

**REPORT SUMMARY**

***Priming the Pipeline:  
Understanding the Obstacles and Incentives  
for Considering an Academic Career***

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# **REPORT SUMMARY**

## **Background**

The goal of the Pipeline Project, part of the Stanford Campus Diversity Initiative funded by a grant from the James W. Irvine Foundation, was to analyze the factors that affect academic career choices, particularly of underrepresented minorities and women, with the goal to increase faculty diversity. In 2004, the faculty, the graduate students, and the junior and senior undergraduates at Stanford were surveyed (all faculty and for undergraduate and graduate students, all underrepresented minority students and equal numbers of non-URM students). The quantitative and qualitative responses from these groups are presented in the full report. Excerpted below are the summaries of findings from each of the five major sections of the study, the summary of conclusions and recommendations from the Executive Summary, and the concluding paragraph.

## **Summary of Findings**

### ***Section A: Decision to Attend Graduate School***

#### **Pursuing Graduate School**

Ninety-six percent of the undergraduate respondents reported having at least some interest in attending graduate school (for both PhD and professional degrees).

#### **Influential Individuals**

Interest in graduate school was fueled by a single event or individual for approximately one-quarter of the undergraduates and one-half of the graduate students, with others being influenced by multiple people or events.

The most influential people for the undergraduates and graduates were (most common responses, in descending order of frequency):

- Faculty members (not formal advisor)
- Formal faculty advisors
- Fathers
- Spouses
- Employers

The common characteristics and behavior of the people who positively influenced the students to pursue graduate school included (most common responses, in descending order of frequency):

- High level of education
- Support and encouragement
- Self-confidence
- Mentorship
- Hardworking, successful, committed to work
- Intellectual curiosity
- Commitment to teaching
- Worthy of respect, trustworthy
- Caring/compassion

The ways that individuals influenced the undergraduates and graduates included (most common responses, in descending order of frequency):

- Encouraged
- Gave confidence
- Supported
- Introduced to academia/research
- Introduced to specific discipline/topic
- Mentored

### **Influential Events/Experiences**

For undergraduates and graduate students, positive influential events or experiences in the graduate school decision included (most common responses, in descending order of frequency):

- Coursework
- Work experience
- Availability of graduate school funding
- Research experience
- Access to future career opportunities

Events and experiences that negatively influenced students included (most common responses, in descending order of frequency):

- Undergraduate grade point average
- Undergraduate research experience (negative experience or a lack of research opportunity)
- Negative experience with coursework
- Lack of graduate funding

### **Race/Ethnicity and Gender**

Some significant differences exist between groups regarding the influences to attend graduate school (complete results are presented in Appendix VI). Underrepresented minority graduate students were more likely than non-minority graduate students to be influenced by a former employer, and female graduate students were more likely than their male counterparts to be influenced by non-advising faculty. Underrepresented minorities were also found to be more likely to be positively influenced to attend graduate school by receiving funding and by the realization that their career opportunities would improve with a graduate degree. Underrepresented minority undergraduates were more likely than non-minorities to feel unprepared for graduate school.

## ***Section B: Graduate School Experience***

### **Preparation**

Most faculty members and doctoral students felt prepared when they began their graduate school programs. Fewer, approximately half, of the undergraduates felt prepared for graduate school.

### **Cohort Comparisons**

Most of the current faculty and current doctoral students in the samples felt more able than their graduate student peers.

### **Graduate School Satisfaction**

The current faculty and to a lesser extent, current doctoral students, felt satisfied with their graduate school primary advisor.

### **Stress**

More than 50% of the faculty found graduate school to be “stressful”, although approximately one-third of current faculty reported that graduate school experience was not stressful at all.

