

Columbia University Senate
Commission on the Status of Women

February 24, 2023

**The Advancement of Women Faculty through the Academic Ranks
Graduate School of Business Pipeline Study**

The Commission on the Status of Women worked with Dean Costis Maglaras and the Office of the Provost's Faculty Affairs Division to study the advancement of women faculty in the Graduate School of Business over the past 15 years. This work follows previous studies of the Arts and Sciences (2001 and 2015), Vagelos College of Physicians and Surgeons (2018), School of Law (2019), and Mailman School of Public Health (2021). This report summarizes our findings and our recommendations.

Considering the periods 2007-2008 and 2021-2022, the Commission found that:¹

1. The number of faculty increased by 12 percent between 2007-2008 and 2021-2022 (see Table 1). The number of women faculty more than doubled (from 16 to 38) and the number of men faculty decreased by 6 percent (from 112 to 105) (see Table 1).
 - a. Tenured faculty increased by 24 percent, with a 71 percent increase in women tenured faculty (from 7 to 12) and an 18 percent increase in men tenured faculty (from 56 to 66).
 - b. Faculty on tenure track decreased by 21 percent. Women on tenure track more than doubled (from 8 to 21) and men on tenure track decreased by 50 percent (from 50 to 25).
 - c. Non-tenure track faculty increased from 7 to 19. Women on non-tenure track increased from 1 to 5, and men on non-tenure track increased from 6 to 14.

¹ The data used for the analyses are snapshot data taken on November 1 of academic years 2007-08 and 2021-22. These data were drawn from PeopleSoft and reviewed by the Office of Academic Appointments.

**Table 1: Columbia University Graduate School of Business
Growth in Faculty by Rank and Gender between 2007-08 and 2021-2022**

	Women			Men			Total		
	2007-2008	2021-2022	Growth	2007-2008	2021-2022	Growth	2007-2008	2021-2022	Growth
Tenured	7	12	71%	56	66	18%	63	78	24%
Tenure-Track	8	21	163%	50	25	-50%	58	46	-21%
Non-tenure track	1	5	400%	6	14	133%	7	19	171%
Total	16	38	138%	112	105	-6%	128	143	12%

2. Women faculty accounted for 27 percent of total faculty in 2021-2022, as compared with 13 percent in 2007-2008 (see Table 2).
 - a. Women accounted for 15 percent of tenured faculty in 2021-2022, up from 11 percent in 2007-2008.
 - b. Women accounted for 46 percent of tenure track in 2021-2022, up from 14 percent in 2007-2008.
 - c. Women accounted for 26 percent on non-tenure track in 2021-2022, up from 13 percent in 2007-2008.

**Table 2: Columbia University Graduate School of Business
Share of Faculty by Gender for different Rank in 2007-08 and 2021-2022**

	2007-08					2021-22				
	Women	Men	Total	Women %	Men %	Women	Men	Total	Women %	Men %
Tenured	7	56	63	11%	89%	12	66	78	15%	85%
Tenure-Track	8	50	58	14%	86%	21	25	46	46%	54%
Non-tenure track	1	6	7	14%	86%	5	14	19	26%	74%
Total	16	112	128	13%	88%	38	105	143	27%	73%

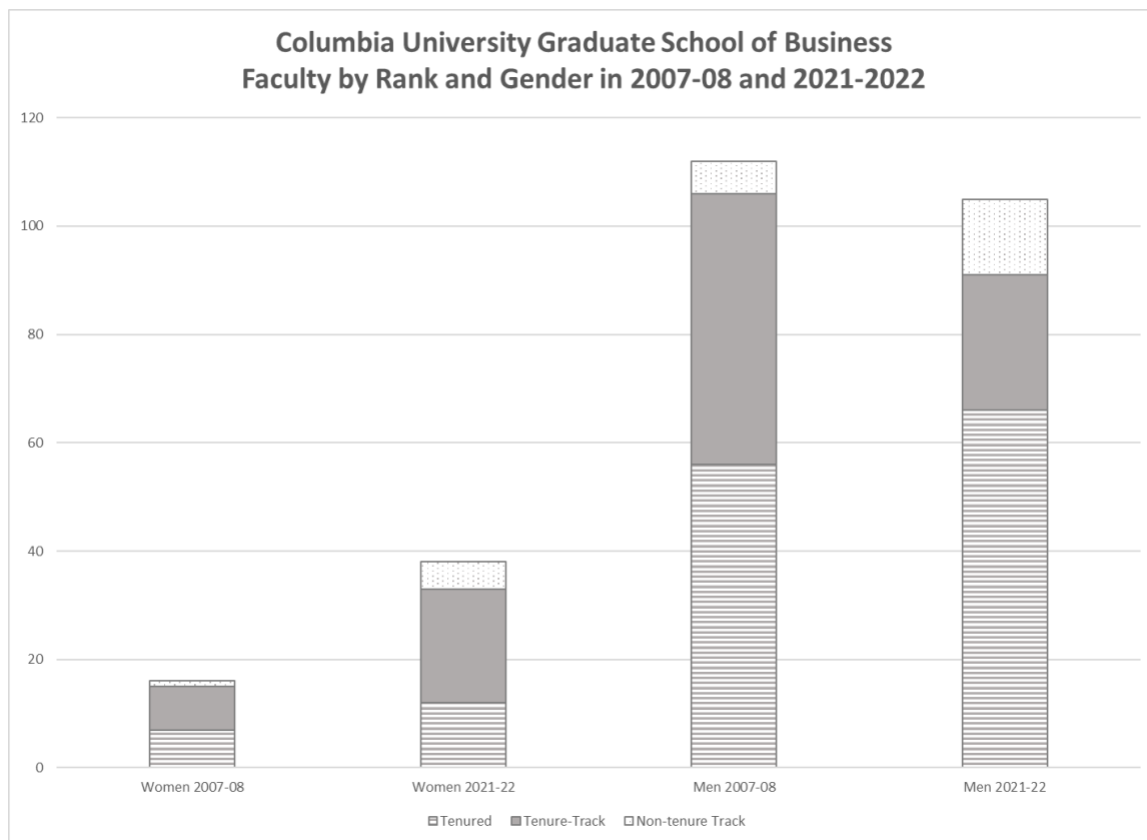
3. In 2021-2022, 87 percent (31/38) of all women faculty and 87 percent (91/105) of all men faculty were tenured or on tenure track, as compared with 94 percent (15/16) of women faculty and 95 percent (106/112) of men faculty in 2007-2008 (see Table 3).

**Table 3: Columbia University Graduate School of Business
Share of Rank by Gender in 2007-08 and 2021-2022**

	Women				Men				Total			
	2007-2008		2021-2022		2007-2008		2021-2022		2007-2008		2021-2022	
	Number	Share	Number	Share	Number	Share	Number	Share	Number	Share	Number	Share
Tenured	7	44%	12	32%	56	50%	66	63%	63	49%	78	55%
Tenure-Track	8	50%	21	55%	50	45%	25	24%	58	45%	46	32%
Non-tenure track	1	6%	5	13%	6	5%	14	13%	7	5%	19	13%
Total	16	100%	38	100%	112	100%	105	100%	128	100%	143	100%

4. The decrease in the share of women faculty who are tenured or on tenure-track stems from the increasing number of non-tenured women faculty; on the other hand, the decrease in the share of men faculty who are tenured or on tenure-track stems from both the increasing number of non-tenured men faculty and the reduced number of men faculty on tenure track (see Figure 1)

Figure 1



5. In 2022-2023, the senior leadership is entirely composed of men. Dean, Senior Vice Dean of Faculty Affairs, Senior Vice Dean for Curriculum and Programs, Vice Dean for Executive Education, Vice

Dean for Research, and Vice Dean for Diversity, Equity and Inclusion are all male. In 2021-2022, two of the six leadership positions (Vice Dean for Research and Vice Dean for Diversity, Equity, and Inclusion) were held by women.

