

## UD-ADVANCE Social Science Research Proposal

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UD's ADVANCE initiative *Women faculty To Leadership (W2L)* aims to improve the representation and advancement of women STEM faculty. Key W2L objectives are to support administrators as change agents, to improve transparency in policies and procedures, and to mentor women faculty, especially tenured women and women of color, to advance through the ranks and into senior leadership positions.

The proposed social science research project examines gender differences in career satisfaction at UD, with focus on the roles of the department chair, mentoring, collegial support, resource distribution, and transparency in policies and procedures in faculty women's satisfaction. This project will include inter-related quantitative and qualitative investigations to elucidate not only gender differences, but also racial and possibly disciplinary differences, in pathways to career satisfaction.

Research into career satisfaction is an essential first step toward understanding how to improve retention and advancement of women STEM faculty. Literature on faculty satisfaction indicates that women are often less satisfied and more prone to departure than men [2, 4, 5, 10, 17, 29, 31, 64, 65, 73, 81, 83]. Career satisfaction is also related to career advancement. Dissatisfied faculty are more prone to burnout [76], which might partly explain why women faculty are more likely to experience slower career progression than men [8, 11, 15, 16, 30, 46, 47, 55, 62].

The proposed project expands upon a conceptual model developed by Bilimoria, et al. [10], which examines gender differences in perceptions of institutional leadership, institutional mentoring, academic resource distribution, and internal relational supports in job satisfaction. The model and constructs will be described below. For now, it is important to note that Bilimoria's model is at the forefront of research on career satisfaction: Not only is it an early and influential example of research on gender and faculty satisfaction, it goes beyond existing research by looking at gender differences in the *pathways* to satisfaction. The model is ideal for refining and developing W2L interventions because it underscores the importance of leadership effectiveness and mentoring for women's career satisfaction.

The W2L social science study will first retest Bilimoria, et al.'s model and then, using a mixed-methods approach, will expand upon it to address the following research aims.

1. Clarify the perceived relationship between department chairs and mentoring in career satisfaction and test for potential gender differences therein.
2. Explicate whether and to what extent transparency in policies and procedures might affect gender differences in career satisfaction.
3. Test for possible disciplinary effects on gender differences in career satisfaction.
4. Elucidate the effect of race in gender differences in career satisfaction.
5. Illuminate key roots of gender differences in satisfaction through detailed qualitative analysis.

While survey data is well suited to generalizing from sample to population [7], it does not help to understand meaning in context [74]. Survey research also standardizes responses, with little room for individual voice. Combining survey data with qualitative interviews provides the best of all possible worlds, allowing one to generalize findings *and* to account for individual experiences [23].

### ***Bilimoria's Conceptual Model of Pathways to Job Satisfaction (2006)***

Faculty job satisfaction is a multifaceted construct [34, 35, 42, 43]. Bilimoria, et al.'s conceptual model [10] is based on research indicating that perceptions of internal academic resources, internal relational supports, institutional leadership, and institutional mentoring are important factors in career satisfaction. In this context,

***Internal Academic Resources*** are the resources available within a primary academic unit (often the department) such as lab and office space, equipment, research and teaching assistants, technical/administrative support, and research supportive workloads (e.g., course and/or service reductions to allow more research time). Perceptions of access to, and fairness of the distribution of, resources is an important factor in faculty career satisfaction [40, 81]. Several studies report gender disparities in lab/office space, teaching/service loads, and other types of research support [40, 54, 103].

**Internal Relational Supports** are collegial relationships among departmental colleagues, such as those that make a faculty member feel valued, included, supported, and respected by her peers. Such supports are important to career satisfaction, in part, because they are a central element of departmental climate [17] and, in part, because they provide opportunities for collaboration, assistance, and information [24, 36, 37]. Perhaps due to low representation, women faculty report feelings of isolation and, thus, may not receive the same internal relational supports as men [4, 5, 17, 29, 49, 50, 54, 73, 82]. Yet, collegial exchange may be even more important for women than for men [5, 17].

