Proposed and Emerging Social Science Research Activities

Two studies were included in the proposal for funding. The first aims to examine discourse in electronic communications, and the second aims to examine the social networks of STEM faculty. Both studies are currently in progress, and since the award, the research team has developed three further studies. The original studies are outlined below, and newly initiated research follows in the next section. For each, we detail where relevant the 1) primary aims and hypotheses, 2) progress of the project, 3) outcomes where applicable, and 4) relevance to primary initiatives of LEAF.

Discourse Analysis

Discourse analysis allows for the examination of how language is used to communicate knowledge, identity, and social relationships within an institutional framework (Luke, 1996). Research on communication within organizations has shown that it is a strong determinant of the organizational environment (e.g., Alvesson & Karreman, 2000) that can result in larger schemas about self and others (Fairclough and Wodak, 1997), and as such, is instrumental in directing the behavior of members of the organization. Communication can therefore be studied to reveal the underlying power structures and ideology of an institution and the pathways through which it influences institutional outcomes (Hardy, 2004).

1) The purpose of this study is to gain understanding of the underlying beliefs of UC and the information transmitted to its members by examining commonplace communications within the institution. More specifically, the research team aims to examine whether social inequality expressed through written communication and policy changes as a function of institutional changes related to LEAF. To do so, the research team proposed to analyze baseline communications in the two-year period prior to funding (Time 1), and again upon completion of the award period (Time 2).

   **Hypothesis 1:** Social inequality between men and women STEM faculty, as expressed through written language, will decrease from Time 1 to Time 2.

   **Hypothesis 2:** Supportive communications regarding women STEM faculty will increase from Time 1 to Time 2.

2) During the first year, the research team focused efforts on gathering necessary raw data for analysis, converting data for coding, and training graduate and undergraduate research assistants in the relevant methodologies and software. In order to examine baseline university discourse in the STEM disciplines, e-mails from five university listservs were gathered from the years 2000-2012, including those for the College of Engineering and Applied Science (CEAS), College of Medicine (COM), Research Faculty (RF), General Faculty (GF), and Deans, Department Heads, and Directors (DDD). Listserv messages were output in Unix executable files, rendering over 60,000 pages of code embedded e-mails. E-mail extraction revealed 3,364 unique messages, and initial sorting identified 1,162 e-mails relevant to the STEM sciences (254 from CEAS, 359 from COM, 148 from RF, 155 from GF, and 246 from DDD).

   In the second year, the research team worked with graduate and undergraduate research assistants to develop the necessary coding schemes and begin coding the email communications. STEM e-mails were examined using QSR International’s NVivo 10 software (2010), with coding driven by research questions surrounding the status of STEM women faculty. A two-step procedure was used to analyze data inductively and reach consensus on coding schemes (Kreiner, Hollensbe, & Sheep, 2006).
3) Changes: At the end of year two, the research team concluded that changes in the direction of this project were required. First, upon examination of findings that emerged from coding of a substantial subset of the emails, it became evident that there was little depth to the communications, and that they do not provide an accurate lens as to how and when gender is conveyed, promoted, or the current status of issues related to climate. Specifically, analyses revealed that the content of the communications was largely fact based with little insight into themes related to policy, STEM, gender, diversity, work-life integration, advancement and promotion, professional development, etc.

We presented the findings to our External Advisory Committee this Fall, and they agreed that the current direction of the research was not likely to produce significant or impactful results that would contribute to the aims or initiatives of LEAF and UC. They emphasized that our efforts would be better centered on the other current and planned studies (explained below) because these studies would be more likely to produce important contributions and forward progress in the aims of LEAF and broadening participation in STEM. As such, we are in the process of completing baseline data coding and do not plan to follow-up with further analysis of email communications at Time 2. However, given that we proposed that other forms of “secondary” discourse might provide insight into the primary themes that we are interested in, the team is currently evaluating the efficacy analyzing websites, departmental bylaws, workload policies, RPT policies and letters, and hiring proposals.

4) If we can gain access to the secondary forms of discourse and communication for both Time 1 and Time 2 mentioned above, we believe we can still investigate the ways in which LEAF initiatives have impacted discourse regarding women in STEM across the university. For instance, we can compare quantifiable changes in recruitment, retention and advancement, with related changes to the content of such related documents as hiring ads or proposals, offer letters, and RPT documents (Goal 1). Similarly, we might examine whether there is a relationship between changes in perception of climate and discourse documents related to website content, RPT documents, and departmental bylaws (Goal 2).