6. In 2022-2023, the six division chairs are male.² There is no recollection of any female division chair in the history of the business school.
7. In 2022-2023, from 14 centers identified, 12 with leadership in place, 20 leadership positions were identified (director and co-director), seventeen male faculty and three female faculty.

Conclusions:

Over the period studied, the number of women faculty increased, and the number of men faculty decreased. Even though the share of women doubled during this period, women accounted for only 27 percent of faculty in 2021-22. This low share is due to the scarce representation of women among tenured faculty, which shows the School's difficulty in promoting or retaining women in senior positions.

In contrast, the School has been successful in increasing the share of women in the pipeline. In 2021-2022, faculty in tenure track positions approached gender parity, with women accounting for 46 percent. This represents a significant achievement compared to the 14 percent share of women tenure track faculty in 2007-2008. The fact that faculty on tenure track is now close to gender parity suggests promising prospects for women to move along the pipeline.

Our findings are consistent with the literature on gender representation in business schools, which indicates that business schools in the United States and internationally have a long way to go to achieve gender equity in their faculty. In 2020, among the top twenty business schools in the United States, Europe, and Asia, only Hong Kong University of Science and Technology Business School had a larger than 30 percent share of female faculty. The University of Chicago's Booth School of Business, with only 18 percent women on its faculty, had the lowest share of female faculty. Columbia Business School was reported to have a 21 percent share of women in 2020 and be on a trajectory of growth (Ethier 2020). As shown in the data above, the share grew to 27 percent in 2021-2022.

² The six divisions are: Accounting; Decision, Risk, and Operations; Economics; Finance; Management; and Marketing.

Recommendations:

The commission has five recommendations:

1. **Leadership:** Leadership should consistently amplify messages (anchored in policy and practice) reinforcing the requirement for equity in our institutions. Leaders and new hires should be valued both for their presenting characteristics and experience, as well as for their potential.
 - a. The School should actively support women in leadership roles. The lack of women in leadership positions is a clear sticking point and has an impact on the culture and climate of the School. Literature on gender representation in business schools indicates that women report lower satisfaction with their compensation, career advancement, and access to leadership positions (Leslie & Johnson-Leslie, 2020).
 - b. Leadership should center conversations around increasing faculty diversity, whenever possible, and identify mechanisms of accountability.
2. **Culture/Climate:** Institutional culture change flows from strong messages and actions from leadership. Leadership must encourage best policies and practices in support of equity, mentoring consistent with these practices, including developing and sustaining a culture that values a diversity of perspectives.
3. **Promotions and Retention:** The School should continue to prioritize and actively support women in tenure track positions to promote diversity and inclusion and to address the imbalance among the tenured faculty. This can be achieved through a range of measures, including:
 - a. Providing women with targeted mentorship and career development programs. This can include pairing them with senior faculty members, providing opportunities for professional development and networking, and offering guidance on navigating the tenure process.
 - b. Providing women with sponsorship from senior faculty members that can help them get recognized for their contributions and can advocate on their behalf.
 - c. Make efforts to retain promoted women faculty.
4. **Hiring:** The School should target tenured women to increase their representation in the faculty and to serve as mentors and sponsors for women junior faculty.
5. **Data:** Ongoing and careful data capture is essential to continually assess (i) the status in terms of equity and (ii) the success of policy refinements and practices in response to equity directives. Annual reports in all University units, including the Business School, should be required to examine to what extent tenure, tenure track, and other faculty lines reflect diversity across

identities to ensure that historically marginalized groups are represented at increasing and equitable rates in tenurable and tenured ranks, and in all leadership positions.

The Commission recommends that all Columbia units integrate these practices into day to day functioning, not only with regard to gender equity, but also with regard to race/ethnicity, sexual orientation, gender identity, disability status, socioeconomic status, religion, national origin, immigration status, limited English proficiency, physical characteristics or health conditions. We must continue to be vigilant in all our efforts to strengthen equity. Implicit bias assures that we cannot assume objective capacity to build equity. Intentional data collection, strong leadership in support of equity, and institutional culture that values diversity in leadership are needed to ensure progress towards equity at Columbia University.

References

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Leslie, H.S. & Johnson-Leslie, N.A. (2020). Gender equity in business schools—perception or reality: A conventional content analysis. *Global Journal of Business Disciplines*, 4(1), 44-65.

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Columbia University Senate
Commission on the Status of Women

The Advancement of Women Faculty through the Academic Ranks
Mailman School of Public Health Pipeline Study

From 2019 to 2020, the Commission on the Status of Women worked with Dean Linda Fried and the Office of the Vice Provost for Faculty Affairs to study the advancement of women faculty in the Mailman School of Public Health over the past ten years. This work follows the previous studies for Arts and Sciences (2001 and 2015), Vagelos College of Physicians and Surgeons (2018), and School of Law (2019). This report summarizes our findings and our recommendations.

Considering the periods 2007-08 and 2018-19, the Commission found that:¹

1. The total number of faculty increased by 2 percent. The number of women faculty increased by 11 percent (from 92 to 102) and the number of men faculty decreased by 8 percent (from 75 to 69) (see Table 1).
 - a. The number of tenured faculty increased by 77 percent over this period (from 31 to 55), with a 145 percent increase in women tenured faculty (from 11 to 27) and a 40 percent increase in men tenured faculty (from 20 to 28).
 - b. The number of tenure track faculty decreased by 5 percent over this period (from 40 to 38), with a 5 percent increase in women tenure track faculty (from 21 to 22) and a 16 percent decrease in men tenure track faculty (from 19 to 16).
 - c. The number of non-tenure track faculty decreased by 19 percent over this period (from 96 to 78), with a 12 percent decrease in women non-tenure track faculty (from 60 to 53) and a 31 percent decrease in men non-tenure track faculty (from 36 to 25).

¹ The data used for the analysis are Snapshot data taken on November 1 of academic years 2007-08 and 2017-18. These data were drawn from PeopleSoft and reviewed by the Office of Academic Appointments. The Commission worked with the Vice Provost for Faculty Affairs and the Office of Faculty Affairs to find the most appropriate unique identifier for use in faculty counts. Possible identifiers included: (i) Administrative Department (department that administers a faculty member's position, where any related paperwork is generated, including a tenure dossier), and (ii) Position Department (department in which a faculty member is tenured and where they undertake their research / teaching). For most faculty, administrative department and position department are the same, but this is not always the case. The main concern in using Administrative Department as identifier is the inclusion of appointments to centers. The main concern in using position department is that a faculty member may have multiple positions. To address these concerns, the Commission chose the Position Department, but it combined it with Primary Appointment. The Appendix presents analogous results with faculty defined by Administrative Department.

**Table 1: Columbia University School of Public Health Faculty
Percentage Change in Faculty by Rank and Gender between 2007-08 and 2018-2019
Faculty defined by Position Department - Primary Appointment**

	2007-08			2018-19			Percentage Change		
	Women	Men	Total	Women	Men	Total	Women	Men	Total
Tenured	11	20	31	27	28	55	145%	40%	77%
Tenure-Track	21	19	40	22	16	38	5%	-16%	-5%
Non-tenure track	60	36	96	53	25	78	-12%	-31%	-19%
Total	92	75	167	102	69	171	11%	-8%	2%

2. Women faculty accounted for 60 percent of total faculty in 2018-19, as compared with 55 percent in 2007-08 (see Table 2). In 2018-19:
 - a. Women accounted for 49 percent of tenured faculty, up from 35 percent in 2007-2008 (to 27 from 11).
 - b. Women accounted for 58 percent of tenure track faculty, up from 53 percent in 2007-08 (to 22 from 21).
 - c. Women accounted for 68 percent of non-tenure track faculty, up from 63 percent in 2007-08 (to 53 from 60).