### **Graduate School Attrition**

The majority of the current faculty sample (80%) never considered dropping out of graduate school. For those who did contemplate leaving graduate school, some of the reasons included (most common responses, in descending order of frequency):

- Academic issues
- Interpersonal problems
- Low self-confidence
- Not engaged in work
- Health issues
- Family issues
- Low future salaries
- Tight job market
- Politics in academia

### **Recommended Improvements to the Graduate School Experience**

Some of the recommendations to improve the graduate school experience made by the graduate students and faculty include:

- Improved funding and financial support
- Faculty training (general teaching skills, funding management, student management, mentoring/advising, academic politics)
- Diversify faculty and graduate student body
- Foster intellectual diversity
- Foster a collegial environment
- Improve the social and cultural climate

### **Race/Ethnicity and Gender**

Some of the findings in this section were shown to be statistically significant when the results were broken down by race/ethnicity and gender (complete results are reported in Appendix VII). Underrepresented minority faculty were significantly more likely than non-minority faculty to be satisfied with their overall relationship with their advisor while they were in graduate school. Current female faculty members felt less prepared for, were more stressed during, and were more likely to consider dropping out of graduate school than their male colleagues. Current female graduate students were also more stressed than male graduate students. In addition, female graduate students were significantly less likely than male graduate students to feel academically capable.

## ***Section C: Interest in Academic Careers***

### **When Interest in Academic Careers Developed**

When the current Stanford faculty were undergraduates, 30% of them were “very interested” in pursuing an academic career. When they were in graduate school, this number increased to approximately 60%. Seventy (70%) of the current graduate student sample reported being “very interested” or “interested” in pursuing an academic career.

### **Academic Career Influences: People**

Seventy percent of the faculty sample reported that they were influenced to go to graduate school by a specific individual such as (most common responses, in descending order of frequency):

- Undergraduate faculty
- Graduate school faculty member (not advisor)
- Father
- Post-doc professor/mentor

The faculty explained that the people who influenced them did so through role modeling, actively encouraging them and engaging in mentoring behavior.

### **Student Recommendations**

Undergraduate and graduate students recommended various changes to minimize the perceived obstacles to academic careers, including:

- Improve role modeling
- Increase number of minority faculty members
- Decrease racism and sexism in campus environment
- Improve programs to encourage better work and life balance for faculty
- Make university environment more collegial
- Develop programs to teach about academic careers
- Offer more teaching experience for students
- Improve funding for graduate school

### **Race/Ethnicity and Gender Differences**

Underrepresented minorities and women were significantly different than their counterparts in many ways regarding academic careers (complete results are found in Appendix VIII).

Underrepresented minority faculty members were more likely than non-minority faculty to have been influenced to pursue an academic career by an event or experience rather than a person.

There were also significant race/ethnicity and gender differences in the obstacles that students anticipate on the road to becoming and being successful as an academic. Women graduate and undergraduates reported expecting that gender issues would be obstacles to an academic career. Female graduate students were also more likely than male graduate students to see work and family issues as academic career obstacles.

Underrepresented minority undergraduate and graduate students were more likely than non-minorities to report that racial/ethnic issues would be academic career obstacles. When we analyzed this by gender, we found that underrepresented minority females were significantly more likely than underrepresented minority males to report this. Underrepresented minority graduate students were also more likely to report that lack of intellectual confidence is a potential academic career obstacle.

There were many significant group differences regarding the extent to which aspects of an academic career were considered appealing. Underrepresented minority graduate students were significantly more likely than non-minority students to find the following academic career aspects appealing:

- Obtaining research funding
- Applying academic knowledge to society in important and relevant ways
- Teaching graduate students

Female students were more likely than male students to consider the following academic career aspects appealing:

- Teaching undergraduates
- Applying academic knowledge to society in important and relevant ways
- Being a mentor

### **Academic Career Influences: Events and Experiences**

Slightly more than 40% of each of the three samples in the study (faculty, graduate and undergraduate) reported that an event or experience crystallized their desire pursue an academic career. Examples include (most common responses, in descending order of frequency):