Social Network Analysis
Social relationships and intra-organizational networking have repeatedly been shown to predict career success (e.g., Sparrowe, Liden, Wayne, & Kraimer, 2001). Social networks can provide social support as well as access to mentoring, advocacy, and other activities essential to career development (Seibert, Kraimer, & Liden, 2001). However, building social networks may become difficult when STEM women enter into an area where they are significantly outnumbered by their male colleagues and are judged, implicitly or explicitly, to be less competent outsiders. Social networks may also be more difficult for women to develop and sustain because they are more likely than men to experience conflicting work-home demands. Accordingly, institutional efforts to create a more inclusive climate that is supportive of women STEM faculty can significantly impact their ability to develop the social networks associated with greater career satisfaction and success.

1) The purpose of this study is to analyze the success of LEAF by assessing the social climate as expressed by social networks - the real connections between men and women STEM faculty within and external to UC – and the outcomes associated with those networks. More specifically, the research team aims to gather network data from women STEM faculty over the course of the grant. These data include STEM women faculty’s professional and personal networks, defined as those individuals faculty members feel at least 90% certain would provide a professional reference for a specific work-related activity (e.g., research, grant funding, community leadership, service) and those individuals faculty members rely on for professional or personal support (e.g., proposal editing,
conflict with supervisor, advice on work-life balance). Additional data would be gathered to assess faculty members’ satisfaction with and the utility of their network. The research team proposed to gather these data from women STEM faculty (and a nominated male peer) on an annual basis to examine network changes and the impact of those changes on outcomes of interest, including publications, funding, and satisfaction. We also proposed to interview approximately 10 department heads, directors, and deans to gauge their perceptions about women’s satisfaction with work, amount of supportive communication, and network equality between the genders.

**Hypothesis 1:** In year one, men will have more valuable social networks; however, over the course of the grant women’s networks will more closely resemble their male peers.

**Hypothesis 2:** As STEM women faculty’s networks evolve, they will benefit from more supportive communications and exposure to senior level (male and female) leadership, which will correspond with higher levels of satisfaction with work as reported in annual surveys.

**Hypothesis 3:** Minority women will initially have greater discrepancies in network depth and value. Over time, these networks will become more similar to those of other women and men.

**Hypothesis 4:** Initial interviews with administrators will show that they will overestimate equality in networks between the genders, the utility of women’s networks, and amount of supportive communications. However, women’s networks will become increasingly in line with administrative expectations.

2) The study design described above called for the research team to identify and recruit study participants from the LEAF learning communities. Specifically, in Year 1 we proposed to create at least three learning communities consisting of junior, mid-level, and senior women faculty from across campus. Due to some of the challenges we faced establishing our infrastructure in the first year, those learning communities did not begin until Year 2. In the interim, several members of the LEAF research team, including Rachel Kallen and Stacie Holloway, obtained funding from UC’s Faculty Development Council to attend a 5-day social network analysis (SNA) workshop at the University of Kentucky’s LINKS Center ([https://sites.google.com/site/linkscenterworkshop2013/](https://sites.google.com/site/linkscenterworkshop2013/)) in June 2013. The purpose of this workshop was to expose researchers to a variety of foundational and advanced techniques relating to SNA. A special feature of the workshop was an opportunity to schedule a one-on-one consultation with a faculty expert from LINKS. Drs. Kallen and Holloway and two graduate students then met with Dr. Joe Labianca to review our proposed methodology and the objectives of the SNA research. The result of this meeting was a significant shift in our thinking with the SNA study based not only on the capabilities (and limitations) of the proposed method, but also a more nuanced understanding of our women faculty’s experiences that was emerging from Year 1 of our work. We describe these changes next.

3) **Changes:** Moving into Year 2, the research team decided to shift our focus from collecting ego-network data as we had initially proposed to gathering intra-departmental, closed network data (similar to Christina Falci’s work at University of Nebraska-Lincoln). Ego network data captures a focal participant’s (i.e., faculty member’s) reports of the individuals in their network; however, this method does not require that we look at reciprocal ties (i.e., whether those contacts also consider the faculty member a tie) nor does it require that we map the networks of those other ties. Accordingly, we lose a great deal of information that could help us understand the real utility of the faculty members’ networks. By examining intradepartmental networks we overcome both of these limitations. Moreover, focusing on the department-level networks allows us to take into account cultural and structural differences that exist across disciplines and colleges. Given the advantages of this approach, in Year 2 we developed the survey instrument to be used to gather the SNA data from our STEM departments. Data collection began in Spring 2013. Because SNA requires that we obtain responses from 70% or more of eligible faculty members within a department, we have been approaching department heads individually to schedule time during monthly faculty meetings. We
have had greater success with this approach in some departments than others. As shown in the table below, we have completed data collection for 5 departments (1 CEAS; 4 A&S) and are in the process of completing the remaining 11 departments.