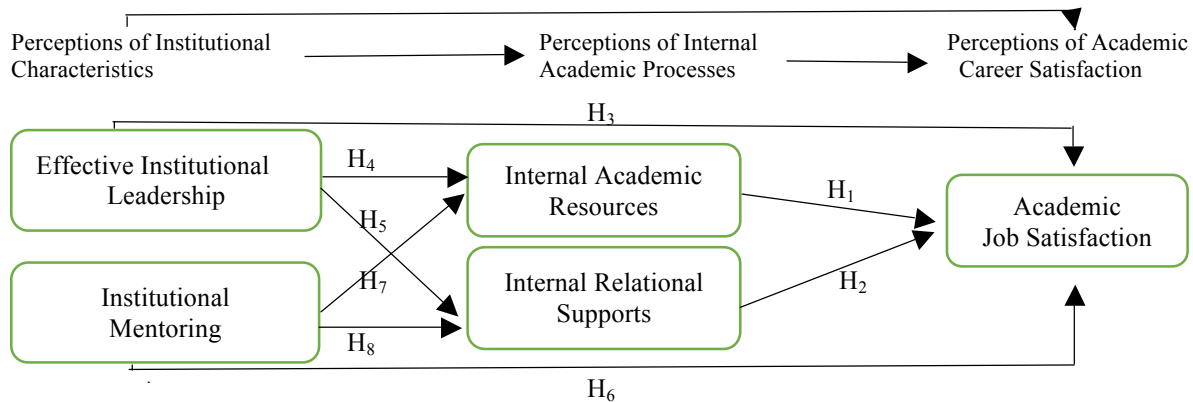
**Institutional Leadership** refers to the effectiveness of the department chair. Department chairs, as distributors of resources and shapers of climate, have significant influence on job satisfaction [1, 4, 5, 11, 12, 72]. Research suggests that women are sometimes excluded from the inner circles of power within a department and, thus, may not benefit from chair leadership to the same extent as men [4, 74, 103, 114].

**Institutional Mentoring.** Mentoring is defined as a relationship between a more experienced colleague and a less experienced protégé for the purpose of the protégé's career development [45]. Mentoring can be formal (institutionalized with formal policies and procedures) or informal (mentees choose their own mentors). Numerous studies report the importance of mentoring (formal and informal) for objective and subjective career success and that women tend to have fewer network connections and, thus, fewer mentoring opportunities than men [24, 28, 74, 114].

**Hypothesized Model.** Based on the above research, Bilimoria, et al. propose 8 hypotheses [10, pp. 357-358] that aim to spell out potential pathways to career satisfaction (Figure 1-S).

- H<sub>1</sub>: Perceptions of internal academic resources will be positively related to ratings of job satisfaction.
- H<sub>2</sub>: Perceptions of internal relational supports will be positively related to ratings of job satisfaction.
- H<sub>3</sub>, H<sub>4</sub>, and H<sub>5</sub>: Perceptions of institutional leadership will be positively related to ratings of job satisfaction (H<sub>3</sub>), internal academic resources (H<sub>4</sub>), and internal relational supports (H<sub>5</sub>).
- H<sub>6</sub>, H<sub>7</sub>, and H<sub>8</sub>: Perceptions of institutional mentoring will be positively related to internal academic resources (H<sub>7</sub>), and internal relational supports (H<sub>8</sub>), and ratings of academic job satisfaction (H<sub>6</sub>).

**Figure 1-S. Bilimoria's (2006) Hypothesized Model**



Bilimoria, et al. also propose the following two gender-related hypotheses.

- H<sub>9</sub>: The path coefficients from perception of institutional leadership to academic resources (H<sub>4</sub>) and to job satisfaction (H<sub>1</sub>), will be smaller for female than for male faculty.
- H<sub>10</sub>: The path coefficients from perceptions of leadership and from mentoring to internal relational supports (H<sub>5</sub>, H<sub>8</sub>) and to job satisfaction (H<sub>2</sub>), will be larger for female than for male faculty.