- Work experience

- Coursework
- Project work
- Teaching experience
- Financial support
- Participation in special programs

### **Appealing Aspects of Academic Careers**

According to the undergraduate and graduate students, the most appealing aspects of an academic job include (most common responses, in descending order of frequency):

- Having a flexible work schedule
- The opportunity to create knowledge
- Being a mentor
- Applying academic knowledge to society
- Teaching undergraduates and graduate students
- Doing research

The least appealing aspects of an academic career include (most common responses, in descending order of frequency):

- The process of tenure and promotion
- Academic workload expectations
- Obtaining research funding
- Academic salary levels

### **Students Perceived Obstacles to Academic Careers**

Graduate and undergraduate students perceived the following obstacles to becoming and being successful as an academic (most common responses, in descending order of frequency):

- Limited academic positions
- Lack of dedication to the field
- Real and opportunity costs of training
- Fear of failure
- Lack of requisite skills
- Intellectual insecurity
- Length of training

## ***Section D: Academic Career Experiences***

### **Academic Preparation**

Our findings show that most (75%) of the faculty felt very prepared for their academic positions when they arrived at Stanford.

### **Career Challenges**

Despite feeling prepared, the faculty reported facing various career challenges, including (most common responses, in descending order of frequency):

1. The tenure process
2. Politics in academia
3. Family obligations
4. Low salary

Faculty reported that the following factors were not a challenge to their academic career (most common responses, in descending order of frequency):

- Lack of support
- Lack of dedication to field
- Length of training

### **Enjoyable and Satisfying Aspects of Academia**

The aspects of the academic career that the faculty find the most enjoyable and satisfying include:

- Having intellectual independence
- Being challenged intellectually
- Doing research /scholarship
- Having a flexible work schedule
- The academic lifestyle
- Lifetime employment

Tenured faculty in the sample were significantly more likely than non-tenured faculty to report being satisfied with teaching undergraduates.

The least satisfying aspects of academia include (most common responses, in descending order of frequency):

- Salary levels
- The tenure process
- Obtaining research funding
- Work and family balance
- Academic workload expectations

### **Satisfaction with Stanford**

Approximately 75% of the Stanford faculty were “satisfied” or “very satisfied” in coming to Stanford.

### **Stress in Academic Careers**

Almost 75% of the Stanford faculty reported that their academic career was “stressful” or “very stressful”. The main stressors for the faculty included (most common responses, in descending order of frequency):

- Grants and funding
- Work and family
- The tenure process
- Workload and time management
- Personal and political issues
- Housing costs

### **Career Help**

The faculty reported that the following personal attributes, people, and experiences helped them in their academic career (most common responses, in descending order of frequency):

#### **Personal Attributes**

- Perseverance
- Personality
- Confidence
- Academic passion
- Dedication
- Good judgment

#### **People**

- Mentors
- Colleagues
- Advisors
- Faculty
- Students
- Family

### **Experiences**

- Research experience
- Funding approval
- Collaborations
- Awards/recognition
- Background
- Job experience

### **Stanford Success**

To be successful at Stanford, the faculty reported that the most important factors include:

- Understanding the unspoken rules of academia
- Having the right mentor
- Being able to negotiate well
- Being well-liked by colleagues
- Having good social skills
- Being confident
- Being part of the informal department network

### **What They Would Have Done Differently**

Faculty reported that they would have done the following things differently if they could (most common responses, in descending order of frequency):

- Chosen a different route or trajectory
- Been a better self-advocate
- Worked at a different institution
- Balanced work and family differently

### **What They Wished They Knew**

The faculty in our study reported that they wished they had knowledge of various topics before becoming a professor such as (most common responses, in descending order of frequency):

- Career management
- Teaching and research
- Interpersonal relationships
- Personal issues

### **Racial/Ethnic and Gender Differences**

There are aspects of the academic career in which underrepresented minorities and women differ significantly from the rest of the faculty (Appendix IX).

