

allocation. Taken together, it is contended that the items provide an insight as to whether respondents consider the space allocation process to reflect procedural justice.

### **Sources of Data**

Data for this article were obtained from three sources. Salary data for faculty members in the sixteen departments (STEM and SBS) at the university were obtained from Institutional Research. The years in rank data and the space allocation data for the same faculty members were provided by the individual dean's offices of the different colleges. Satisfaction data were obtained through the use of survey methodology. The survey consisted of Likert scale and open-ended questions regarding satisfaction with salary and space allocation. The questions were designed around collecting perceptions of equity and procedural justice (Till and Karen, 2011) related to salary and space allocations. The survey was distributed to the same tenured and tenure-track faculty from the selected sixteen departments within the university. All faculty members with administrative positions (except department chairs) were excluded from the analysis. This was done because some departments had a dean, associate dean, or director listed as a member of their department, while others did not. These salary data points for people with administrative positions skewed the particular department's salary numbers. The chairs were not excluded because every department had a chair.

Following an initial invitation to participate in the survey and two reminders (all sent through personalized e-mail messages with links to the survey), usable survey responses were received from 157 of 289 eligible respondents, for a response rate of 54.3 percent. Comparisons of survey respondents with official information on the characteristics of full-time tenure-eligible faculty members from targeted departments in Fall 2012 indicated that Arts and Sciences faculty, nontenured faculty, and women were comparatively likely to respond to the survey. Arts and Sciences faculty members represented 56.8 percent of the members of targeted respondents but 63.0 percent of survey respondents; nontenured faculty members represented 30.2 percent of the members of targeted respondents but 40.7 percent of survey respondents; and women represented 22.4 percent of the members of targeted respondents but 29.1 percent of survey respondents. Although it appears that the opportunity to respond to the survey may have been relatively attractive to those faculty members in positions traditionally associated with lower levels of privilege, differences were not so large as to necessitate weighting of responses.

### **Data Analysis**

The quantitative statistical analysis employed in this study is a multiple regression analysis, which allows us to use multiple control variables (predictors/covariates) to predict an outcome with the estimated effects of each control on the outcome adjusted for the estimated effects of the other controls (Lee, 2008: 7). Qualitative methods were applied to the open-ended responses from the survey. Responses were coded and reported based on themes.

## FINDINGS

### Results from Institutional Data

Institutional data sources were examined to study possible relationships between sex, salary, and space allocations. Table 3 (Appendix) examines results from the Spring 2013 semester regarding salary for full-time, tenured and tenure-track faculty members in targeted departments. Sex is not significantly related to salary. Academic rank and the department of one's appointment are the major predictors of salary. In particular, being appointed to an Engineering department carries a distinctive advantage. Women are more likely to hold Assistant Professor appointments (66.7% in Engineering; 50% in Arts and Sciences) and less likely to hold Full Professor appointments (0% in Engineering; 15% in Arts and Sciences) in Engineering, so results in Engineering only (Table 4 (Appendix)) were examined. Males in Engineering are shown to have an advantage regarding salary when academic rank is excluded from the analysis, but the relationship disappears when rank is included. Within Arts and Sciences, sex is not significantly related to salary whether or not rank is included in the analysis (results available by request).

Space allocations, as measured by the number of square feet allotted to an individual faculty member, did not vary by sex. This was determined by regression analyses for faculty members in each College. For each College, regressions were run for all faculty members and for those with funding only. Within Engineering, higher academic rank carries an advantage. Results for sex are not significant, but males apparently receive slightly less space than do females (Tables 5 and 6 (Appendix)). Within Arts and Sciences, higher academic rank carries an advantage. Most departments are disadvantaged in space allocation relative to the reference department of Biology, but the disadvantage is particularly severe for those departments that make little use of laboratories. Sex is not significantly related to space allocations, but males may tend to have some small advantage among faculty members with funding (Tables 7 and 8 (Appendix)).

### Results from Survey Data

Zero-Order Correlations. Table 9 (Appendix) shows that sex is one of the few variables not to be correlated with satisfaction with one's current salary, though it is modestly correlated with satisfaction with benefits. Variables with particularly strong correlations with salary satisfaction include perceived equity, general job satisfaction, and satisfaction with the department process used to determine salary increases. Perceived justice, having tenure, and being appointed in Engineering are correlated at more modest levels. Working in the social and behavioral sciences has a modest negative relationship with salary satisfaction.

Table 10 (Appendix) shows that most of the proposed predictors of satisfaction with space allocations are correlated at a moderate level with both office space and research space satisfaction. Tenure status is the only variable with no relationship with space allocations decisions. Females are shown to be more satisfied than males with research space and, to a lesser extent, office space. Participation in space allocation decisions, understanding space allocation decisions, and satisfaction with space allocation decisions are the strongest predictors of satisfaction with office space. Satisfaction with space allocation decisions, having a faculty appointment in Engineering (negative relationship), working in the social and behavioral

sciences, considering space allocation decisions to be consistent, and general satisfaction with one's job at the university are the strongest predictors of satisfaction with research space.

**Regression Results.** Satisfaction with one's current salary (Table 11 (Appendix)) as well as satisfaction with two other indicators of financial well-being—opportunity to supplement one's salary and benefits—were examined. Results for satisfaction with current salary partially mirror the relationships with actual salary described in Tables 3 and 4 (Appendix). Having tenure and being appointed to an Engineering position are both associated with satisfaction. However, several attitudinal variables may be more important predictors. A belief in equitable outcomes is shown to be particularly important. In addition, general satisfaction with one's job at the University is mirrored by salary satisfaction. To a lesser extent, satisfaction with department process is associated with salary satisfaction. Sex is not a useful predictor for satisfaction with current salary.

The survey examined two issues that go beyond one's basic salary—satisfaction with opportunity to supplement one's salary (Table 12 (Appendix)) and satisfaction with benefits (Table 13 (Appendix)). Table 12 (Appendix) shows that sex is a significant predictor of satisfaction with opportunity to supplement one's salary. Women tend to be more satisfied than men with such opportunities. Satisfaction with department process is associated with higher satisfaction, while being in the social and behavioral sciences is associated with lower satisfaction. Both of these results are consistent with results for basic salary (Appendix Table 11). Of the variables in the model, sex is the only significant predictor of satisfaction with benefits. Women tend to be more satisfied than men.

Zero-order correlations suggested that sex might be a major predictor of satisfaction with space allocations and quality, but that suggestion is not supported by the regression analyses. With respect to office space, being in the mathematical and statistical sciences is significantly and negatively associated with satisfaction. No other predictor in the model is significant (Table 14 (Appendix)). Satisfaction with research space (Table 15 (Appendix)) is significantly and positively predicted by overall satisfaction with the space allocation process and a belief that space allocation decisions are consistent.

Tables 16 - 18 (Appendix) summarize differences between men and women regarding satisfaction with three key outcomes—current salary (Table 16 (Appendix)), office space (Table 17 (Appendix)), and research space (Table 18 (Appendix)). Table 16 (Appendix) shows that, while the College of one's faculty appointment is the single most important predictor of salary satisfaction, perceived equity, appointment in a discipline outside the social and behavioral sciences, and satisfaction with the department process used to decide salary increases are important predictors for men. Perceived equity is a significant predictor of salary satisfaction for women, but it is far more important for men.

Results regarding satisfaction with office space (Table 17 (Appendix)) and research space (Table 18 (Appendix)) are similar for women. In both cases, satisfaction with space allocation decisions and perceived consistency of space allocation decisions are significant predictors. Neither variable was a significant predictor of space satisfaction for men. Men are more satisfied with their office space if they are working outside the mathematical and statistical sciences (Table 17 (Appendix)). No variable significantly predicts men's satisfaction with research space (Table 18 (Appendix)).