| College of Arts & Sciences |  
|---------------------------|---|
| Biological Sciences       | 81.8% |
| Communication             | 81.0% |
| Geology                   | 77.7% |
| Chemistry                 | 71.4% |
| Anthropology              | 38.5% |
| Physics                   | 40.0% |
| Psychology                | 45.0% |
| Sociology (scheduled for 12/14) | ---- |
| Political Science (scheduled for 12/14) | ---- |

| College of Business |  
|---------------------|---|
| Economics           | 50.0% |
| OBAIS (to be scheduled 1/15) | ---- |

| College of Engineering and Applied Sciences |  
|---------------------------------------------|---|
| Engineering Education                       | 100.0% |
| Biomedical, Chemical, and Environmental Engineering | 0.0% |
| Civil/Architectural and Construction Management | 0.0% |
| Mechanical Engineering (to be rescheduled 1/15) | ---- |
| Aerospace Engineering (to be rescheduled 1/15) | ---- |

| College of Medicine |  
|---------------------|---|
| Molecular Genetics, Biochemistry, and Microbiology | 56.5% |
| Molecular and Cellular Physiology               | 0.0% |
| Pharmacology and Cell Biophysics                | 27.3% |

We have conducted some preliminary analyses of the completed departmental data we have in hand and presented those analyses at the 2013 PI meeting. For example, we have looked at four departments to compare the research and support networks for men and women faculty. Consistent with expectations, we found that in some departments women faculty reside on the periphery of the department’s research network (defined by connections pertaining to “research,” “publication,” and “grant funding”) but tend to be more central to the department’s socio-affective network (“friendship,” “trust,” and “sounding board”).

4) Moving forward, we anticipate completion of the data collection in January 2015 at which time we will begin more in-depth analysis of the intradepartmental data to examine network characteristics and their relationship to a variety of outcomes including objective measures of faculty performance (e.g., publications, funding) but also more subjective measures of their experiences (e.g., satisfaction with network, intentions to leave, and climate as reported in the LEAF climate survey). We also plan to utilize these findings to design top-down and bottom-up interventions consistent with LEAF’s broader objectives. For the top-down programming, our goal is to classify departments according to their type of network structure and to discuss with their leadership the positive or negative implications of those structures. Where opportunities exist to build more effective networks that support all faculty, we will work with those departments to develop appropriate action plans. For our bottom-up efforts, we will invite our women faculty to a networking workshop in which (if they choose) we will provide them a copy of their ego-network data and discuss, when necessary, strategies for building a more robust and effective network.
Commensurate with the departmental data we are collecting, we are continuing to work on a process that will allow us to gather, in an efficient and systematic way, data relating to faculty members’ collaborative networks as well. Specifically, we have been working with Institutional Research and the Office of Research since Year 1 to gather data relating to faculty’s co-authorship networks as well as their grant networks (i.e., with whom they work on grant proposals and active grants). Attempts to gather these data via existing databases (e.g., SCOPUS externally and UC’s COEUS system internally) have proven to be unreliable. As discussed elsewhere in this report (Internal Evaluation Year 3, Section 14.4, p. 2), new annual reporting requirements should allow these data to be available beginning as soon as Spring 2015. If so, our plan is to supplement the departmental data with the collaboration data to paint a more comprehensive picture of networks within and external to UC.

New Research

Interventions to Reduce Implicit Bias

Cultural competence and an understanding of how implicit biases influence outcomes and decision-making processes are critical for reducing barriers to broader participation of women and individuals from underrepresented backgrounds in STEM fields. Specifically, achieving diversity in these domains comes from the ability to increase cultural competence and reduce pervasive and robust implicit biases that can occur between individuals of different backgrounds (e.g., Rachlinski, et al., 2009). While individuals may often have explicitly positive attitudes and adequate knowledge of members of other groups, implicit biases can often manifest in linguistic, nonverbal, or physical behaviors that reduce the efficacy of social interactions because they are often beyond the awareness or intentional control of the individual (e.g., Rudman, 2004). As such, interventions to reduce implicit bias can be difficult to achieve through traditional informational or educational interventions.

1) While there exists a large scientific literature on the existence and origins of implicit bias and its influence on outcomes for members of underrepresented groups in STEM, there still remains a large gap in our understanding of the ways in which we can effectively mitigate the consequences of implicit bias in the academy. This line of research will utilize our broad understanding of how implicit bias is conveyed in interpersonal interactions and institutional policy (e.g., microaggressions, gendered or undermining language, etc.) to develop culturally competent and innovative ways in which we may train members of administration, departmental colleagues, and committees (RPT, Search) in actions that lead to equitable policy, improved climate, and that reduce barriers to recruitment, retention, and advancement in STEM.