Underrepresented minorities and women faculty share some similar beliefs and experiences regarding their academic careers.

Some issues that were significantly more challenging for underrepresented minorities and women faculty members were:

- The tenure and promotion process
- Issues related to my race/ethnicity

Underrepresented minority males were significantly more likely than underrepresented minority females to report being challenged by race and ethnicity issues.

Additional obstacles that were significantly more challenging to females than males were:

- The politics of academia
- The need to relocate for career advancement
- Issues related to my gender
- Family obligations
- Lack of support from my family and friends



- Concern about not succeeding
- Not having the requisite skills
- Not feeling intelligent enough
- Not feeling dedicated enough to my field

Underrepresented minority and women faculty are significantly less likely than their counterparts to be satisfied with the process of tenure and promotion. Underrepresented minority males were significantly more satisfied than underrepresented minority females with the process of tenure and promotion.

- Additionally, female faculty members are less likely to report satisfaction with:
  - Salary levels in academia
  - The ability to augment income with work outside the university
  - Academic work load expectations
  - The ability to balance work and family

Both underrepresented minority and female faculty are significantly more likely than other faculty to consider the following as important to career success at Stanford:

- Understanding the unspoken rules of academia
- Having the right mentor
- Being able to negotiate well
- Being liked by your colleagues
- 

Underrepresented minority males were significantly more likely than underrepresented minority females to report the importance of “understanding the unspoken rules of academia” as important to career success at Stanford.

In addition, female faculty were significantly more likely to report that the following are important to career success at Stanford:

- Having good social skills
- Being confident
- Being part of the informal network in your department

Female faculty were also significantly more likely than male faculty to report that the tenure process was difficult and that their academic career has been stressful.

## ***Section E: Work and Family***

### **Students**

The overwhelming majority of graduate students in our study reported a high level of commitment (26% “committed” and 64% “very committed”) to pursuing a career upon completion of their studies. However, family issues are a significant issue facing those who are pursuing an academic career, particularly underrepresented minorities and women.

### **Family Commitments**

Our study shows that 40% of the doctoral student sample reported that their current family commitments (including marriage, child care and elder care) have a “huge impact” on their school and work commitments.

### **Timing of Children and Career Demands**

Fifty-four percent of the current doctoral students in our sample reported that they anticipate problems with the timing of children and career demands. In the undergraduate sample, 42% reported that they envisioned a problem with the timing of children and career demands. The challenges anticipated by the graduate and undergraduate students include (most common responses, in descending order of frequency):

- Conflicting time commitments during early career and early parenting phases
- Financial burdens
- Negotiating parenting responsibility with partner
- Finding quality childcare
- Affording quality childcare

### **Work and Family in Future Career**

More than half (54%) of the doctoral student respondents reported that they anticipated having difficulty integrating work and family in their future careers.

### **Effect of Parenthood on Career**

One-third of the undergraduate and doctoral students reported that they anticipated parenthood will have a “positive” or “very positive” effect on their career. Another 1/3 of both samples reported that they expect parenthood to have a “negative” or “very negative” effect on their career. The final third were uncertain of the potential impact.

### **Faculty**

Thirty-two percent of the Stanford faculty respondents reported that they experienced “significant problems” integrating their career and family/personal life. An additional 50% of the faculty reported having “some problem”. Some of the problems encountered by faculty members include (most common responses, in order of frequency):

- Lack of time
- Family life negatively impacted
- Work negatively impacted
- Low academic salaries
- Quality childcare hard to find
- Quality childcare unaffordable

### **Work and Family Advice to Future Faculty**

The faculty advice that was most frequently offered to students and post-docs about integrating work and family centered on planning and preparation. The advice includes (most common responses, in descending order of frequency):

- Make conscious and deliberate work and family decisions
- Choose a very supportive spouse
- Strike a good balance between work and family
- Work to change the system

### **Advice for the University**

The faculty sample was asked to recommend ways that the university can help faculty balance their work and family obligations (most common responses, in descending order of frequency):

- More day care options
- Flexibility and clarity in tenure system
- Flexible work schedules
- Limit meetings and commitments

Others (mostly men but also one woman) argued that it is an individual's responsibility and that the university should not be involved in the issue at all.