**Methodology.** The above model was tested using data from a faculty climate survey at a single Midwestern private research university. Questionnaire items asked respondents to rate aspects of career development, academic resources, departmental climate, institutional leadership, and career satisfaction on a four point Likert scale. Results from all full-time non-medical school faculty respondents (39% response rate) were used in the study. The model was tested using a path analytic approach. To test gender related hypotheses, path analytic models for female and male faculty were tested separately.

**Results.** Bilimoria and colleagues found that both men and women view leadership and mentoring as influencing job satisfaction, with internal academic resources and internal relational supports as mediators. (H<sub>1</sub>, H<sub>2</sub>, H<sub>4</sub>, H<sub>5</sub>, H<sub>8</sub> were confirmed.) They found no *direct* relationship between leadership and job satisfaction (H<sub>3</sub>), nor between mentoring and satisfaction (H<sub>6</sub>). While they did find a connection between perceptions of mentoring and perceptions of resources (H<sub>8</sub>), there was no significant relationship between mentoring and internal academic resources (H<sub>7</sub>). As predicted, the following gender effects were supported by the data. The path coefficients from leadership to resources to job satisfaction was smaller for women than for men (H<sub>9</sub>). The path coefficients from leadership to job satisfaction, as mediated by relational supports, were larger for women than for men (H<sub>10</sub>).

The above results are informative for W2L interventions. They suggest that interventions targeting chairs and directed at improving mentoring, resource distribution, and internal relational supports could improve satisfaction, retention, and advancement of women STEM faculty at UD.

### ***W2L Model & Hypotheses***

The first step of the W2L social science study will be to ***retest Bilimoria, et al.'s original 10 hypotheses***. Retesting the model will offer independent confirmation of model constructs and will reveal the extent to which the model generalizes to a different type of institution (an East Coast suburban research I university). In cases where the results don't generalize, we can identify factors that may be unique to faculty satisfaction at UD. Second, we will ***expand upon the model and findings*** as described below.

***Department Chairs and Mentoring.*** A deeper understanding of the relationship between department chairs and mentoring is needed. Under our prior ADVANCE-PAID project (see main proposal, Section I: Results of Prior NSF Support), a formal mentoring program for assistant professors was developed within targeted UD departments. Mentors are assigned and overseen by chairs, a model that is now being adopted by other colleges in the university. W2L enhances existing mentoring efforts by adding interventions for associate professors and for women faculty of color. Bilimoria, et al.'s original model did not postulate a relationship between chairs and mentoring, though their results suggest a small but significant association between leadership and mentoring for men but not for women. We will, thus, test the following hypotheses (depicted in Figure 2-S):

- H<sub>11</sub>: Perceptions of institutional leadership will be positively related to perceptions of mentoring.
- H<sub>12</sub>: The path coefficient from perceptions of leadership to mentoring will be smaller for female than for male faculty.

***Clarity of Policies and Procedures.*** A recent UD faculty climate survey indicates that all faculty groups (regardless of race, gender, or discipline) are concerned about lack of transparency in policies and procedures (union survey). Transparency occurs when policies and procedures (promotion and tenure documents, workload policies, family friendly policies, etc.) are clearly stated, readily available, and uniformly communicated [106]. We hypothesize a relationship between transparency and each existing model construct. Research has shown that retention, advancement, and satisfaction of faculty are positively associated with transparency [5, 65, 114]. An element of effective leadership (department chairs) and of institutional mentoring is the communication and interpretation of policies and procedures [28, 106, 114]. Transparency can make a difference in resource distribution, such as teaching and research assistants, adjusted workloads, and other types of support [5, 62, 65, 66]. Policies and procedures, especially the elements that are implicit or not clearly stated, are often communicated through internal relational supports [103, 114].