Our aim is to utilize the expertise both within the LEAF research team, as well as with colleagues in both Arts & Sciences, and Cincinnati Children’s Hospital, to develop virtual reality (VR) training modules. More specifically, we will 1) develop research scenarios that demonstrate how the VR system can be used to investigate behavioral expressions of implicit bias that occur between individuals of different backgrounds (i.e., culture, gender, race/ethnicity, religion, etc.); and 2) develop training scenarios that can be employed to train relevant faculty and administration to reduce behaviors that inadvertently create barriers between themselves and the individual of interest (e.g., faculty member, candidate, student, peer). These will then be translated into training modules in which the user will be immersed in VR and interact with artificially intelligent avatars.

2) The research team has submitted a letter of intent for funding to the UC Center for Clinical & Translational Science & Training for a proposal for $100,000 to support this research and
training development. Invitations for proposal submissions will be in December. The colleagues collaborating with LEAF on this project, Drs. Michael Richardson (Psychology) and Adam Kiefer (CCHMC), have labs equipped with the remaining necessary equipment, as well as the expertise in research based motion capture and VR systems, applied use of such systems for training purposes, and in objective measurement and analysis of human movement and behavior.

3) N/A
4) This work will directly enable LEAF’s efforts to transform the climate at UC and improve recruitment, retention and advancement of members of underrepresented groups by training constituent parties in methods for reducing implicit bias in their decisions, policies, and interactions. This innovative research and training will also offer significant contributions to best practices and the science of diversity that will place UC on the cutting edge of virtual reality (VR) research and training to reduce bias and establish culturally competent interventions that will have a broad and significant impact for academic organizations.

Understanding Sources of Retention and Turnover

A vast literature has explored factors precipitating employee turnover. This research suggests that individuals leave organizations for a variety of reasons that can include “push” and “pull” factors. Push factors typically include sources of job or organizational dissatisfaction, including salary or benefits being less than desired, performance concerns, perceived lack of fit, or feelings of burnout. In contrast, “pull” factors are those representing enticements to move to a different organization due to the promise of a promotion or other more desirable job characteristics (e.g., better pay, position for accompanying partner). Understanding the causes of turnover is a necessary (albeit not sufficient) condition for developing organizational interventions to boost retention of desired employees.

1) The overarching goal of NSF ADVANCE and LEAF is to improve how institutions such as UC recruit, develop, support, and retain women faculty in the STEM disciplines. While the ADVANCE community has disseminated findings relative to recruitment best practices, factors affecting climate, and data on hiring and retention rates, we are not aware of any programs that investigated actual leavers – those women STEM faculty who choose to leave their organizations. Thus, the purpose of the turnover study is to explore how STEM women’s decisions to leave and their post-departure experiences may differ from their male STEM peers and non-STEM colleagues. We will also explore whether these results vary as a function of rank, college, and other situational factors.

2) As reported in the Internal Evaluation section of this document (Internal Evaluation Year 3, Section 14.4, Page 18), LEAF is in a unique position to investigate turnover decisions given the availability of existing faculty data and the procurement of additional data that allows us to better understand drivers of turnover and post-departure experiences. As outlined in the document “Turnover Survey Executive Summary,” our team obtained a list of approximately 900 faculty who left the university since 1989. Using various search tools, our team found email addresses for about 500 of those faculty and contacted them via email to complete a turnover questionnaire. In total, 202 faculty completed this survey. The purpose of the survey was to assess the factors influencing their departure and to understand their experiences after departure. We plan to update the faculty database each year and to continue to collect this data from departing faculty.

3) For a full report of findings from the initial survey, please see the Turnover Study Executive Summary.

4) Data from the turnover survey can be combined with other available data (e.g., climate, retention) and used in myriad ways to paint a more comprehensive picture of faculty experiences and how
those experiences vary as a function of gender, discipline, college, and rank among other variables. Ultimately, we hope to develop a model of turnover and retention that takes into account the idiosyncrasies (e.g., tenure clocks) of the academy that can be used for research and practice. The latter would include top-down programming to address (with academic unit leaders) potential factors influencing retention and best practices that might address those factors.

Analysis of Submission and Persistence

As mentioned above, we are interested in the collaborative networks that allow for productive and successful scholarship. In addition to examining social networks related to these activities and relationships, we are also beginning to develop research questions regarding submission rates and persistence (e.g., resubmissions) with regard to publications and funding proposals. Although publications and funding are critical to career progress, a fair amount of research has demonstrated that female and underrepresented faculty tend to publish less than their male peers in the academy. And while there has been substantial effort to establish equity in the funding of awards across all demographics, women and underrepresented faculty are still much less likely to be the PI on funding submissions (~20–25% of submissions, e.g., NSF 2014).

1) Our broad research aims thus far are to 1) gather data at baseline (pre-award) and at the end of year five regarding submission and persistence rates among STEM faculty, 2) collect interim data from STEM faculty regarding their perceptions of the factors related to the (re)submission efforts (i.e., barriers, motivation, collaboration, discouraging or encouraging reviews, mentorship, work-life integration, etc.), and 3) design experiments to examine how these factors relate to persistence, and the ways in which perceived barriers may be overcome.