### **Race/Ethnicity and Gender Differences**

Both underrepresented minority and women graduate students were significantly more likely than other graduate students to report being committed to pursuing a career upon completion of their studies (Appendix X).

Female graduate students were significantly more likely than male students to report that their family commitments have a negative impact on their school and work commitments. Female undergraduate and graduate students were also more likely to envision problems in the timing of

children and career demands and the integration of career plans with a family life. In addition, they are also more likely to expect a negative effect of parenthood on their career.

## **Conclusions and Recommendations**

The purpose of the Pipeline Project was to understand the obstacles and barriers to pursuing academic careers for underrepresented minorities and women. In focusing on the areas that are most salient to underrepresented minorities and women, we also identify issues of concern for other students and faculty. In doing so, we hope to develop the most relevant strategies for attracting and retaining the best and the brightest students to academia, including those in currently underrepresented groups.

1. As underrepresented minority students were shown to go to graduate school because of a pivotal non-academic experience, universities should provide work opportunities for underrepresented minority students that allow them to interact with individuals engaged in academic work, especially individuals who clearly enjoy their work and actively encourage students to follow in their footsteps.
2. Funding is an important issue to minority students. Universities should publicize the fact that funding is usually available to fully cover costs of graduate education (unlike professional schools), as well as the fact that once a Ph.D. is completed, an academic career could be both a desirable and *attainable* career trajectory. This is important information to share with talented potential graduate students.
3. Critical mass is an important issue for minorities and women. Increasing diversity of the faculty and student populations would increase the number of available role models, particularly ones who share the same race/ethnicity/gender characteristics of the population to be attracted.
4. Minorities and women reported more difficulty envisioning themselves as academics. Universities need to recognize the importance of inviting and encouraging these individuals to see themselves in the role of faculty and, again, increase the representation of women and minority faculty as role models.
5. Being acquainted with the academic environment is important to increasing the numbers of women and minorities in academia. Universities should provide opportunities, such as summer research programs, for undergraduate minority and female students to become involved in applied research and/or teaching in order to allow them to envision and experience the aspects of an academic career that most appeal to them.
6. Mentoring is essential; encourage faculty to be mentors.
7. Provide seminars, workshops, and a website for both students and faculty on topics of concern, including issues, opportunities, and strategies for success in higher education.
8. Provide a support group program/seminar series to encourage the normalization of the minority/women experience for both students and faculty.
9. Provide good information to graduate student and faculty women and minorities about the processes of academic success.
10. Alert students and junior faculty to the importance of relationship building; reputation management both inside and outside of the university is critical to their achieving academic success.

11. Provide good quality, available and affordable child care, as well as salaries adequate to afford child care and other services necessary to provide a healthy work/life balance.
12. Examine policies with respect to tenure clocks and whether there may be real costs of slowing the tenure clock for faculty who choose that option.
13. Consider the possibility of alternative career trajectories for female and minority faculty who are unable to follow the traditionally prescribed timeline.
14. Address the “two body” issue by providing more dual career assistance, as this is particularly an issue for women faculty, who have traditionally been the ones who relocate due to spouse/partner careers.
15. Allow students to see that there are women and minorities who have succeeded in academia, done it well, and enjoyed it, without significantly sacrificing their personal lives.

Developing and implementing strategies to address the recommendations that evolved from the Pipeline Project research will take time and resources. Universities dedicated to increasing the presence, participation, and success of women and members of minority groups in their academic ranks will need to change institutional cultures and allocate resources to ensure a healthy pipeline of future generations of talented and diverse students and faculty.