**Table 2: Columbia University School of Public Health Faculty
Share of Faculty by Gender for different Rank in 2007-08 and 2018-2019
Faculty defined by Position Department - Primary Appointment**

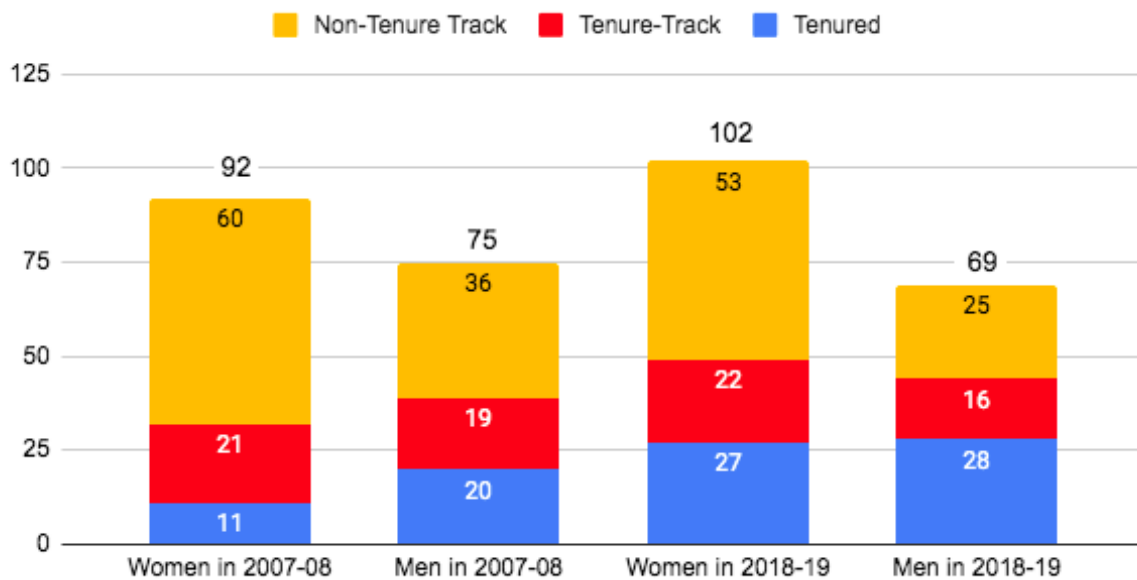
	2007-08					2018-19				
	Women		Men		Total	Women		Men		Total
	Number	Percentage	Number	Percentage	Number	Number	Percentage	Number	Percentage	Number
Tenured	11	35%	20	65%	31	27	49%	28	51%	55
Tenure-Track	21	53%	19	48%	40	22	58%	16	42%	38
Non-tenure track	60	63%	36	38%	96	53	68%	25	32%	78
Total	92	55%	75	45%	167	102	60%	69	40%	171

3. In 2018-19, 48 percent of all women faculty (49/102) and 64 percent of all men faculty (44/69) were tenured or on tenure track, as compared with 35 percent of women faculty (32/92) and 43 percent of men faculty (39/75) in 2007-08. The increased share of all men faculty who are tenured or on tenure-track stems mainly from the decreasing number of non-tenured men faculty.

**Table 3: Columbia University School of Public Health Faculty
Share of Rank by Gender in 2007-08 and 2018-2019
Faculty defined by Position Department - Primary Appointment**

	2007-08						2018-19					
	Women		Men		Total		Women		Men		Total	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Tenured	11	12%	20	27%	31	19%	27	26%	28	41%	55	32%
Tenure-Track	21	23%	19	25%	40	24%	22	22%	16	23%	38	22%
Non-tenure track	60	65%	36	48%	96	57%	53	52%	25	36%	78	46%
Total	92	100%	75	100%	167	100%	102	100%	69	100%	171	100%

Columbia University School of Public Health Faculty Change by Rank and Gender between 2007-08 and 2018-19



Conclusions:

- Over the period studied, the total number of School of Public Health faculty remained relatively constant, with only a 2 percent increase (167 to 171), unlike other schools studied previously², and the School has demonstrated a strong commitment to the representation of female faculty, with women faculty accounting for 60 percent of total faculty in 2017-18, up from 55 percent in 2007-08 (from 92 to 102).
- During this time, the School of Public Health *substantially increased* the total number of tenured faculty, with the result that tenured faculty accounted for 32 percent of total faculty

² Faculty defined by administrative department increased only from 150 in 2007-2008 to 155 in 2018-2019 (See Appendix – Table 1)

in 2018-19, up from 19 percent in 2007-08.³ The share of women among the tenured faculty increased to 49 percent from 35 percent (from 11 to 27), over this period.

3. The number and share of tenure-track faculty decreased very slightly over this period, to 22 percent of all faculty in 2018-19, from 24 percent in 2007-08 (from 40 to 38). The share of women among tenure track faculty increased to 58 percent in 2018-19 from 52 percent in 2007-08. This increase suggests promising improvements for women to move along the pipeline.
4. The number of non-tenure track faculty decreased by 19 percent over the period studied (from 96 to 78), while the share of non-tenure track faculty in the total faculty decreased to 46 percent from 57 percent. In 2018-19, women faculty accounted for 68 percent of non-tenure track faculty, as compared with 62 percent in 2007-08.
5. One important caveat related to the non-tenure versus tenure issue is that *female faculty remain more likely to be on the non-tenure track than men, with 52 percent of all women faculty on the non-tenure track in 2017-18, as compared with 36 percent of all men faculty. Nevertheless, this situation has improved over the period studied, with 65 percent of all women faculty and 48 percent of all men faculty on the non-tenure track in 2007-08. This compared with data from other studies, including the Vagelos College of Physicians and Surgeons, implies a contextual factor that signals women may be less likely to be on the tenure track.*

Recommendations:

When we inquired with Dean Linda Fried regarding study outcomes, she shared three recommendations that she believes have facilitated the advancement of women faculty at the School of Public Health over the past decade: data, leadership, and culture. We wish to see these recommendations instituted across campus.

Data: Ongoing and careful data capture is essential to continually assess (i) the current status in terms of equity and (ii) the success of policy refinements and practices to in response to equity directives. Annual reports at all units should be required to examine to what extent tenure, tenure track and all faculty lines reflect diversity across identities to make sure that historically marginalized groups are represented at increasing and equitable rates in tenurable, tenured and in all leadership positions.

Leadership: We need leadership that consistently amplifies messages (anchored in policy and practice) reinforcing the requirement for equity in our institutions. Leaders and new hires should be valued both for their presenting characteristics and experience, as well as for their potential.

³ Tenured faculty defined by administrative department increased from 29 in 2007-08 to 49 in 2018-19 (See Appendix – Table 1)

The Faculty Leadership Institute at CUIMC is an example of institutional commitment to prepare faculty for positions of leadership. We must create mechanisms of accountability.

Culture: Institutional culture change flows from strong messages and actions from leadership, encouraging best policies and practices in support of equity, mentoring consistent with these practices, including developing and sustaining a culture that values a diversity of perspectives.

In light of the social justice movements across the United States in the past year, the Commission recommends that all Columbia units integrate these practices into day to day functioning, not only with regard to gender equity, but also with regard to race/ethnicity, sexual orientation, gender identity⁴, disability status, socioeconomic status, religion, national origin, immigration status, limited English proficiency, or physical characteristics or health conditions.

In spite of improvements over the past decade, the fact that women may still be less likely than men faculty to be on the tenure track at the School of Public Health, and at the Vagelos College of Physicians and Surgeons (two units that we have reviewed in the past three years), suggests that we must continue to be vigilant in all of our efforts to strengthen equity. Implicit bias assures that we cannot assume objective capacity to build equity. Intentional data collection, strong leadership in support of equity, and institutional culture that values diversity in leadership are needed to ensure progress towards equity at Columbia University.