2) N/A

3) N/A

4) This work will enable LEAF to measure the impact of its bottom-up efforts (e.g., workshops, learning communities, visiting scholars) at creating an environment that enables and promotes the success of women and underrepresented faculty. Furthermore, it will contribute more broadly to the literature on the science that can inform interventions to reduce the gap in submission rates.

References


A primary goal of UC LEAF is to improve how the university recruits, develops, and retains women and women of color faculty in the STEM disciplines. Achievement of this goal requires that we better understand the reasons why our women STEM faculty leave the university and whether their reasons for departure differ from men STEM faculty or from other men and women non-STEM faculty.

To this end, UC LEAF obtained the names of more than 900 faculty who left the university since 1999. Using various internet databases (e.g., Google LEAF researchers located the email addresses of nearly 500 of those faculty (n=487) who were subsequently contacted to participate in an on-line survey. The survey asked former faculty to report their home department, rank at hire and departure, their satisfaction upon and reasons for leaving UC, and where they went after leaving UC.1 A total of 202 faculty completed the survey, representing a 42% response rate. Seventy-eight of those responding (39%) indicated that they were STEM faculty. Below, we summarize key results.

**Top Reasons for Leaving:** Results suggest that STEM and non-STEM faculty leave for many of the same reasons. In particular, when asked which factors were “very” or “critically” important in their decisions to leave, three out of the top four factors cited by both STEM and non-STEM faculty referenced conditions in their immediate work environment as shown below:

<table>
<thead>
<tr>
<th>Reason for Leaving</th>
<th>STEM</th>
<th>Non-STEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departmental politics</td>
<td>44%</td>
<td>49%</td>
</tr>
<tr>
<td>Lack of fit in department</td>
<td>39%</td>
<td>38%</td>
</tr>
<tr>
<td>Issues with immediate supervisor (e.g., department head, dean)</td>
<td>33%</td>
<td>35%</td>
</tr>
<tr>
<td>Received an offer at another institution that provided a promotion</td>
<td>44%</td>
<td>36%</td>
</tr>
</tbody>
</table>

**STEM versus Non-STEM:** While STEM and non-STEM faculty leave for many of the same reasons, differences between the two groups also emerged. First, results suggest that STEM faculty more likely to leave due to the perceived (poor) quality of students at UC, because of tenure or promotion concerns, and because they received an offer that provided a promotion. In contrast, non-STEM faculty more likely to leave than STEM faculty because of salary and location concerns, and because they received a job offer that allowed them to move into administration.

**Women STEM Faculty:** For those respondents who self-identified as women faculty in STEM (n=25), top reasons for leaving also reflected issues in the immediate work environment. Specifically, 56% of women STEM faculty cited *poor departmental fit* as an important factor in their departure. Other reasons cited included *departmental politics* (46%), *quality of colleagues* (41%), *issues with immediate supervisor* (38%), and *lack of collaborators* at UC (38%). Compared to men in STEM, women were more likely to cite burnout, quality of colleagues, and poor departmental fit as reasons for leaving. Collectively, these findings suggest a need to improve unit-level climate for inclusion and to identify opportunities for women to develop more robust collaboration networks within and across their home departments.

On the pages that follow, we provided detailed results for each survey item.

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1 A full copy of the survey instrument is included in the Appendix
Summary of Results: Survey of Former Faculty

1. Respondent Characteristics

In terms of demographics, of the 195 respondents reporting gender, 52% (n=102) were men and 48% (n=93) were women. The vast majority (83%) are white and not Hispanic/Latino (96%). Only seven respondents (3.5%) were Black/African American and 13 (6%) were Asian. Another 13 (6%) chose not to identify a particular group.

On average, faculty respondents joined the university 19 years ago and were employed for approximately eight years (sd=6.75 years). As shown in Table 1, only 17% of respondents came to UC in the last 10 years (i.e., since Fall 2004); however, more than 50% left in the last 10 years. We recognize that changes in university and unit-level leadership, faculty composition, and policy occur over time; thus, we are encouraged that the majority of responses we received are from faculty who worked at the university relatively recently.