## Responses to internal salary comparison Likert and open-ended questions

The survey contained many questions that were summarized above, however there were two questions which also gave an opportunity for open-ended responses. Faculty members were asked to compare their salaries to their peers in two ways. The first way described below was an internal comparison with their peers within the institution. Their perceptions were collected and their responses were categorized.

On the survey, after being asked to “consider faculty members in your discipline and similar disciplines at <institution>”, faculty were asked the question, “When you compare your base salary to the base salaries that you believe that faculty members whose seniority and professional performance are generally equivalent to yours are receiving, would you characterize your personal base salary as: much lower than theirs, somewhat lower than theirs, about the same as theirs, somewhat higher than theirs, or much higher than theirs.” There were 157 respondents to this question, and 141 could be classified by sex—100 males and 41 females. Their classified responses can be seen in Table 19 (Appendix). It is interesting to note that 45% of males and around 51% of females thought that their salaries were either much lower or somewhat lower than other faculty members whose seniority and professional performance is equivalent. While only 10% of males and no females responded that their salary was somewhat higher than their peers, no one thought their salary was much higher than their peers. Many in both groups, male and female respondents, agreed that their salary were about the same as their peers.

As a follow-up question for respondents who thought their salaries were lower than their peers at the institution, faculty members were asked “Why do you think your salary is lower than that of comparable colleagues at <institution>?” Fifty faculty members who could be classified by sex responded (32 males and 18 females). The 43 responses that could be categorized appear in Table 20 (Appendix). The comments were divided into six main categories, university-level problems, salary differences between units of the university, department-level problems, personal history, lack of recognition of personal contributions, and personal shortcomings. Most of the comments fell into the category of university-level problems with 30% of male and 40% of the female respondents making comments about salary compression, inadequate raises, and a flawed evaluation process. One faculty member explained things very well by saying “Salary raises for promotion and merit are awarded as a percentage of the faculty member's starting salary. Faculty hired more recently were awarded higher starting salaries in order to be competitive with other institutions. Faculty recently hired as Assistant Professors currently have approximately the same salary that I have as an Associate Professor with 7 years of service including merit raises that I have received in prior years. Merit raises have been anemic at <institution> for many years.”

The second most common type of comment fell in the category of lack of recognition for personal contributions, with 24% of the male and 20% of the female responses in this category. Salary differences between units at the university was the third most popular response category (21% male and 20% female) with faculty acknowledging that disciplines and even colleges account for differences in salary. One faculty member commented by saying, “My discipline is seen as being characterized by more of a glut of job-seekers, versus other related disciplines where there is not as much demand. Therefore the College when hiring me felt they could somewhat 'lowball' my salary offer.”

There were respondents from each sex in each of the categories listed except the category of department-level problems and there were only 6% of the male responses in this category.

One faculty member in this category pointed out that in his situation it was his perception that the reason his salary was lower was due to “A very unfair series of salary raises only to selected individuals by a previous chairman of my department for seven long years. At the moment merit raises are allocated very fairly; our current chair is very fair. However, many of us have a large gap accumulated from previous years.”

Several comments from female respondents express their perceptions of why their salaries are lower, “My salary is increased when it becomes so out of proportion to others at my same rank (particularly men at same level as me). So that says that I am usually at the bottom of the pool. It's only when it becomes grossly inequitable that it must then be adjusted.” And “When I was hired, my starting salary was much lower than my colleagues hired after me. Even though I had a "catch up" raise a few years back, it's still frustrating to me that my base salary is so low.”

### **Responses to external salary comparison Likert and open-ended survey questions**

Faculty members were also asked to compare their salaries to their peers outside the institution. Their perceptions were collected and their responses were categorized. On the survey, faculty were asked the question, “When you compare your base salary to the base salaries that you believe that faculty members at other universities whose seniority and professional performance are generally equivalent to yours are receiving, would you characterize your personal base salary as: much lower than theirs, somewhat lower than theirs, about the same as theirs, somewhat higher than theirs, or much higher than theirs?” There were 138 respondents to this question and their responses are in Table 21 (Appendix). It is interesting to note that around 81% of males and around 74% of females thought that their salaries were much lower or somewhat lower than faculty members whose seniority and professional performance is equivalent at other universities. Only 2% of males and no females responded that their salary was somewhat higher than their peers. A relatively small percentage of respondents in both groups (17% males and 26% females) agreed that their salaries were about the same as their peers.

As a follow-up question for respondents who thought their salaries were lower than their peers at other institutions, faculty members were asked “Why do you think your salary is lower than that of comparable colleagues at similar universities?” Eighty-four faculty members responded to this question, of these 79 could be classified by sex (55 males and 24 females). Their categorized responses appear in Table 22 (Appendix). The comments were categorized in four main categories, state-level factors, university financial factors, university internal practices, and external factors. Most of the comments fell into the university financial factors category, with 44% of male responses and 59% of female responses. In this category faculty members pointed out things such as low starting salaries, low or no raises, inflated administrator and coaches salaries, expensive benefits, low endowments, low tuition, and being a low profile department at the university as their perceptions of why their salaries are lower than their peers at comparable universities. One faculty member discussed his frustration with the starting salaries and the impact it may have on the institution by saying, “A historical and somewhat willful effort on the part of <the university> to ignore salary trends in the US. This purposeful effort to ignore the truth about the cost of living in <university town> and to consistently lowball during hiring continues to damage the ability to recruit the best and brightest, and in the long term makes it difficult to retain good faculty.”

The next most popular response category was state level factors, with 29% of male and 41% of female responses in this category. Responses in this category pointed out that their perceptions were that the state had little money to support the institution, that all salaries in the state were low, and that higher pay for university professors was not a state priority. They also countered this point with saying that the cost of living in the state was also relatively low. One faculty member summarized her perceptions by saying “<state> is a poor state. I'm sure the legislature does what it can, but the budget is limited. Other states have larger budgets, so they can pay state employees more money. What we earn is probably proportional to others given the budgets.”

The other two categories contained only male responses. Seventeen percent of male responses cite university internal practices as the reason for their lower salaries and 10% of male responses cited external factors (such as difference among universities and the university not having a high enough profile) as the reason. Female responses did not contribute to these two categories. It appears that males and females both perceive that there are problems at the state-level and with universities financial factors, but male respondents were more ready to point out university internal practices and external factors as being the reasons their salary was lower than colleagues at other comparable institutions.

## **SUMMARY AND DISCUSSION**

Official data and results from a survey of faculty members in targeted STEM and SBS departments in a research-active university in the East-Central United States were used to examine both the distribution of salaries and space and the degree of satisfaction or dissatisfaction regarding salaries and space. The study is based on concerns both that women and men receive equitable shares of resources and also that they consider the distribution of resources appropriate.

Institutional data indicated that neither salary nor space allocations varied by sex. Major predictors of salary were academic rank and the department of one's appointment. Higher academic rank does appear to be associated with advantageous space allocations.

Survey results indicated sex is not a useful predictor of satisfaction with one's current salary, but women tend to be more satisfied than men with opportunities to supplement one's salary and with benefits. A belief in equitable outcomes is shown to be a particularly important predictor of satisfaction with one's current salary.

With respect to office space, being in the mathematical and statistical sciences is significantly and negatively associated with satisfaction. Satisfaction with research space is significantly and positively predicted by overall satisfaction with the space allocation process and a belief that space allocation decisions are consistent. Zero-order correlations suggested that sex might be an important predictor of satisfaction with space, but that suggestion was not supported by the regression analyses.

### **Implications for Hypotheses**

For the most part, the findings are inconsistent with the hypotheses. At times, the inconsistencies suggest that the university studied is successfully reducing gender-based inequality. Other results suggest that perceived equity is an important influence on satisfaction,

that the point at which procedural justice is emphasized may need to be re-examined, and that differing reactions by men and women can be difficult to predict.

H1. Men will be paid at higher levels than women. These differences will survive the introduction of controls for discipline and academic rank.