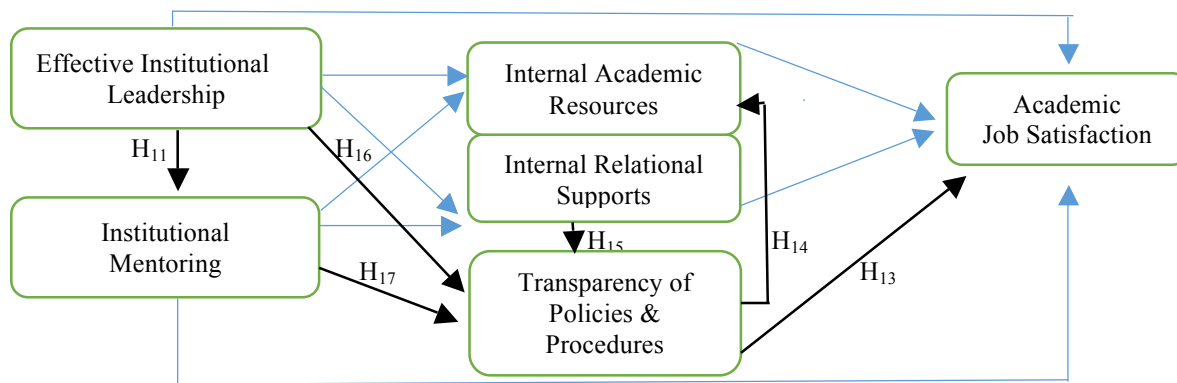
- H<sub>13</sub>, H<sub>14</sub>: Perceptions of transparency will be positively related to career satisfaction ratings and to perceptions of internal academic resources.
- H<sub>15</sub>: Perceptions of internal relational supports will be positively related to perceptions of transparency.
- H<sub>16</sub>: Perceptions of effective leadership will be positively related to perceptions of transparency.
- H<sub>17</sub>: Perceptions of institutional mentoring will be positively related to perceptions of transparency.

Research shows that men often have greater access to the internal power structures within a department (e.g., chairs), mentoring, and internal relational supports than women [5, 65, 103, 114]. We expect that the relationship between leadership, mentoring, and internal relational supports, on one hand,

and transparency, on the other, will be greater for men than for women. Due to these lower levels of perceived transparency for women, the impact of transparency on internal relational supports will also be smaller. Assuming  $H_{13} - H_{17}$ , men are, thus, more likely than women to view policies and procedures as transparent.

- $H_{18}$ : The path coefficients from institutional leadership, institutional mentoring, and internal relational supports to perceived transparency ( $H_{15} - H_{17}$ ) will be smaller for women than for men.
- $H_{19}$ : The path coefficient from transparency of policies and procedures to internal academic resources ( $H_{14}$ ), will be smaller for women than for men.

**Figure 2-S. W2L Hypothesized Model of Academic Job Satisfaction.** This figure shows proposed expansions to Bilimoria, et al.'s model, with their original hypotheses in light blue. New hypotheses are labeled and are in bold.



**Effects of Discipline.** Bilimoria's model does not examine the effect of discipline on gender differences in career satisfaction. Due to our interest in STEM faculty, we will examine potential disciplinary differences in the hypothesized pathways to faculty satisfaction. Research on faculty satisfaction by discipline is equivocal. Some studies report that women in fields in which they are below critical mass are less satisfied than those who are proportionally well-represented [106, 112]. Other research suggests no disciplinary differences [29]. We will look into the effect of discipline by separately testing path analytic models for faculty in STEM, in the social sciences, and in the arts & humanities.

**Race and Faculty Job Satisfaction.** The under-representation, low retention, and slower advancement of faculty of color is a national problem [38, 39, 57, 61, 62]. Not surprisingly, studies report that faculty of color, when compared to white faculty, are less satisfied with nearly every aspect of their job [4, 32, 33, 78, 82, 83, 104, 107]. Common themes include isolation and associated lack mentoring and internal relational support; concerns about transparency in promotion and tenure policy; lack of respect, marginalization, and implicit or explicit racism from departmental colleagues; dissatisfaction with or distrust in institutional leadership (such as department chairs) and with resource distribution (e.g., high teaching and service loads) [9, 31, 32, 33, 49, 50, 54, 77, 83].

An important part of W2L is to develop interventions designed for women faculty of color. Relatively little research has been done on race and faculty satisfaction and even fewer studies focus on women faculty of color [82, 83]. The experiences of women of color, when recorded, usually get buried in studies that focus on the broader categories of gender or race. An essential contribution of this study will be to give a voice to faculty satisfaction issues faced by women faculty of color at a research 1 university.