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Joined UC</th>
<th>Left UC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>On or Before July 1994</td>
<td>79</td>
<td>39%</td>
</tr>
<tr>
<td>August 1994 – July 1999</td>
<td>39</td>
<td>19%</td>
</tr>
<tr>
<td>August 1999 – July 2004</td>
<td>50</td>
<td>25%</td>
</tr>
<tr>
<td>August 2004 – July 2009</td>
<td>24</td>
<td>12%</td>
</tr>
<tr>
<td>August 2009 or After</td>
<td>10</td>
<td>5%</td>
</tr>
</tbody>
</table>

1. Faculty Rank at Hire and Departure

To better understand whether faculty experiences while at UC and reasons for leaving varied as a result of rank, as well as career progression, we asked faculty to report their rank at the time of hire and at departure from UC. As noted in Table 2, the majority of faculty (56%) were hired at UC into tenure track positions at the rank of assistant professor. An additional 10%, likely representing the College of Medicine, were hired as Research Assistant Professors. Given that faculty were at UC, on average, 8 years it is not surprising that at departure, the percentage of tenured associate professors and full professors rose from 4.5% and 5.5% to 16% and 25%, respectively.

<table>
<thead>
<tr>
<th>Rank</th>
<th>At Hire</th>
<th>At Departure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visiting</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Field Service/Educator Assistant</td>
<td>12</td>
<td>6.0</td>
</tr>
<tr>
<td>Field Service/Educator Associate</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Field Service/Educator Professor</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Research Assistant Professor</td>
<td>21</td>
<td>10.4</td>
</tr>
<tr>
<td>Research Associate Professor</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Research Professor</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Assistant Professor (tenure-track)</td>
<td>113</td>
<td>56.2</td>
</tr>
<tr>
<td>Associate Professor (without tenure)</td>
<td>16</td>
<td>8.0</td>
</tr>
<tr>
<td>Associate Professor (with tenure)</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>Full Professor</td>
<td>11</td>
<td>5.5</td>
</tr>
</tbody>
</table>
2. College Representation

Respondents were asked to report their home department; however, due to sample size and confidentiality concerns, we aggregated these responses to the college level. As shown in Table 3, more than half (52%) of responses were from faculty representing the three colleges initially targeted by LEAF (A&S, Medicine, CEAS).

<table>
<thead>
<tr>
<th>College</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts &amp; Science</td>
<td>54</td>
<td>26.7</td>
</tr>
<tr>
<td>Medicine</td>
<td>37</td>
<td>18.3</td>
</tr>
<tr>
<td>CEAS</td>
<td>14</td>
<td>6.9</td>
</tr>
<tr>
<td>Business</td>
<td>13</td>
<td>6.4</td>
</tr>
<tr>
<td>Branch Campuses</td>
<td>8</td>
<td>4.0</td>
</tr>
<tr>
<td>Applied Health &amp; Sciences</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Applied Science</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>CCM</td>
<td>10</td>
<td>5.0</td>
</tr>
<tr>
<td>CECH</td>
<td>18</td>
<td>8.9</td>
</tr>
<tr>
<td>Nursing</td>
<td>11</td>
<td>5.4</td>
</tr>
<tr>
<td>DAAP</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Law</td>
<td>12</td>
<td>5.9</td>
</tr>
<tr>
<td>Libraries</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Total</td>
<td>202</td>
<td>100.0</td>
</tr>
</tbody>
</table>

3. Reason for Leaving

A primary goal of the survey was to understand the factors driving faculty turnover. Research suggests that employees leave organizations for a variety of reasons that can include “push” and “pull” factors. Push factors typically include sources of job or organizational dissatisfaction, including salary or benefits being less than desired, performance concerns, perceived lack of fit, or feelings of burnout. In contrast, “pull” factors are those representing enticements to move to a different organization due to the promise of a promotion or other more desirable job characteristics (e.g., better pay, position for accompanying partner).

A list of potential push and pull factors was obtained from the literature as well as from input from UC faculty and administrators. Faculty were then asked to indicate how important each of these factors was in their decision to leave the university. As shown in Table 4, the majority of factors cited as “critically” important to the most factor were those reflecting faculty members’ immediate work environment; that is, at the unit level. These factors include lack of fit in the department, issues with immediate supervisor, and departmental politics. One pull factor, receiving a job offer representing a promotion was reported by 22% of faculty as being a critically important factor in their decisions to leave.
Table 4: Reasons for Leaving