Hypothesis 1 was not supported by the institutional data. When all tenured and tenure-track faculty from the targeted departments are considered, sex is not significantly related to salary level. The analysis shows that males in Engineering receive higher salaries than women when academic rank is excluded from the analysis, but the relationship disappears when rank is included. Although the domination of upper ranks by men continues to be a factor, it appears that the university examined for this study has been more successful than many in speaking to gender-based salary disparities.

H2. Men will receive more generous allocations of space than women. These differences will survive the introduction of controls for discipline and academic rank.

Hypothesis 2 was not supported by the institutional data. Using a measure of number of square feet allotted to individual faculty members, sex was not a significant predictor of space allocations. As was true with salary, an examination of space allocations suggests that the University that is the site of this study appears to have had some success in overcoming a history of male privilege.

H3. Men will be more satisfied with their salary than women.

Hypothesis 3 was not supported by the survey results. Sex is not significantly related to satisfaction with one's current (base) salary. Sex is related to satisfaction with opportunity to supplement one's salary and satisfaction with benefits, but the relationships are the opposite of those predicted by hypothesis 3 in that women are more satisfied.

H4. Men will be more satisfied with their space allocation than women.

Hypothesis 4 is not supported by the survey results. Zero-order correlations suggested that the hypothesis might be thoroughly refuted by survey respondents, but regression results were less decisive in that sex did not survive as a significant predictor. Neither findings in the opposite of the predicted direction nor findings that approach zero are supportive of the hypothesis, but it cannot be said definitively that women defied the predictions by being more satisfied with space than men are. It should be noted that the measures of space satisfaction (for office space and research space) used went beyond the amount of space allocated (which is the focus of institutional data as well the specific wording of Hypothesis 4) and also dealt with perceived quality of the space and its furnishings and equipment. However, the introduction of additional issues does not seem to have reduced the magnitude of any relationship between sex and space. For office space, the relationships between sex and quality of equipment ( $r = .231$ ) and general condition ( $r = .230$ ) were as strong as the relationship between sex and amount of space ( $r = .230$ ). For research space, the relationship between sex and satisfaction with amount of space ( $r = .229$ ) actually was the weakest of five satisfaction measures. Lackluster regression

results notwithstanding, it appears that women at the university being studied are at least holding their own with respect to space.

H5. Perceptions that salary outcomes are equitable will be associated with higher levels of satisfaction with salary.

Consistent with Hypothesis 5, perceived equity is associated with satisfaction with one's salary. Equity is not associated with satisfaction with opportunity to supplement one's salary or satisfaction with benefits, but basic salary is most central to the concerns underlying this analysis.

H6. Perceptions that just procedures are in place will be associated with higher levels of satisfaction with salary.

The "Justice" scale suggested by Till and Karren's (2011) work is not related to satisfaction with salary or related monetary issues. However, another item that arguably reflects a just process (in the sense of procedural justice) fares better. Satisfaction with "the process used in your department to determine faculty salary increases" is related to salary satisfaction and satisfaction with opportunity to supplement one's salary. Following the lead of Till and Karren (2011), the "Justice" scale reflects opportunities to appeal salary decisions as well as the thoroughness and candor of explanations received about salary increases. While such matters are important, they occur at the conclusion of the salary process. The findings in this paper suggest that the more important process may be earlier points in an unfolding process.

Because the organizational literature on equity and justice has developed in the context of salary, Hypotheses 5 and 6 were not supplemented with hypotheses about the effects of perceived equity and justice on satisfaction with space. The inherent difficulty of comparing one's space allocations with those received by others dissuaded us from attempting to develop items regarding the equity of space allocations, but items that are reflective of aspects of procedural justice were developed—"How dissatisfied or satisfied are you with the procedures through which space allocation decisions are made?" and extent of agreement or disagreement that "Decisions about space allocation in my department are consistent regardless of who the Chair may be." Neither item was related to satisfaction with office space (Appendix Table 14), but both were related to satisfaction with research space (Appendix Table 15). Because research space can be a contested issue, the findings suggest that those wishing to understand reactions to research space allocations should be sensitive to questions of distributive justice. Results broadly related to the final two hypotheses lend credence to the suggestion that procedural justice may be important for understanding reactions to space allocations.

H7. The relationship between perceived equity and satisfaction with salary will be more powerful for women than for men.

H8. The relationship between perceived procedural justice and satisfaction with salary will be more powerful for women than for men.

Satisfaction with one's base salary provides the most direct test of Hypotheses 7 and 8. Neither is supported by the male-female comparison in Table 16 (Appendix). Perceived equity

is related to salary satisfaction for both men and women, but, contrary to the prediction of Hypothesis 7, the relationship is stronger for men than for women. Consistent with the results in Table 11 (Appendix), the “Justice” scale is not related to satisfaction with current salary for men or women, but satisfaction with department process is related to salary satisfaction for men. To the extent that differences exist between men’s and women’s reactions, perceived equity and procedural justice appear more important for men than for women. Other monetary issues (satisfaction with opportunity to supplement salary and satisfaction with benefits) also fail to provide support for Hypothesis 7 or 8. Men and women fail to differ in their responses to perceived equity or procedural justice for either outcome (results available by request).

Women respond positively to satisfaction with space allocation decisions and consistency of space allocation decisions for both office space and research space (Tables 17 and 18). The variables are not significantly related to men’s satisfaction with either office or research space. While the results do not provide support for Hypothesis 8 regarding salary, procedural justice may well be important as women responded to the questions related to space allocations.

## CONCLUSION

While the concern for adequate and equitable space and salary allocation may be at the forefront of many faculty members minds, this study of STEM and SBS departments at a large research-active university shows that, at least in their case, things have moved in the right direction. Female and male faculty members are shown to receive similar compensation and similar office and research space. Females even indicated a higher satisfaction with their space allocations. Males were more pointed and outspoken in their comments on why their salaries were lower than colleagues within and outside of their institution, with the average male comment 40 words in length and the average female comment 27 words in length. The numbers and the comments seem to tell a positive story of equity within the institution. However, the reason that the university was able to secure an NSF ADVANCE grant in the first place was that it historically has had a difficult time recruiting, retaining, and promoting females in the STEM disciplines and somewhat in the SBS disciplines.

The responses from 9,512 pre-tenure faculty (Assistant Professors) at doctoral universities collected from annual surveys conducted by the Collaborative on Academic Careers in Higher Education (COACHE, 2010) indicate that female faculty members are less satisfied with many aspects of their jobs than are their male counterparts. Judy Jackson (2004) in her article titled “The Story Is Not in the Numbers: Academic Socialization and Diversifying the Faculty” also points out that the absence of significant differences between white men and other academic groups, leads us to ask the question about what other factors need to be considered. While Jackson is talking about productivity of engineering faculty in her article, her suggestion applies to this case as well. If salaries and space are very similar, then what other factors must be considered that affect the recruitment, retention, and promotion of females in STEM and SBS departments? Jackson (2004: 79) states, “Findings on qualitative measures (such as personal experience and climate issues) showed differences by gender and race in the quality of faculty experience. When considered along with the quantitative measures, the qualitative data suggest the need for no less than a thorough examination of faculty socialization and departmental, if not institutional, culture.”

While the numbers and perceptions tell a positive story of equity, a university must investigate other factors that affect females coming to the institution and moving through the

ranks. Much of the work of the ADVANCE team at the institution is focused on changing the climate in the departments (which were typically male dominated) and at the institution as a whole. The team is also encouraging mentoring strategies within the departments and implementing external mentoring strategies where female and minority faculty members' work with a mentor within their discipline outside the university. At the university level, the team has also facilitated the establishment of new policies and procedure that enhance the work environment for women. Administrators at the university realize that the success of females at the institution is not solely based on providing them with equitable salary and space. The research contained in this article is a necessary first step when an institution is examining gender equity, but to successfully recruit, retain, and promote women in STEM and SBS departments there is more work to be done.