⁴ In future pipeline studies, we will seek to include faculty who do not identify as cisgender men or women

Commission on the Status of Women Members and Contributors 2019-20 & 2020-21

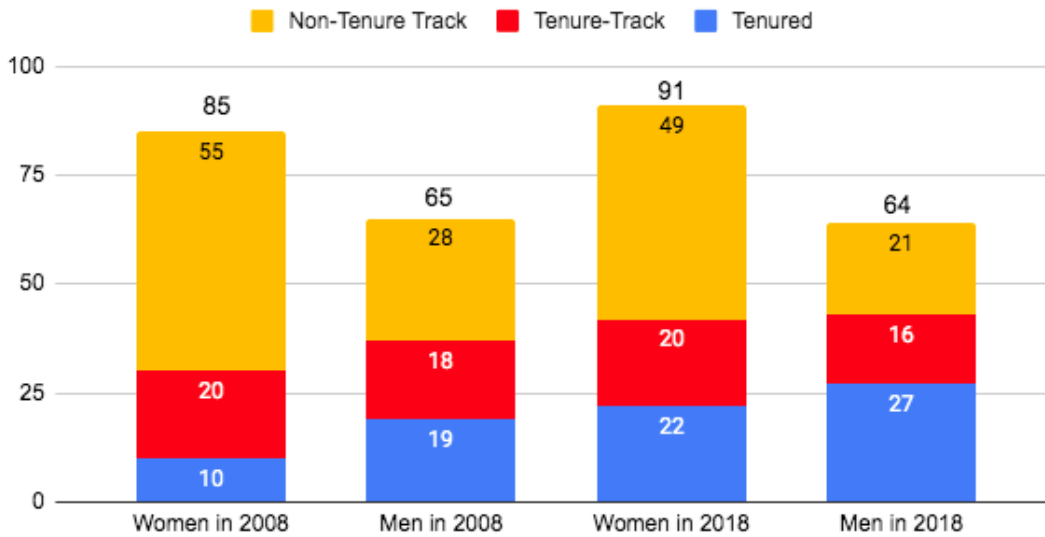
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Appendix

**Table 1: Columbia University School of Public Health Faculty
Percentage Change in Faculty by Rank and Gender between 2007-08 and 2018-2019
Faculty defined by Administrative Department**

	2007-08			2018-19			Percentage Change		
	Women	Men	Total	Women	Men	Total	Women	Men	Total
Tenured	10	19	29	22	27	49	120%	42%	69%
Tenure-Track	20	18	38	20	16	36	0%	-11%	-5%
Non-tenure track	55	28	83	49	21	70	-11%	-25%	-16%
Total	85	65	150	91	64	155	7%	-2%	3%

Mailman Faculty (Admin Dept) 2008 to 2018 by Gender and Rank



**Table 2: Columbia University School of Public Health Faculty
Share of Faculty by Gender for different Rank in 2007-08 and 2018-2019
Faculty defined by Administrative Department**

	2007-08					2018-19				
	Women		Men		Total	Women		Men		Total
	Number	Percentage	Number	Percentage	Number	Number	Percentage	Number	Percentage	Number
Tenured	10	34%	19	66%	29	22	45%	27	55%	49
Tenure-Track	20	53%	18	47%	38	20	56%	16	44%	36
Non-tenure track	55	66%	28	34%	83	49	70%	21	30%	70
Total	85	57%	65	43%	150	91	59%	64	41%	155

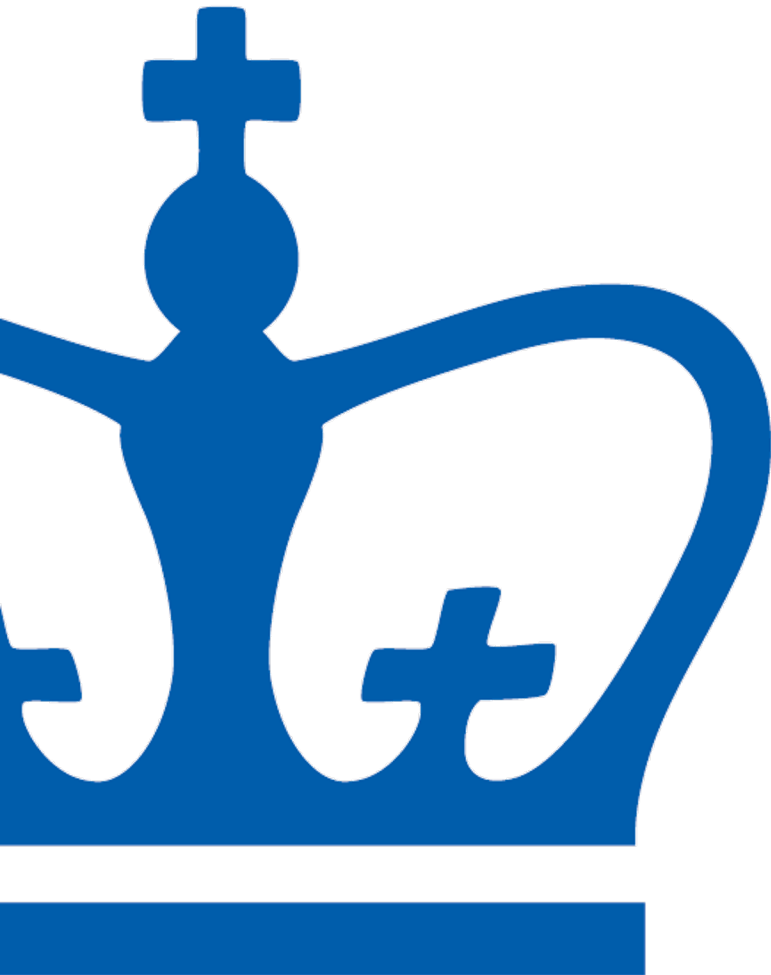
**Table 3: Columbia University School of Public Health Faculty
Share of Rank by Gender in 2007-08 and 2018-2019
Faculty defined by Administrative Department**

	2007-08						2018-19					
	Women		Men		Total		Women		Men		Total	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Tenured	10	12%	19	29%	29	19%	22	24%	27	42%	49	32%
Tenure-Track	20	24%	18	28%	38	25%	20	22%	16	25%	36	23%
Non-tenure track	55	65%	28	43%	83	55%	49	54%	21	33%	70	45%
Total	85	100%	65	100%	150	100%	91	100%	64	100%	155	100%

Commission on the Status of Women

School of Law Pipeline Study:

Advancement of Women Faculty through the Academic Ranks



Presentation to Senate Plenary

May 3, 2019



School of Law Pipeline Study | Background

- In undertaking this study, the Commission sought to answer the following questions:
 - What has been the progress of female faculty through the academic pipeline and how does it compare with the progress of male faculty?
 - Are there leaks in the pipeline and, if yes, where are they?
 - What needs to be done to address leaks and promote equity at all levels?
- Brief history of pipeline studies
 - Arts and Sciences: 2001; 2015
 - Vagelos College of Physicians and Surgeons (P&S) 2018

School of Law Pipeline Study | Background

- 2017 - 2018: Initiation of Study
- 2018 - present: Worked with the Office of the Provost and Dean Gillian Lester
- Data:
 - Drawn from PeopleSoft and reviewed by the Office of Academic Appointments
 - Snapshot data taken on November 1 each year from 2007-08 to 2017-18
 - Structure: Based on primary appointment
 - Analyzed by the Commission on the Status of Women