<table>
<thead>
<tr>
<th>Reason for Leaving</th>
<th>1 Not at All Important</th>
<th>2 Slightly Important</th>
<th>3 Very Important</th>
<th>4 Critically Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Salary less than desired</td>
<td>39.6</td>
<td>39.1</td>
<td>10.2</td>
<td>11.2</td>
</tr>
<tr>
<td>b. Benefits less than desired</td>
<td>74.7</td>
<td>20.1</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>c. Long hours</td>
<td>80.0</td>
<td>10.3</td>
<td>5.6</td>
<td>4.1</td>
</tr>
<tr>
<td>d. Geographic location</td>
<td>53.3</td>
<td>22.3</td>
<td>11.7</td>
<td>12.7</td>
</tr>
<tr>
<td>e. Quality of students at UC</td>
<td>58.7</td>
<td>27.6</td>
<td>9.7</td>
<td>4.1</td>
</tr>
<tr>
<td>f. Feeling of burnout in the job</td>
<td>66.3</td>
<td>13.3</td>
<td>12.8</td>
<td>7.7</td>
</tr>
<tr>
<td>g. I was denied tenure or promotion</td>
<td>85.6</td>
<td>3.9</td>
<td>0.6</td>
<td>10.0</td>
</tr>
<tr>
<td>h. I had concerns about future tenure and promotion prospects</td>
<td>69.7</td>
<td>9.6</td>
<td>8.0</td>
<td>12.8</td>
</tr>
<tr>
<td>i. Lack of a personal connection or sponsorship by a senior member(s) of the department or College</td>
<td>66.1</td>
<td>9.9</td>
<td>6.3</td>
<td>17.7</td>
</tr>
<tr>
<td>j. Too much travel</td>
<td>95.8</td>
<td>2.6</td>
<td>0.0</td>
<td>1.6</td>
</tr>
<tr>
<td>k. Lack of research support</td>
<td>48.2</td>
<td>23.1</td>
<td>14.4</td>
<td>14.4</td>
</tr>
<tr>
<td>l. Quality of colleagues</td>
<td>41.5</td>
<td>30.3</td>
<td>13.3</td>
<td>14.9</td>
</tr>
<tr>
<td>m. Lack of collaborators at UC</td>
<td>51.3</td>
<td>23.8</td>
<td>16.1</td>
<td>8.8</td>
</tr>
<tr>
<td>n. Allocation of resources (e.g., space)</td>
<td>62.2</td>
<td>21.8</td>
<td>9.3</td>
<td>6.7</td>
</tr>
<tr>
<td>o. Desire to switch careers, leave academia</td>
<td>92.3</td>
<td>3.1</td>
<td>3.1</td>
<td>1.5</td>
</tr>
<tr>
<td>p. Unreasonable teaching demands</td>
<td>78.8</td>
<td>9.3</td>
<td>7.8</td>
<td>4.1</td>
</tr>
<tr>
<td>q. Unreasonable service/administrative demands</td>
<td>78.4</td>
<td>12.6</td>
<td>4.7</td>
<td>4.2</td>
</tr>
<tr>
<td>r. I received a job offer that provided a promotion</td>
<td>57.1</td>
<td>6.8</td>
<td>14.7</td>
<td>21.5</td>
</tr>
<tr>
<td>s. I received a job offer that allowed me to move into administration</td>
<td>85.3</td>
<td>4.7</td>
<td>4.2</td>
<td>5.8</td>
</tr>
<tr>
<td>t. Lack of employment opportunities for spouse or partner here at UC</td>
<td>80.4</td>
<td>5.7</td>
<td>4.6</td>
<td>9.3</td>
</tr>
<tr>
<td>u. Employment opportunities for spouse or partner existed elsewhere</td>
<td>74.7</td>
<td>7.2</td>
<td>6.2</td>
<td>11.9</td>
</tr>
<tr>
<td>v. Departmental politics</td>
<td>37.6</td>
<td>15.5</td>
<td>17.0</td>
<td>29.9</td>
</tr>
<tr>
<td>w. Did not perceive a good fit with culture or department</td>
<td>47.9</td>
<td>15.6</td>
<td>13.5</td>
<td>22.9</td>
</tr>
<tr>
<td>x. Personal reasons (e.g., health, starting a family)</td>
<td>81.8</td>
<td>3.6</td>
<td>4.7</td>
<td>9.9</td>
</tr>
<tr>
<td>y. Issues with immediate supervisor (department head, dean)</td>
<td>53.6</td>
<td>11.9</td>
<td>8.8</td>
<td>25.8</td>
</tr>
</tbody>
</table>

4. Job Satisfaction at Departure

Faculty were asked to report, on a 7-point scale (1=extremely dissatisfied; 7 = extremely satisfied) their overall level of job satisfaction at UC when they left. These results should provide additional evidence of whether faculty left because of push or pull factors and how motivated faculty may have been to either pursue or consider alternative job offers. As shown in Table 5, overall satisfaction among departing faculty was neutral, meaning they were neither satisfied nor dissatisfied (mean = 3.96). However, there was significant variability among the faculty (sd=2.0). To better understand sources of variability,
examined satisfaction as a function of gender, STEM status, and the intersection of the two. Significant differences emerged, with STEM men faculty being least satisfied at departure and women in STEM being the most satisfied.