## ACKNOWLEDGEMENTS

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**APPENDIX**

| Table 1: Summary Statistics for Salary Variables    |                |                |       |       |
|---|----------------|----------------|-------|-------|
|   | # of Responses | Possible Range | Mean  | SD    |
| General Job Satisfaction                            | 153            | 1-5            | 3.562 | 1.056 |
| Satisfaction with department process                | 155            | 1-5            | 3.161 | 1.137 |
| Perceived equality                                  | 140            | 3-15           | 6.857 | 2.148 |
| Perceived justice                                   | 126            | 3-15           | 8.659 | 2.890 |
| Faculty appointment in Engineering                  | 162            | 0-1            | 0.333 | 0.473 |
| Discipline in mathematical and statistical sciences | 162            | 0-1            | 0.130 | 0.337 |
| Discipline in social and behavioral sciences        | 162            | 0-1            | 0.216 | 0.413 |
| Tenured   | 145            | 1-2            | 1.407 | 0.493 |
| Female  | 141            | 0-1            | 0.291 | 0.456 |
| Satisfaction with current salary                    | 157            | 1-5            | 2.796 | 1.164 |
| Satisfaction with opportunity to supplement salary  | 157            | 1-5            | 3.484 | 1.119 |
| Satisfaction with benefits                          | 157            | 1-5            | 2.847 | 1.199 |

| Table 2: Summary Statistics for Space Variables     |                |                |        |       |
|---|----------------|----------------|--------|-------|
|   | # of Responses | Possible Range | Mean   | SD    |
| General Job Satisfaction                            | 153            | 1-5            | 3.562  | 1.056 |
| Understanding of space allocation decisions         | 144            | 1-4            | 2.389  | 0.997 |
| Satisfaction with space allocation decisions        | 143            | 1-5            | 3.056  | 1.067 |
| Participation in space allocation decisions         | 144            | 1-5            | 2.854  | 1.223 |
| Consistency of space allocation decisions           | 142            | 1-5            | 2.972  | 1.091 |
| Faculty appointment in Engineering                  | 146            | 0-1            | 0.333  | 0.473 |
| Discipline in mathematical and statistical sciences | 162            | 0-1            | 0.130  | 0.337 |
| Discipline in social and behavioral sciences        | 162            | 0-1            | 0.216  | 0.413 |
| Tenured   | 145            | 1-2            | 1.407  | 0.493 |
| Female  | 141            | 0-1            | 0.291  | 0.456 |
| Office space satisfaction                           | 144            | 6-25           | 19.458 | 4.183 |
| Research space satisfaction                         | 91             | 5-25           | 18.220 | 4.623 |

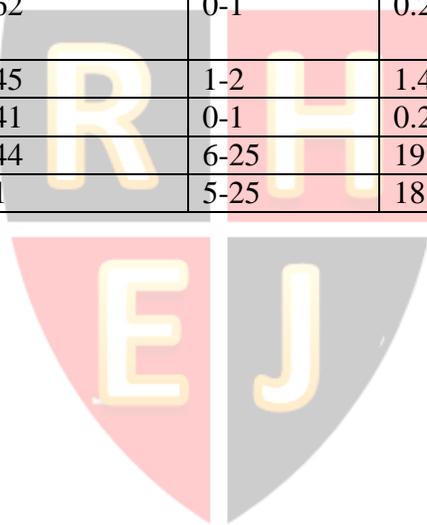


Table 3. Regression Results for Actual Salary  
(N=282)

|   | Estimated Coefficient | Standard Error | t-value  |
|---|-----------------------|----------------|----------|
| Constant  | 63939.17              | 3412.52        | 18.74*** |
| Years at Rank   | -210.63               | 389.96         | -0.54    |
| Years of Service  | 229.42                | 396.71         | 0.58     |
| Associate   | 9860.95               | 2790.30        | 3.53***  |
| Full  | 35377.98              | 6175.71        | 5.73***  |
| Chemical Engineering  | 25340.10              | 7297.66        | 3.47***  |
| Chemistry   | 819.27                | 4903.91        | 0.17     |
| Civil and Environmental Engineering   | 23086.53              | 6107.86        | 3.78***  |
| Computer Science & Electrical Engineering                                   | 24778.77              | 4561.70        | 5.43***  |
| Geology & Geography   | -3691.92              | 4549.15        | -0.81    |
| Industrial and Management Systems Engineering                               | 19970.17              | 5978.58        | 3.34***  |
| Mathematics   | -4404.79              | 3691.91        | -1.19    |
| Mechanical & Aerospace Engineering  | 19855.91              | 3864.75        | 5.14***  |
| Mining Engineering  | 32510.62              | 10495.50       | 3.10**   |
| Petroleum & Natural Gas Engineering   | 29658.03              | 7535.76        | 3.94***  |
| Physics   | 8177.42               | 6282.42        | 1.30     |
| Political Science   | -1933.90              | 4547.17        | -0.43    |
| Psychology  | 2590.86               | 4104.70        | 0.63     |
| Sociology & Anthropology  | -6872.82              | 3419.22        | -2.01*   |
| Statistics  | 11157.18              | 6633.82        | 1.68     |
| Race (White=1)  | 362.97                | 2409.63        | 0.15     |
| Gender (Female=1)   | -1690.88              | 1647.93        | -1.03    |
| Model Fit: Adjusted R <sup>2</sup> =.573<br>F-Statistic= 26.45              |                       |                |          |
| Notes: The baseline group is White, female assistant professors in Biology. |                       |                |          |
| *Significant at .05 level   |                       |                |          |
| **Significant at .01 level  |                       |                |          |
| ***Significant at the .001 level  |                       |                |          |

| Table 4. Actual Salary Regression Results for Faculty in Engineering:<br>With and Without Rank |                          |                          |
|--|--------------------------|--------------------------|
| (N=123)  |                          |                          |
|  | <b>With Rank</b>         | <b>Without Rank</b>      |
| Constant   | 88228.15<br>(8081.69)*** | 91996.72<br>(9612.40)*** |
| Years at Rank  | -479.50<br>(479.39)      | -356.11<br>(365.22)      |
| Years of Service   | 380.78<br>(518.86)       | 1272.85<br>(329.42)***   |
| Associate  | 8561.70<br>(4574.95)     |                          |
| Full   | 39454.86<br>(9521.34)*** |                          |
| Civic and Environmental Engineering  | -3473.79<br>(9558.40)    | 676.57<br>(10937.69)     |
| Computer Science & Electrical Engineering  | -1106.15<br>(8075.32)    | 628.06<br>(9458.32)      |
| Industrial and Management Systems Engineering  | -6879.72<br>(9173.05)    | -7008.73<br>(10264.50)   |
| Mechanical & Aerospace Engineering   | -6758.44<br>(7733.62)    | -5539.18<br>(8597.99)    |
| Mining Engineering   | 6390.71<br>(12112.98)    | 8203.90<br>(17755.66)    |
| Petroleum & Natural Gas Engineering  | 2359.19<br>(9511.41)     | 2426.75<br>(10804.36)    |
| Race (White = 1)   | 2534.83<br>(3965.54)     | 4089.80<br>(4383.58)     |
| Gender (Female = 1)  | -2058.15<br>(2685.26)    | -14198.18<br>(5277.82)** |
| Adjusted R <sup>2</sup>  | .444                     | .243                     |
| Notes: The baseline group is White, female assistant professors in Chemical Engineering.       |                          |                          |
| *Significant at .05 level  |                          |                          |
| **Significant at .01 level   |                          |                          |
| ***Significant at the .001 level   |                          |                          |