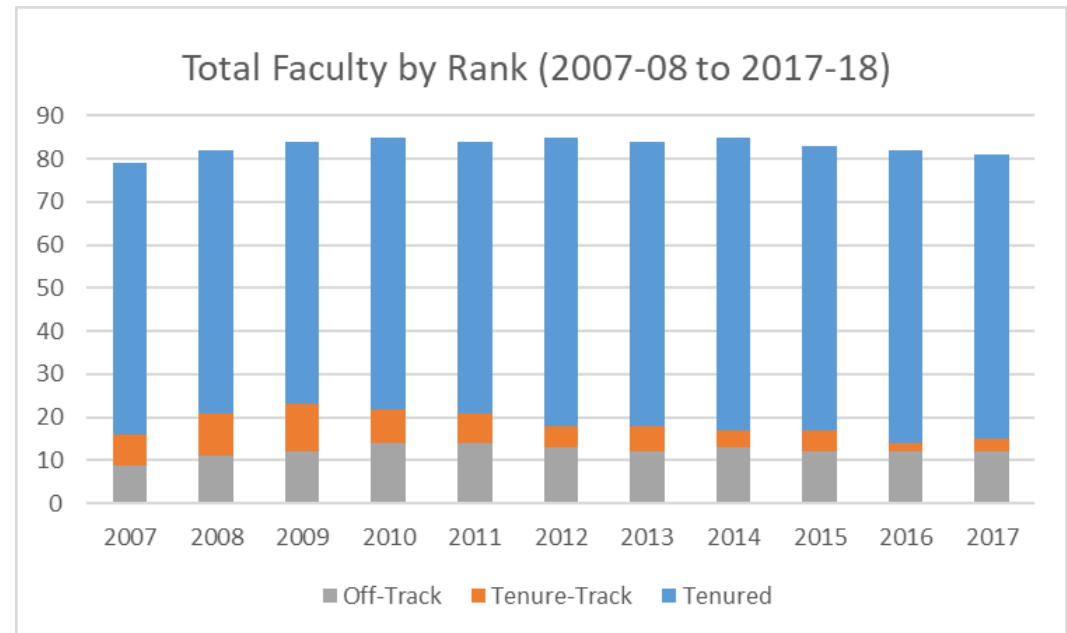
School of Law Pipeline Study | Acknowledgements

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- Gillian Lester Dean, School of Law
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- Pearl Spiro Associate Provost for Academic Appointments
- Carmen DeLeon Assistant Provost for Academic Appointments
- Angel Flesher Assistant Provost for Faculty Affairs
- Anna Makkar Associate Director of Operations and Analytics
- Zeid Sitnica Assistant Provost for Academic Appointments

School of Law Pipeline Study | Total Faculty Population

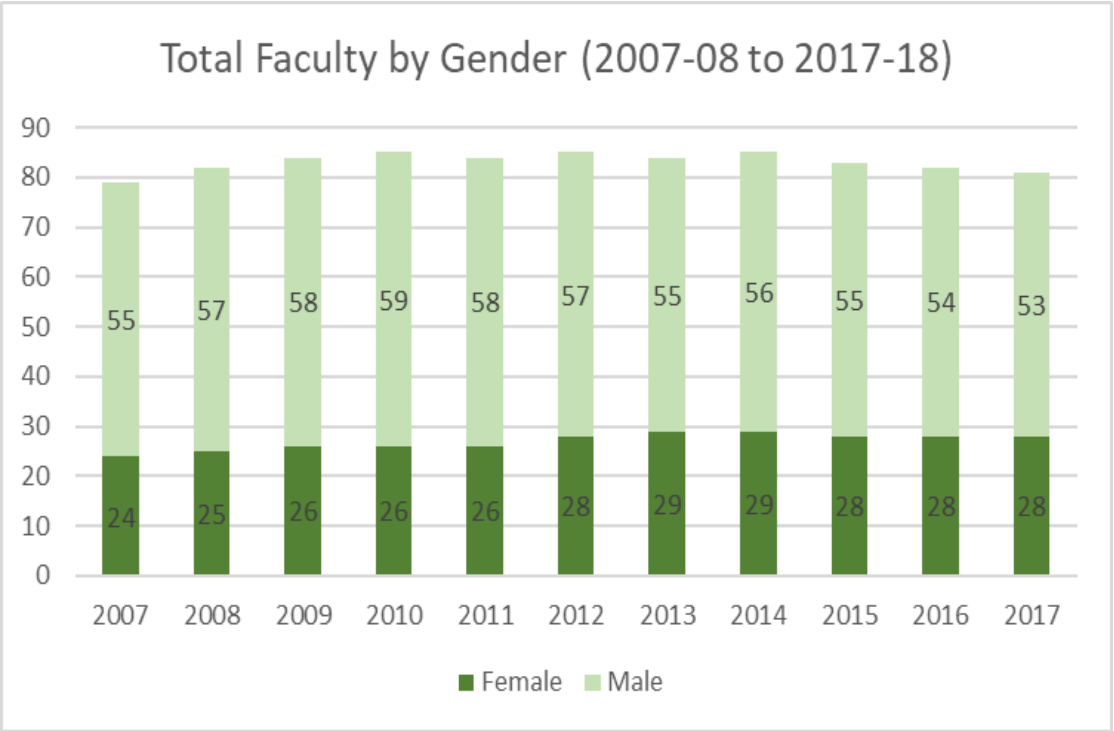
- The structure of the Law School faculty is different from that of the schools studied previously.
- In 2017-18:
 - 81% of faculty were tenured
 - 4% were on tenure track
 - 15% were off-track



School of Law Pipeline Study | Total Faculty Population by Gender

From 2007-08 to 2017-18:

- Number of female faculty increased 17%
- Number of male faculty decreased 4%
- In 2017-18, female faculty accounted for 35% of total faculty, up from 30% in 2007-08

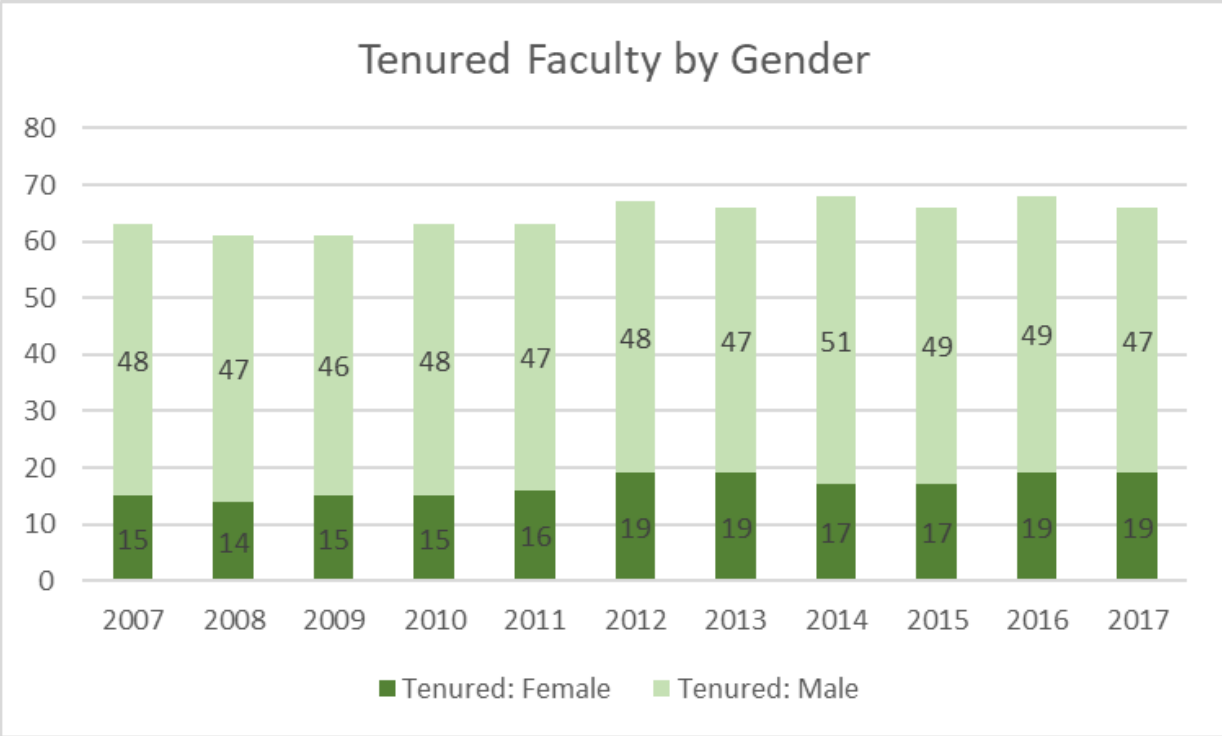


School of Law Pipeline Study | Tenure status: Tenured

- In 2017-18 the ratio of tenured men to tenured women was 2.5 to 1. This ratio was 3.2 to 1 in 2007-08.