**Methodology**

The W2L research component will include two interrelated and complementary studies. The first will be a quantitative investigation based on a UD survey of faculty worklife. The second will add qualitative interviews with a smaller sample of faculty to permit a deeper analysis of observed gender differences and to permit an examination of race (which likely cannot be studied quantitatively due to small sample size) as a factor in gender differences in career satisfaction. This sequential design (survey followed by interviews) provides a key benefit of triangulating data sources; the results from one type of data can

develop and inform the other. Perhaps more importantly, the combination of quantitative and qualitative data will provide richer, more valid findings, as each type can help offset the limitations of the other [23].

For the quantitative study, a UD climate survey will be administered to all full time faculty (N = 909 tenured/tenure-track faculty; 34.2% female) in spring 2014 and every other year thereafter. Results from the 2014 survey will be used for this study. The questionnaire is modeled after University of Wisconsin's faculty climate survey [111]. The survey has been revised to fit the context and culture of UD and to include all of Bilimoria, et al.'s questionnaire items. Expected response rate is between 30-60% (OIRE). To encourage high participation, the survey solicitation will be sent (with follow-ups) by the provost's office. The conceptual model and model fit will be tested using a path analytic approach and the indices specified by Bilimoria, et al. (chi-square; the ratio of chi-square divided by degree of freedom; comparative fit index; goodness-of-fit index; incremental fit index, and the normal fit index and RMSEA). Discriminant validity of constructs will be assessed by conducting chi-square differences tests.

For the qualitative interviews, a purposive sample of approximately 50 faculty members explicitly chosen to include diversity in race, field of study, and gender will be selected. Most importantly, we will endeavor to recruit sufficient numbers of women faculty of color (Asian, Black, Hispanic women at UD, N = 62) to allow us to explore the role of race in faculty job satisfaction. Subjects will be recruited via a follow-up solicitation from the provost's office.

Interviews will ask participants to discuss their access to formal and informal mentoring, the effectiveness of mentoring received, ways mentoring could be improved, and the extent to which chairs can and do facilitate mentoring efforts. The interviews will also delve deeper into the importance of transparency in career success by asking more detailed questions about which policies and procedures need clarification and why; the extent to which they have received support in interpreting policies and procedures from chairs, mentors and/or internal relational supports; and whether transparency has made a difference in their perceptions regarding distributions of academic resources. Finally, the interviews will include questions about how race factors into faculty members' personal experience at UD, whether they have witnessed the impact of race in the experiences of colleagues of color at UD, and how they characterize the climate of inclusion at the university and in their specific department. We will also ask specifically about experiences with department chairs, mentoring, and access to academic resources to begin to develop an understanding of if and how the specific gendered pathways to faculty satisfaction differ for faculty of color. While we will not be able to generalize any findings about racial differences, this will provide a starting point to assess if and how race may matter (either independently or in combination with gender) for academic job satisfaction.

Interviews will be audio-recorded and transcribed verbatim. Transcripts will be coded using NVivo qualitative data analysis software using a combination of coding strategies, including in vivo, descriptive, structural, pattern, and hypothesis coding [75].

**Broader Impacts.** The proposed research project has been designed to inform W2L objectives and interventions. This information will not only help us to refine interventions focused on leadership effectiveness, mentoring, as well as resource distribution and transparency of policies and procedures; through the dissemination of our results (via presentations and publications), it can inform interventions at other institutions. Furthermore, it will contribute to an under-developed discourse and literature on the advancement of tenured women and women faculty of color, especially those in STEM disciplines.

**Intellectual Merit.** We retest an influential model of gender differences in career satisfaction for generalizability to a different institution – and to explore what is unique about the faculty experience at UD. We build upon the existing literature by adding extra hypotheses and model constructs related to department chairs, mentoring, transparency, discipline and race. Little research has been done on racial differences in faculty satisfaction and even less has been done on race and gender differences in faculty satisfaction. While prior research has relied exclusively on quantitative data, our study will provide more nuanced understandings of the gendered pathways to career satisfaction among faculty by incorporating qualitative interviews.

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