|  | Estimated Coefficient | Standard Error | t-value |
|--|-----------------------|----------------|---------|
| Constant   | 210.40                | 429.01         | 0.49    |
| Associate  | 1130.47               | 612.35         | 1.85    |
| Full   | 1148.63               | 303.95         | 3.78*** |
| Funding  | 0.00                  | 0.00           | 0.80    |
| Civic and Environmental Engineering  | 974.12                | 777.44         | 1.25    |
| Computer Science & Electrical Engineering  | -283.59               | 411.29         | -0.69   |
| Industrial and Management Systems Engineering  | -458.02               | 485.78         | -0.94   |
| Mechanical & Aerospace Engineering   | 658.07                | 644.15         | 1.02    |
| Mining Engineering   | -368.04               | 506.80         | -0.73   |
| Petroleum & Natural Gas Engineering  | -711.92               | 414.83         | -1.72   |
| Gender (Female=1)  | 189.48                | 301.38         | 0.63    |
| Model Fit: Adjusted R <sup>2</sup> =.080<br>F-Statistic= 2.51  |                       |                |         |
| Notes: The baseline group is female assistant professors in Chemical Engineering.<br>*Significant at .05 level<br>**Significant at .01 level<br>***Significant at the .001 level |                       |                |         |

|   | Estimated Coefficient | Standard Error | t-value |
|---|-----------------------|----------------|---------|
| Constant  | 57.47                 | 787.08         | 0.07    |
| Associate   | 846.57                | 399.24         | 2.12*   |
| Full  | 1427.96               | 529.98         | 2.69**  |
| Funding   | 0.00                  | 0.00           | 1.02    |
| Civic and Environmental Engineering   | 1251.33               | 1153.81        | 1.08    |
| Computer Science & Electrical Engineering   | -625.89               | 627.54         | -1.00   |
| Industrial and Management Systems Engineering   | -1560.19              | 910.38         | -1.71   |
| Mechanical & Aerospace Engineering  | 301.53                | 634.98         | 0.47    |
| Mining Engineering  | -152.84               | 769.32         | -0.20   |
| Petroleum & Natural Gas Engineering   | -971.43               | 667.03         | -1.46   |
| Gender (Female=1)   | 521.92                | 396.86         | 0.07    |
| Model Fit: Adjusted R <sup>2</sup> =.143<br>F-Statistic= 1.59   |                       |                |         |
| Notes: The baseline group is female assistant professors in Chemical Engineering<br>*Significant at .05 level<br>**Significant at .01 level<br>***Significant at the .001 level |                       |                |         |

| Table 7. Space Regression Results for Faculty in Arts & Sciences<br>(N=136)  |                       |                |          |
|--|-----------------------|----------------|----------|
|  | Estimated Coefficient | Standard Error | t-value  |
| Constant   | 1097.18               | 327.94         | 3.35***  |
| Associate  | 126.50                | 92.88          | 1.36     |
| Full   | 492.48                | 165.69         | 2.97**   |
| Funding  | 0.00                  | 0.00           | 0.60     |
| Chemistry  | -96.21                | 412.07         | -0.23    |
| Geology and Geography  | -754.17               | 365.37         | -2.06*   |
| Mathematics  | -1238.84              | 364.88         | -3.40*** |
| Physics  | -499.80               | 415.00         | -1.20    |
| Political Science <sup>^</sup>   | -1119.35              | 338.62         | -3.31*** |
| Psychology   | -579.19               | 362.17         | -1.60    |
| Sociology and Anthropology   | -1019.19              | 320.03         | -3.18**  |
| Statistics   | -1190.98              | 343.13         | -3.47*** |
| Gender (Female=1)  | -5.30                 | 120.06         | -0.04    |
| Model Fit: Adjusted R <sup>2</sup> =.257<br>F-Statistic= 8.39  |                       |                |          |
| Notes: The baseline group is female assistant professors in Biology<br><sup>^</sup> Data was only available for four members of the department.<br>*Significant at .05 level    **Significant at .01 level    ***Significant at the .001 level |                       |                |          |

| Table 8. Space Regression Results for Faculty in Arts & Sciences<br>(Only individuals with funding)<br>(N=62)  |                       |                |         |
|--|-----------------------|----------------|---------|
|  | Estimated Coefficient | Standard Error | t-value |
| Constant   | 1103.96               | 457.78         | 2.41*   |
| Associate  | 215.60                | 227.11         | 0.95    |
| Full   | 773.29                | 313.02         | 2.47*   |
| Funding  | -0.00                 | 0.00           | -0.03   |
| Chemistry  | -88.41                | 611.62         | -0.14   |
| Geology and Geography  | -986.63               | 508.39         | -1.94   |
| Mathematics  | -1271.39              | 473.72         | -2.68** |
| Physics  | -89.28                | 614.57         | -0.15   |
| Political Science  | -1169.52              | 395.81         | -2.95** |
| Psychology   | -937.83               | 530.27         | -1.77   |
| Statistics   | -1245.57              | 468.75         | -2.66*  |
| Gender (Female=1)  | -83.87                | 197.39         | -0.42   |
| Model Fit: Adjusted R <sup>2</sup> =.189<br>F-Statistic= 3.96  |                       |                |         |
| Notes: The baseline group is female assistant professors in Biology<br>*Significant at .05 level    **Significant at .01 level    ***Significant at the .001 level |                       |                |         |

Table 9: Correlations for Salary Variables

|   | 1     | 2       | 3       | 4       | 5     | 6        | 7        | 8       | 9        | 10      | 11      | 12      |
|---|-------|---------|---------|---------|-------|----------|----------|---------|----------|---------|---------|---------|
| 1. General Job Satisfaction                         | 1.000 | .493*** | .410*** | .507*** | -.108 | -.033    | .138     | .147    | .089     | .536*** | .403*** | .388*** |
| 2. Satisfaction w/ department process               |       | 1.000   | .386*** | .613*** | -.031 | -.140    | .103     | -.104   | .003     | .466*** | .447*** | .191*   |
| 3. Perceived equality                               |       |         | 1.000   | .462*** | .203* | -.019    | -.126    | .286*** | -.006    | .686*** | .411*** | .350*** |
| 4. Perceived justice                                |       |         |         | 1.000   | -.128 | -.115    | .101     | -.026   | .081     | .376*** | .287**  | .350*** |
| 5. Faculty appointment Engineering                  |       |         |         |         | 1.000 | -.273*** | -.371*** | -.122   | -.295*** | .220**  | .107    | .025    |
| 6. Discipline mathematical and statistical sciences |       |         |         |         |       | 1.000    | -.203**  | -.022   | -.024    | -.076   | -.053   | -.153   |
| 7. Discipline social and behavioral sciences        |       |         |         |         |       |          | 1.000    | .105    | .260**   | -.170*  | -.205** | .017    |
| 8. Tenured  |       |         |         |         |       |          |          | 1.000   | .323***  | .234**  | .024    | .220**  |
| 9. Female   |       |         |         |         |       |          |          |         | 1.000    | -.008   | .049    | .199*   |
| 10. Satisf. w/ current salary                       |       |         |         |         |       |          |          |         |          | 1.000   | .578*** | .478*** |
| 11. Satisf. w/opportunity to supplement salary      |       |         |         |         |       |          |          |         |          |         | 1.000   | .299*** |
| 12. Satisf. w/ benefits                             |       |         |         |         |       |          |          |         |          |         |         | 1.000   |