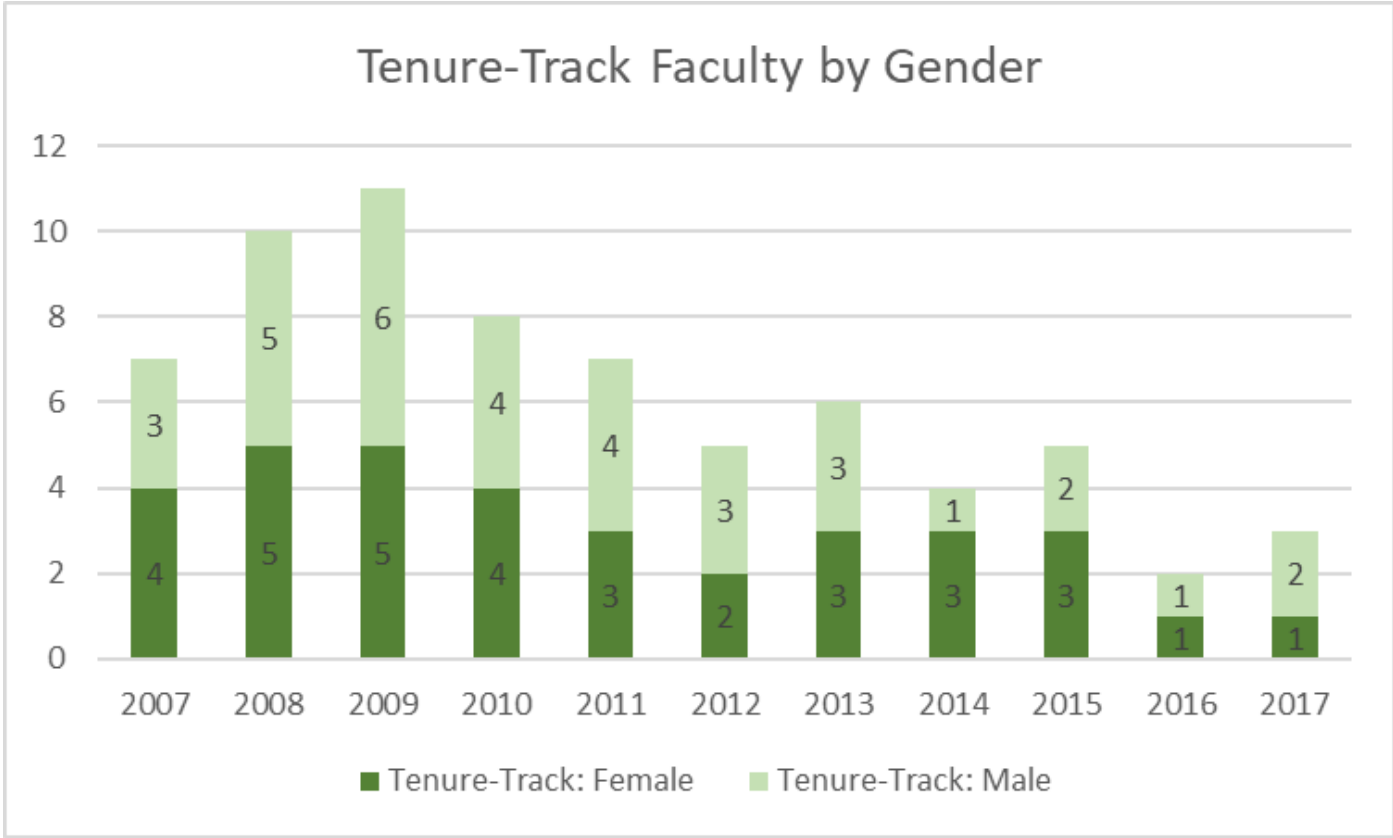
Over the period studied:

- Tenured men decreased by 1
- Tenured women increased by 4



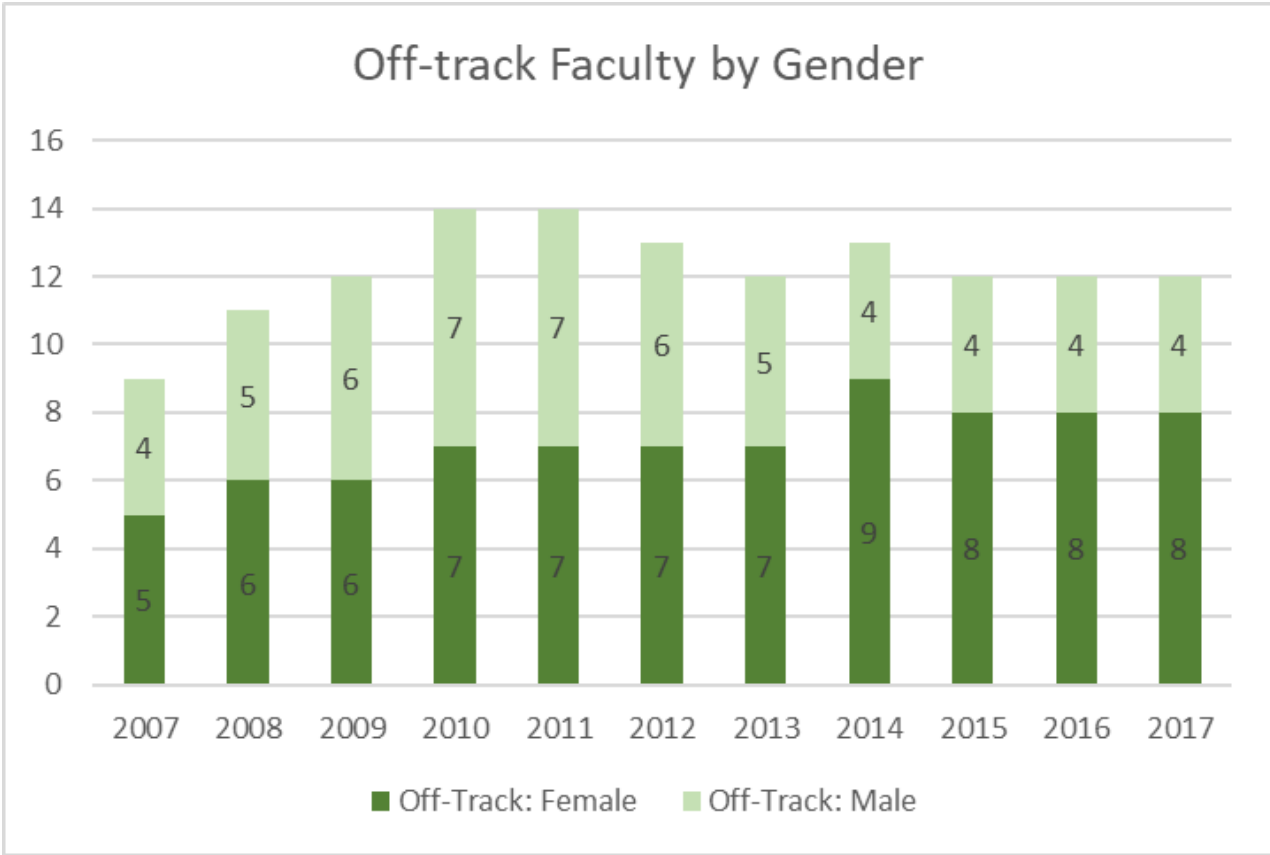
School of Law Pipeline Study | Tenure Status: Tenure-Track