**Table 5: Level of Job Satisfaction at Departure**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall</strong></td>
<td>202</td>
<td>3.94</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>96</td>
<td>4.24</td>
<td>1.98</td>
</tr>
<tr>
<td>Women</td>
<td>90</td>
<td>3.62</td>
<td>2.03</td>
</tr>
<tr>
<td><strong>STEM Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEM</td>
<td>73</td>
<td>4.07</td>
<td>2.08</td>
</tr>
<tr>
<td>Non-STEM</td>
<td>119</td>
<td>3.89</td>
<td>1.90</td>
</tr>
<tr>
<td><strong>Gender x STEM</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women STEM</td>
<td>25</td>
<td>4.16</td>
<td>1.70</td>
</tr>
<tr>
<td>Men STEM</td>
<td>46</td>
<td>3.67</td>
<td>2.00</td>
</tr>
<tr>
<td>Women Non-STEM</td>
<td>66</td>
<td>3.95</td>
<td>2.17</td>
</tr>
<tr>
<td>Men Non-STEM</td>
<td>49</td>
<td>4.10</td>
<td>1.98</td>
</tr>
</tbody>
</table>

As a final indicator of former faculty’s satisfaction with and attachment to UC, we asked them to consider whether they would be open to returning to the university as a faculty member. More than one-third (37%) of the faculty said they would be willing to return. In contrast, 63% indicated that they would not return or would only return under certain conditions. Typically, those conditions concerned a dual placement for a spouse or partner, or providing an opportunity for a promotion, greater salary, or research support. Willingness to return did vary (p<.10) as a function of gender and STEM status, with non-STEM women (52%) being most willing to return. This compares to just 32% of women STEM faculty who are willing to return.

5. **Retention Efforts via Competing Offers**

Anecdotal evidence from other LEAF efforts suggests that UC does a poor job incenting faculty to stay when they receive competing offers. The current structure at UC necessitates that a faculty member in hand before UC can produce an actual counter offer, which in many instances would be too late in the process to be an effective retention tool. To better understand the state of practice, we ask faculty “If you left because of a competitive offer from another institution, was UC given an opportunity to provide a competing offer?” Responses varied, with 31% indicating that they had indeed received a competing offer compared to 36% who replied no. An additional 31% said this was not applicable to their situation. Responses generally did not vary by gender X STEM status.

6. **Work Experiences After Leaving UC**

Faculty were asked several questions regarding their work experiences after leaving UC. The vast majority (90%) went to work for another higher education institution. The remaining 10% went to industry or the public sector (9%) or left the workforce altogether (1%).

For those faculty moving to another college or university (n=178), we asked about their rank at hire to determine whether their new position represented a promotion, demotion, or lateral move. The majority (61%) reported that their rank upon hire was the same as their rank at departure from UC. For 24% of
faculty, the new position provided a promotion while 16% reported a demotion in rank. Faculty were then asked to describe the reasons why they took the new position. Representative comments from women STEM faculty, shown below, suggest that opportunities for greater collaboration and research “fit” were most influential in their selection of a new position.

**Collaboration and Research Opportunities**

- Very strong institution and colleagues in my area of research
- There were opportunities for collaboration and networking not available at UC.
- The center where I work is a good fit for my interests and I have been able to collaborate with other researchers in my field as well as continue interdisciplinary projects.
- Flexibility to be innovative; opportunity to work with talented and dedicated people, to serve on boards of worthy community organizations, to learn and to develop new skill sets.
- Great opportunity to enter a different discipline area.
- I got a great offer, the University had a lot of people working on similar areas that I work on.
- I got a really good offer to move to a university that was a lot more well known in my field of study
- Highly collaborative environment with appreciation for all model organisms (bacteria, yeast, mice, humans). NCI designated comprehensive cancer center with a very supportive Cancer Center Director. Many clinical collaborators to translate science.
- Returning to where I had done my postdoc, I knew the research environment was excellent and well-funded, and that I would have more colleagues to collaborate with in my field.
- I was recruited there a group of other researchers from UC. A major factor was the availability of joining a Comprehensive Cancer Center and the resources and collaborators involved.
- More prestigious metabolic research

**Job and Organizational Characteristics**

- I moved to a university with higher standards for teaching and research. I moved to a place where less active faculty did things other than complain and collect their salary. I moved to a place where the union did not set raises, so that performance and excellence could be rewarded. I was subject to incredible salary compression, and no one seemed to care.
- The culture at UC and the medical center was/is male-oriented and did not provide opportunities for women to move into leadership positions. The administrative choices made by a university leadership were poor and dictated by the university board of trustees who also lacked expertise in health care and biomedical research.
- Had a contract that covered about 50-60% of my salary and excellent start up package
- World class institution and better fit
- The institution had vastly lower service requirements, values students, and values ideas. It is also in a major city.
- It was a better institution: more money (salary and research funds), a PhD program, less service, and away from the head.
- The new institution offers professional advancement, job security, and significantly better work-family balance than UC.