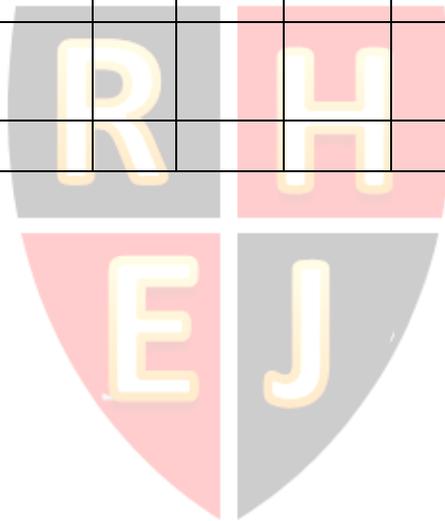
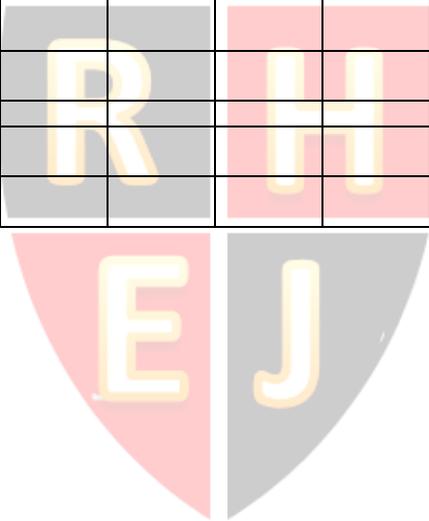


Table 10: Correlations for Space Variables

|  | 1     | 2       | 3        | 4        | 5        | 6        | 7        | 8        | 9     | 10       | 11       | 12       |
|--|-------|---------|----------|----------|----------|----------|----------|----------|-------|----------|----------|----------|
| 1. General Job Satisfaction                            | 1.000 | -.237** | .375***  | .362***  | .386***  | -.108    | -.033    | .138     | .147  | .089     | .304***  | .413***  |
| 2. Understanding of space allocation decisions         |       | 1.000   | -.628*** | -.672*** | -.335*** | .346***  | .155     | -.218**  | .026  | -.114    | -.368*** | -.384*** |
| 3. Satisfaction w/ space allocation decisions          |       |         | 1.000    | .549***  | .340***  | -.353*** | .015     | .284***  | .085  | .125     | .364***  | .535***  |
| 4. Participation in space allocation decisions         |       |         |          | 1.000    | .423***  | -.341*** | -.128    | .200     | -.041 | .047     | .403***  | .391***  |
| 5. Consistency of space allocation decisions           |       |         |          |          | 1.000    | -.263**  | -.026    | .210*    | .032  | .067     | .347***  | .423***  |
| 6. Faculty appointment in Engineering                  |       |         |          |          |          | 1.000    | -.273*** | -.371*** | -.122 | -.295*** | -.284*** | -.472*** |
| 7. Discipline in mathematical and statistical sciences |       |         |          |          |          |          | 1.000    | -.203**  | -.022 | -.024    | -.239**  | .042     |
| 8. Discipline in social and behavioral sciences        |       |         |          |          |          |          |          | 1.000    | .105  | .260**   | .221**   | .432***  |
| 9. Tenured   |       |         |          |          |          |          |          |          | 1.000 | .323***  | .044     | .203     |
| 10. Female   |       |         |          |          |          |          |          |          |       | 1.000    | .246**   | .373***  |
| 11. Office space satisfaction                          |       |         |          |          |          |          |          |          |       |          | 1.000    | .654***  |
| 12. Research space satisfaction                        |       |         |          |          |          |          |          |          |       |          |          | 1.000    |



| Table 11. Regression Results for Satisfaction with Current Salary<br>(N=110)                |                       |                |          |
|---|-----------------------|----------------|----------|
|   | Estimated Coefficient | Standard Error | t-value  |
| Constant  | -0.96                 | 0.29           | -3.30*** |
| General Satisfaction with job   | 0.31                  | 0.09           | 3.37***  |
| Satisfaction with department process  | 0.21                  | 0.09           | 2.37*    |
| Equity Scale  | 0.23                  | 0.04           | 5.42***  |
| Justice Scale   | -0.03                 | 0.03           | -0.76    |
| College (1=Engineering)   | 0.42                  | 0.20           | 2.09*    |
| Mathematical and Statistical Sciences   | 0.07                  | 0.29           | 0.23     |
| Social and Behavioral Sciences  | -0.39                 | 0.19           | -2.12*   |
| Tenure status   | 0.40                  | 0.16           | 2.58*    |
| Sex (1= Female)   | 0.05                  | 0.15           | 0.30     |
| Model Fit: Adjusted R <sup>2</sup> = .576<br>F-Statistic= 43.50                             |                       |                |          |
| Notes: The baseline group is Natural and Physical Sciences.                                 |                       |                |          |
| *Significant at .05 level<br>**Significant at .01 level<br>***Significant at the .001 level |                       |                |          |

| Table 12. Regression Results for Opportunity to Supplement Salary<br>(N=110)                |                       |                |         |
|---|-----------------------|----------------|---------|
|   | Estimated Coefficient | Standard Error | t-value |
| Constant  | 1.20                  | 0.53           | 2.24*   |
| General Satisfaction with job   | 0.19                  | 0.12           | 1.63    |
| Satisfaction with department process  | 0.33                  | 0.12           | 2.74**  |
| Equity Scale  | 0.10                  | 0.06           | 1.76    |
| Justice Scale   | 0.00                  | 0.05           | 0.06    |
| College (1=Engineering)   | 0.08                  | 0.26           | 0.32    |
| Mathematical and Statistical Sciences   | 0.03                  | 0.35           | 0.18    |
| Social and Behavioral Sciences  | -0.77                 | 0.29           | -2.69** |
| Tenure status   | -0.07                 | 0.21           | -0.33   |
| Sex (1= Female)   | 0.47                  | 0.23           | 2.07*   |
| Model Fit: Adjusted R <sup>2</sup> = .305<br>F-Statistic= 7.66                              |                       |                |         |
| Notes: The baseline group is Natural and Physical Sciences.                                 |                       |                |         |
| *Significant at .05 level<br>**Significant at .01 level<br>***Significant at the .001 level |                       |                |         |

| Table 13. Regression Results for Satisfaction with Benefits<br>(N=110)                      |                       |                |         |
|---|-----------------------|----------------|---------|
|   | Estimated Coefficient | Standard Error | t-value |
| Constant  | 0.74                  | 0.53           | 1.41    |
| General Satisfaction with job   | 0.26                  | 0.15           | 1.81    |
| Satisfaction with department process  | 0.05                  | 0.13           | 0.37    |
| Equity Scale  | 0.12                  | 0.06           | 1.87    |
| Justice Scale   | -0.03                 | 0.06           | -0.51   |
| College (1=Engineering)   | 0.05                  | 0.30           | 0.17    |
| Mathematical and Statistical Sciences   | -0.65                 | 0.37           | -1.77   |
| Social and Behavioral Sciences  | -0.26                 | 0.29           | -0.92   |
| Tenure status   | 0.28                  | 0.25           | 1.13    |
| Sex (1= Female)   | 0.76                  | 0.26           | 2.92**  |
| Model Fit: Adjusted R <sup>2</sup> = .211<br>F-Statistic= 7.03                              |                       |                |         |
| Notes: The baseline group is Natural and Physical Sciences.                                 |                       |                |         |
| *Significant at .05 level<br>**Significant at .01 level<br>***Significant at the .001 level |                       |                |         |

| Table 14. Regression Results for Office Space Satisfaction<br>(N=122)                       |                       |                |          |
|---|-----------------------|----------------|----------|
|   | Estimated Coefficient | Standard Error | t-value  |
| Constant  | 14.61                 | 1.98           | 7.36***  |
| General Satisfaction with job   | 0.41                  | 0.38           | 1.10     |
| Understanding of space allocation decisions   | 0.32                  | 0.56           | 0.56     |
| Satisfaction with space allocation decisions  | 0.58                  | 0.55           | 1.06     |
| Participation in space allocation decisions   | 0.27                  | 0.44           | 0.62     |
| Consistency of space allocation decisions   | 0.57                  | 0.39           | 1.49     |
| College (1=Engineering)   | -1.76                 | 1.07           | -1.65    |
| Mathematical and Statistical Sciences   | -3.35                 | 0.92           | -3.66*** |
| Social and Behavioral Sciences  | -0.70                 | 0.89           | -0.79    |
| Tenure status   | -0.64                 | 0.72           | -0.89    |
| Sex (1= Female)   | 1.49                  | 0.81           | 1.83     |
| Model Fit: Adjusted R <sup>2</sup> = .276<br>F-Statistic= 9.41                              |                       |                |          |
| Notes: The baseline group is Natural and Physical Sciences.                                 |                       |                |          |
| *Significant at .05 level<br>**Significant at .01 level<br>***Significant at the .001 level |                       |                |          |