- Over this period, the total number of tenure-track faculty has declined

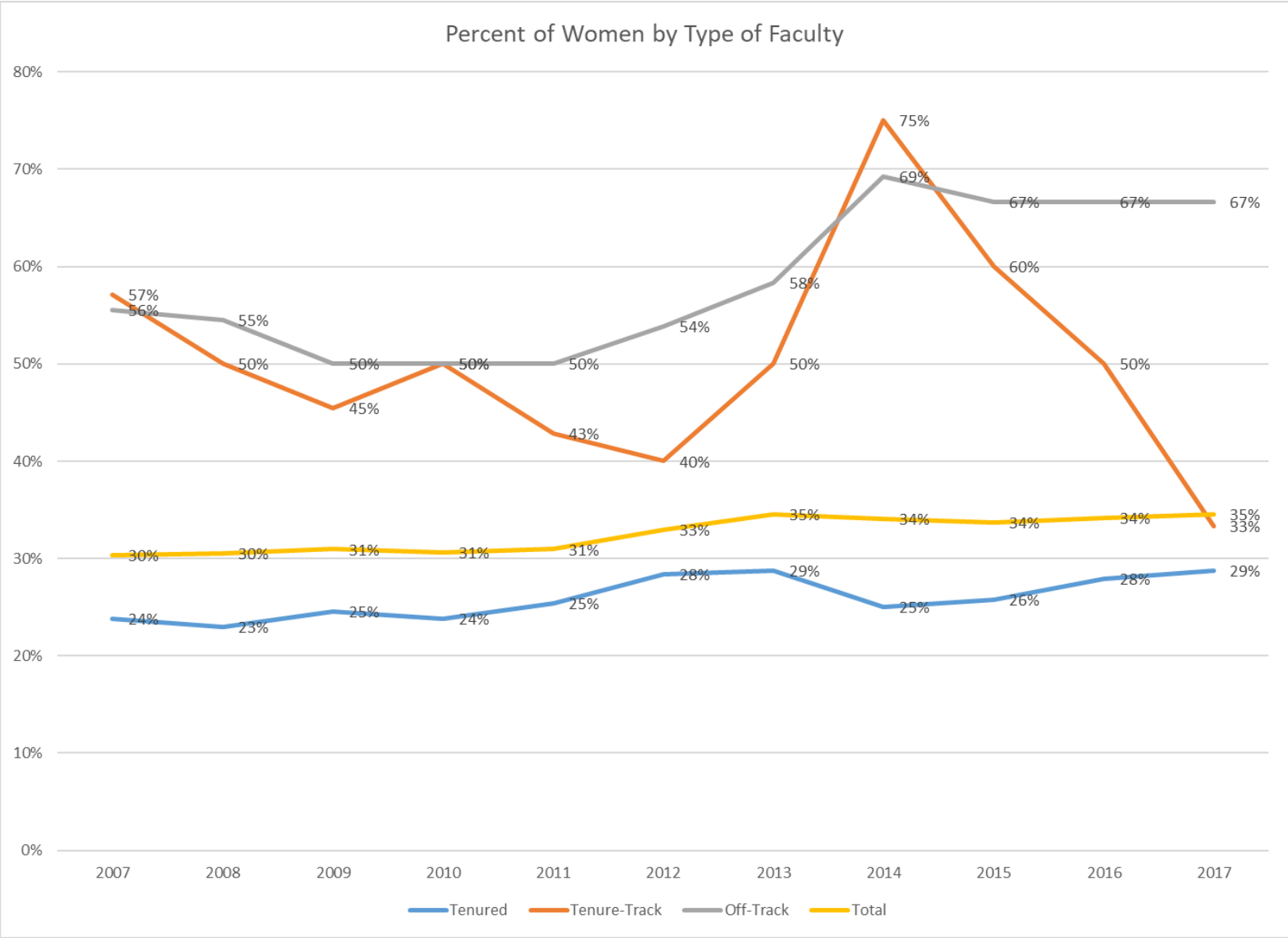


School of Law Pipeline Study | Tenure Status: Off-track

- Over this period, the share of women in off-track faculty increased from 55% to 67%

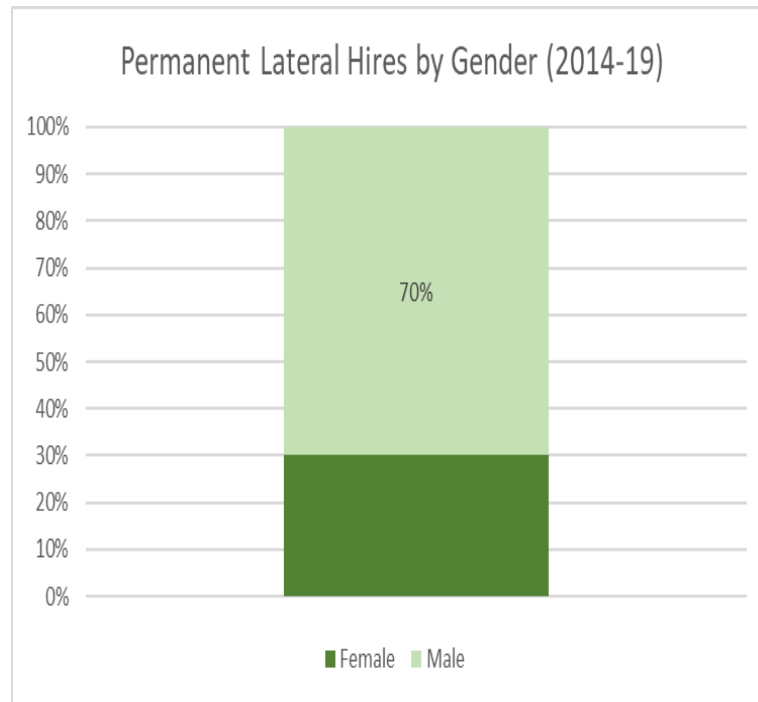
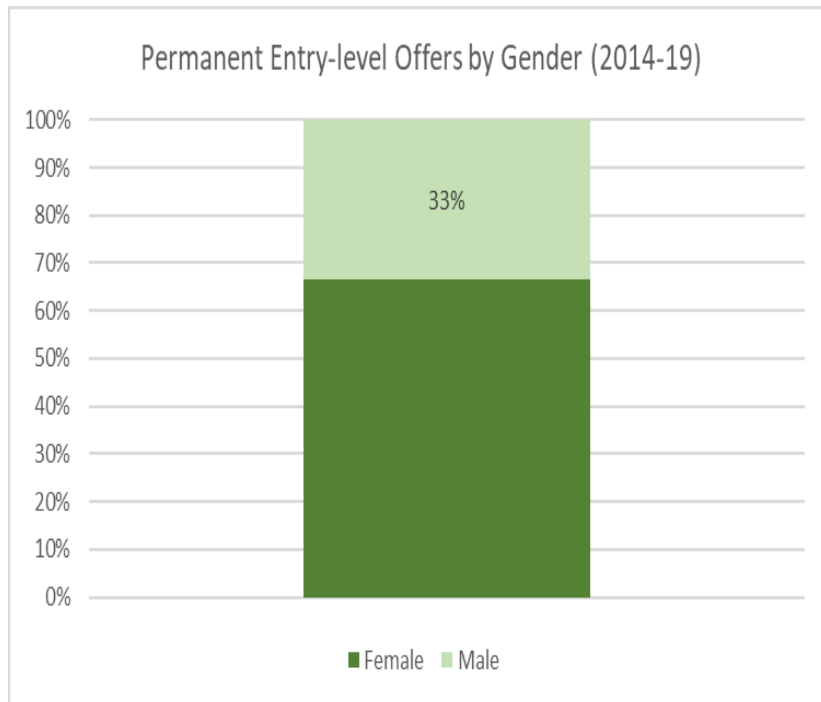


School of Law Pipeline Study: Share of Women Faculty by Tenure Type



School of Law Pipeline Study | The pipeline

- To better understand the pipeline, the Commission considered data on entry-level and lateral hire offers extended. It found that:
 - 67% of all entry-level offers since 2014 were made to women
 - 70% of all lateral offers since 2014 were made to men (but 60% of lateral offers made between 2017 and 2019 were made to women)