Table 15. Regression Results for Research Space Satisfaction  
(N=80)

|  | Estimated Coefficient | Standard Error | t-value |
|--|-----------------------|----------------|---------|
| Constant   | 9.68                  | 2.68           | 3.62*** |
| General Satisfaction with Job                                  | 0.54                  | 0.52           | 1.03    |
| Understanding of space allocation decisions                    | -0.19                 | 0.67           | -0.29   |
| Satisfaction with space allocation decisions                   | 1.61                  | 0.64           | 2.51*   |
| Participation in space allocation decisions                    | 0.04                  | 0.46           | 0.09    |
| Consistency of space allocation decisions                      | 0.75                  | 0.35           | 2.14*   |
| College (1=Engineering)  | -1.70                 | 1.14           | -1.49   |
| Mathematical and Statistical Sciences                          | 1.38                  | 1.31           | 1.05    |
| Social and Behavioral Sciences                                 | 0.31                  | 1.11           | 0.28    |
| Tenure status  | 0.08                  | 0.84           | 0.09    |
| Sex (1= Female)  | 1.32                  | 1.00           | 1.31    |
| Model Fit: Adjusted R <sup>2</sup> = .446<br>F-Statistic= 8.81 |                       |                |         |
| Notes: The baseline group is Natural and Physical Sciences.    |                       |                |         |
| *Significant at .05 level                                      |                       |                |         |
| **Significant at .01 level                                     |                       |                |         |
| ***Significant at the .001 level                               |                       |                |         |

| Table 16. Regression Results for Satisfaction with Current Salary: Comparisons by Sex |   |         |   |          |
|---|---|---------|---|----------|
|   | Females Only<br>(N=34)  |         | Males Only<br>(N=88)  |          |
|   | Estimated<br>Coefficient<br>(Standard Error)                        | t-value | Estimated<br>Coefficient<br>(Standard Error)                        | t-value  |
| Constant  | -1.279<br>(0.577)   | -2.22*  | -0.677<br>(0.331)   | -2.05*   |
| General<br>Satisfaction with<br>Job   | 0.167<br>(0.141)  | 1.18    | 0.319<br>(0.104)  | 3.06**   |
| Satisfaction with<br>department<br>process  | 0.423<br>(0.157)  | 2.71*   | 0.209<br>(0.096)  | 2.18*    |
| Equity Scale  | 0.188<br>(0.063)  | 2.97**  | 0.225<br>(0.050)  | 4.47***  |
| Justice Scale   | 0.017<br>(0.062)  | 0.28    | -0.045<br>(0.040)   | -1.12    |
| College<br>(1=Engineering)  | 0.755<br>(0.365)  | 2.07*   | 0.228<br>(0.238)  | 0.96     |
| Mathematical<br>and Statistical<br>Sciences   | 0.219<br>(0.293)  | 0.75    | -0.061<br>(0.324)   | -0.19    |
| Social and<br>Behavioral<br>Sciences  | 0.209<br>(0.297)  | 0.70    | -0.822<br>(0.246)   | -3.35*** |
| Tenure Status   | 0.265<br>(0.245)  | 1.24*   | 0.456<br>(0.175)  | 2.60*    |
|   | Model Fit:<br>Adjusted<br>R <sup>2</sup> =.667<br>F Statistic=20.86 |         | Model Fit:<br>Adjusted<br>R <sup>2</sup> =.601<br>F Statistic=46.80 |          |
| Notes: The baseline group is Natural and Physical Sciences.                           |   |         |   |          |
| *Significant at .05 level   |   |         |   |          |
| **Significant at .01 level  |   |         |   |          |
| ***Significant at the .001 level  |   |         |   |          |

|   | Females Only<br>(N=40)                                   |         | Males Only<br>(N=94)                                     |         |
|---|--|---------|--|---------|
|   | Estimated<br>Coefficient<br>(Standard Error)             | t-value | Estimated<br>Coefficient<br>(Standard Error)             | t-value |
| Constant  | 11.478<br>(3.625)  | 3.17**  | 14.745<br>(2.69)   | 5.49*** |
| General<br>Satisfaction with<br>Job                         | -0.230<br>(0.804)  | -0.29   | 0.607<br>(0.399)   | 1.52    |
| Understanding<br>of space<br>allocation<br>decisions        | -0.211<br>(0.764)  | -0.28   | 0.971<br>(0.711)   | 0.14    |
| Satisfaction with<br>space allocation<br>decisions          | 2.188<br>(0.875)   | 2.50*   | 0.355<br>(0.615)   | 0.58    |
| Participation in<br>space allocation<br>decisions           | -0.306<br>(0.534)  | -0.57   | 0.613<br>(0.551)   | 1.11    |
| Consistency of<br>space allocation<br>decisions             | 0.870<br>(0.433)   | 2.01    | 0.336<br>(0.537)   | 0.63    |
| College<br>(1=Engineering)                                  | -2.292<br>(1.895)  | -1.21   | -1.339<br>(1.443)  | -0.93   |
| Mathematical<br>and Statistical<br>Sciences                 | -2.935<br>(1.800)  | -1.63   | -3.113<br>(1.343)  | -2.32*  |
| Social and<br>Behavioral<br>Sciences                        | -1.312<br>(1.586)  | -0.83   | 0.099<br>(1.323)   | 0.07    |
| Tenure Status   | 1.644<br>(1.184)   | 1.39    | -0.869<br>(0.886)  | -0.98   |
|   | Model Fit:<br>Adjusted<br>$R^2=.228$<br>F Statistic=1.96 |         | Model Fit:<br>Adjusted<br>$R^2=.213$<br>F Statistic=6.08 |         |
| Notes: The baseline group is Natural and Physical Sciences. |  |         |  |         |
| *Significant at .05 level                                   |  |         |  |         |
| **Significant at .01 level                                  |  |         |  |         |
| ***Significant at the .001 level                            |  |         |  |         |

Table 18. Regression Results for Research Space Satisfaction: Comparisons by Sex

|  | Females Only<br>(N=27)                                   |         | Males Only<br>(N=55)                                     |         |
|--|--|---------|--|---------|
|  | Estimated<br>Coefficient<br>(Standard Error)             | t-value | Estimated<br>Coefficient<br>(Standard Error)             | t-value |
| Constant   | 8.108<br>(4.808)   | 1.69    | 7.800<br>(3.437)   | 2.27*   |
| General<br>Satisfaction with<br>Job                  | -0.000<br>(1.070)  | -0.00   | 0.615<br>(0.623)   | 0.99    |
| Understanding<br>of space<br>allocation<br>decisions | 1.275<br>(1.417)   | 0.90    | 0.054<br>(0.930)   | 0.06    |
| Satisfaction with<br>space allocation<br>decisions   | 3.732<br>(1.094)   | 3.41**  | 0.871<br>(0.724)   | 1.20    |
| Participation in<br>space allocation<br>decisions    | -0.732<br>(0.734)  | -1.00   | 0.691<br>(0.566)   | 1.22    |
| Consistency of<br>space allocation<br>decisions      | 0.838<br>(0.417)   | 2.01    | 0.287<br>(0.565)   | 0.51    |
| College<br>(1=Engineering)                           | -3.878<br>(2.912)  | -1.33   | -0.042<br>(1.459)  | -0.03   |
| Mathematical<br>and Statistical<br>Sciences          | -  | -       | 2.466<br>(1.490)   | 1.65    |
| Social and<br>Behavioral<br>Sciences                 | -0.549<br>(2.097)  | -0.26   | 3.058<br>(1.706)   | 1.79    |
| Tenure Status  | 2.153<br>(1.759)   | 1.22    | 1.010<br>(1.141)   | 0.89    |
|  | Model Fit:<br>Adjusted<br>$R^2=.372$<br>F Statistic=5.53 |         | Model Fit:<br>Adjusted<br>$R^2=.278$<br>F Statistic=6.84 |         |

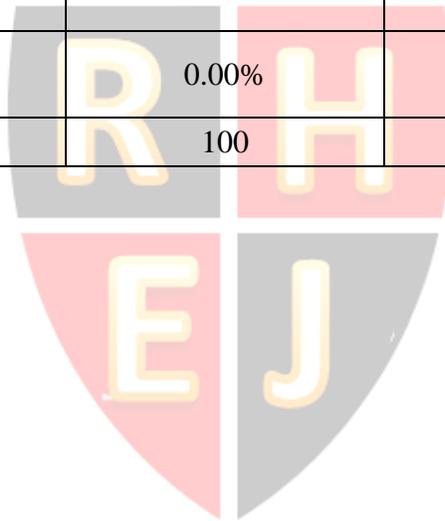
Notes: The baseline group is Natural and Physical Sciences.

\*Significant at .05 level

\*\*Significant at .01 level

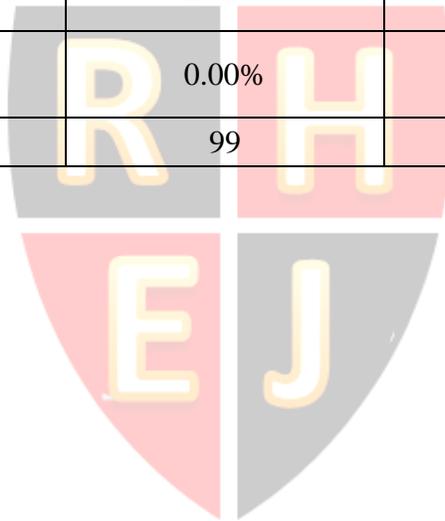
\*\*\*Significant at the .001 level

| Table 19. Survey Response to Salary Comparison with Peers at the Institution<br>(N = 141)   |        |        |
|---|--------|--------|
| When you compare your base salary to the base salaries that you believe that faculty members whose seniority and professional performance are generally equivalent to yours are receiving, would you characterize your personal base salary as: |        |        |
| Answer  | Male   | Female |
| Much lower than theirs  | 23.00% | 12.20% |
| Somewhat lower than theirs  | 22.00% | 39.02% |
| About the same as theirs  | 45.00% | 48.78% |
| Somewhat higher than theirs   | 10.00% | 0.00%  |
| Much higher than theirs   | 0.00%  | 0.00%  |
| Total   | 100    | 41     |



| Table 20. Faculty Perceptions of why their salary is lower than their peers at the institution (N= 50) |           |           |           |
|--|-----------|-----------|-----------|
| Why do you think your salary is lower than that of comparable colleagues at <institution>?             |           |           |           |
| University-Level Problems  | Total     | Male      | Female    |
| Salary Compression   | 7         | 4         | 3         |
| Inadequate Raises  | 4         | 3         | 1         |
| Flawed Evaluation Process  | 3         | 3         |           |
|  | 14        | 10 (30%)  | 4 (40%)   |
| <b>Salary Differences between Units of the University</b>  |           |           |           |
| Differences between discipline categories (generally attributed to market forces)                      | 6         | 4         | 2         |
| Differences between departments  | 2         | 2         |           |
| Differences between Colleges   | 1         | 1         |           |
|  | 9         | 7(21%)    | 2 (20%)   |
| <b>Department-Level Problems</b>   |           |           |           |
| Cronyism by past Chair   | 2         | 2         |           |
|  | 2         | 2 (6%)    |           |
| <b>Personal History</b>  |           |           |           |
| Low starting salary  | 5         | 4         | 1         |
|  | 5         | 4 (12%)   | 1 (10%)   |
| <b>Lack of Recognition for Personal Contributions</b>  |           |           |           |
| Service not rewarded   | 3         | 1         | 2         |
| Research not rewarded  | 3         | 3         |           |
| Teaching not rewarded  | 2         | 2         |           |
| Administrative contributions not rewarded  | 1         | 1         |           |
| Hard work not rewarded   | 1         | 1         |           |
|  | 10        | 8 (24%)   | 2 (20%)   |
| <b>Personal Shortcomings</b>   |           |           |           |
| Poor negotiation   | 2         | 1         | 1         |
| Inferior personal experience/credentials/accomplishments   | 1         | 1         |           |
|  | 3         | 2 (6%)    | 1 (10%)   |
| <b>TOTALS</b>  | <b>43</b> | <b>33</b> | <b>10</b> |
| <b>Non Classified Responses</b>  |           |           |           |
| Focus on method for determining salary   | 8         | 6         | 2         |
| Comparison with other universities   | 3         | 3         |           |
| Unclear  | 3         | 1         | 2         |

| Table 21. Survey Response to Salary Comparison with Peers at Other Institutions<br>(N = 138)  |        |        |
|---|--------|--------|
| When you compare your base salary to the base salaries that you believe that faculty members at other universities whose seniority and professional performance are generally equivalent to yours are receiving, would you characterize your personal base salary as: |        |        |
| Answer  | Male   | Female |
| Much lower than theirs  | 44.44% | 46.15% |
| Somewhat lower than theirs  | 36.36% | 28.21% |
| About the same as theirs  | 17.17% | 25.64% |
| Somewhat higher than theirs   | 2.02%  | 0.00%  |
| Much higher than theirs   | 0.00%  | 0.00%  |
| Total   | 99     | 39     |



| Table 22. Faculty Perceptions of why their salary is lower than their peers at other institutions<br>(N = 79) |       |          |          |
|---|-------|----------|----------|
| Why do you think your salary is lower than that of comparable colleagues at similar universities?             |       |          |          |
| State-Level Factors   | Total | Male     | Female   |
| Low state resources / low state support for university  | 5     | 3        | 2        |
| Poor state  | 5     | 2        | 3        |
| All salaries low in the state   | 3     | 2        | 1        |
| Not a state priority  | 1     | 1        |          |
| Presence of labor unions  | 1     | 1        |          |
| Low cost of living  | 6     | 5        | 1        |
|   | 21    | 14 (29%) | 7 (41%)  |
| University Financial Factors  |       |          |          |
| Low starting salary/low salary scale/compression  | 11    | 8        | 3        |
| Inflated Administrators/Coaches salaries  | 2     | 2        |          |
| Low or no raises  | 3     | 3        |          |
| College has not kept pace   | 1     | 1        |          |
| Expensive benefits  | 3     | 3        |          |
| Sex and discipline differences  | 1     |          | 1        |
| Low endowments / Less money   | 5     | 2        | 3        |
| Low profile department at university  | 2     |          | 2        |
| Low tuition   | 3     | 2        | 1        |
|   | 31    | 21 (44%) | 10 (59%) |
| University Internal Practices   |       |          |          |
| Flawed evaluation process   | 1     | 1        |          |
| Research not rewarded   | 2     | 2        |          |
| Not a university priority   | 4     | 4        |          |
| Summer work discouraged   | 1     | 1        |          |
|   | 8     | 8 (17%)  | 0        |
| External Factors  |       |          |          |
| Differences among institutions  | 1     | 1        |          |
| Low profile university  | 4     | 4        |          |
|   | 5     | 5 (10%)  | 0        |
| <b>TOTAL COMMENTS</b>   |       | 48       | 17       |
| Non Classified Responses  |       |          |          |
| Comparative study with other universities   |       | 19       | 7        |