School of Law Pipeline Study: Peer Comparison

Law School	Women as a Percentage of Tenured Faculty
NYU	23%
Harvard	25%
Columbia	29%
Stanford	35%
University of Pennsylvania	35%
Yale	37%

Source: websites of each school, last updated April 30, 2019

School of Law Pipeline Study

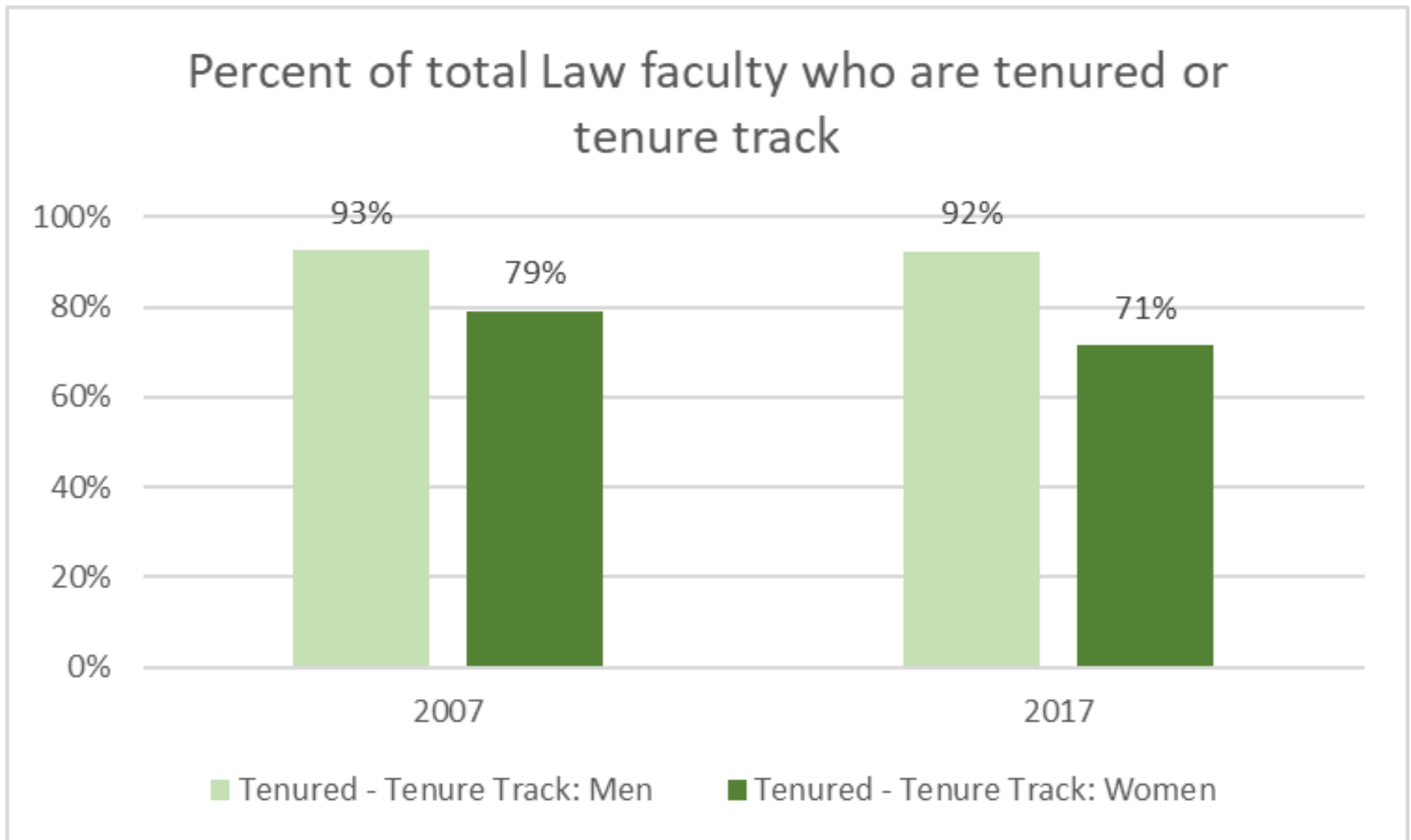
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End of Presentation

School of Law Pipeline Study

Rank: Share by Gender 2007-08 and 2017-18



School of Law Pipeline Study

University Senate Faculty Quality of Life Survey 2015-2016: Executive Summary

- 39 percent response rate, consistent with Morningside
- Overall, 94 percent of the faculty are satisfied being a faculty member
- Areas of highest satisfaction:
 - Salary, rank, benefits, office space, library resources and teaching responsibilities
- Areas of highest dissatisfaction:
 - Classroom and meeting space, support for securing grants, time for scholarly work
- Key areas of stress for faculty:
 - Committee and administrative responsibilities and scholarly productivity
- **Faculty are satisfied with their life outside of work (100%) and feel they can integrate work with family obligations (87%)**
- Nonetheless, 32 percent state that they are likely to leave Columbia within three years

Achieving women's equity in academic medicine: challenging the standards

Despite extensive work for decades to improve gender equity in academic medicine, women continue to lag behind men in the number of tenure and leadership positions. This status quo hampers access of women faculty to the power and decision-making authority necessary to effect change.

By the 1990s, women accounted for 40% of US medical school enrolment. However, these enrolment increases did not address inequities in the recruitment and advancement of women into faculty ranks. As this *Lancet* theme issue attests, these inequities are well documented, and progress has been inadequate. In 2004, Columbia University Irving Medical Center (CUIMC) commissioned a taskforce to identify and study issues that women faculty face in its medical college, the Columbia University Vagelos College of Physicians and Surgeons (P&S), and to make recommendations to

the Dean of the Faculties of Medicine and Health Sciences to improve equity. This taskforce identified a need for transparency and prioritised monitoring progress of women faculty through the ranks. Several taskforce suggestions were implemented, including work-life and parental leave policies, provisions to stop the promotion clock and to improve and increase childcare resources, and on-site lactation rooms. Faculty career tracks were also modified to allow greater flexibility between research, teaching, and clinical care. A range of faculty professional development offerings was implemented, with targeted interventions at crucial career points.

The Columbia University Senate Commission on the Status of Women (a permanent commission of the Columbia University Senate Executive Committee) was charged with inquiring into the status, equity, and opportunities available to women at all levels at Columbia University. The Commission sought the assistance of the Office of the Vice Provost for Faculty Affairs, who provided aggregated data on the counts of faculty with full-time

salaries appointments within P&S. Data on gender and faculty appointment type were drawn from the centralised Human Resources database and reviewed line by line for accuracy. Additionally, the Commission collated data on leadership: department chairs, divisional chiefs, and centre directors (only centres recognised by the university trustees were included in these analyses). Once collated, these data were submitted to the Office of the Provost for review and confirmation of accuracy. The Commission analysed these annual cross-sectional data on faculty positions by gender for the period between 2007 and 2017, to examine the progress (detailed methodology and data analysis is provided in the appendix).

The findings are shown in the figure (full results are provided in the appendix). Women accounted for 46% of total P&S faculty in 2017, an increase from 40% in 2008. However, these strategies did not result in substantial increases in the number of women faculty in tenured or leadership positions, with women accounting for only 18% of tenured positions, a percentage essentially unchanged over the 10-year period. The overall increase in women faculty over this 10-year period was isolated to the hiring of women to non-tenure track positions. In fact, the percentage of men faculty who are tenured or in a tenure-track position remained stable at 28%, whereas, unfortunately, the comparable percentage of women faculty who are tenured or in a tenure-track position decreased from 16% to 12%. In summary, more than four in five women faculty do not have the job security of tenure or the institutional investment and support that comes with the tenure track.

Regarding CUIMC leadership, only three (11%) of 27 P&S departments and only two (13%) of 15 centres are led by women, which is less than the national average of 18%.¹ Leadership equity was present in two



For more on the #LancetWomen initiative see <https://www.thelancet.com/lancet-women>

See Online for appendix

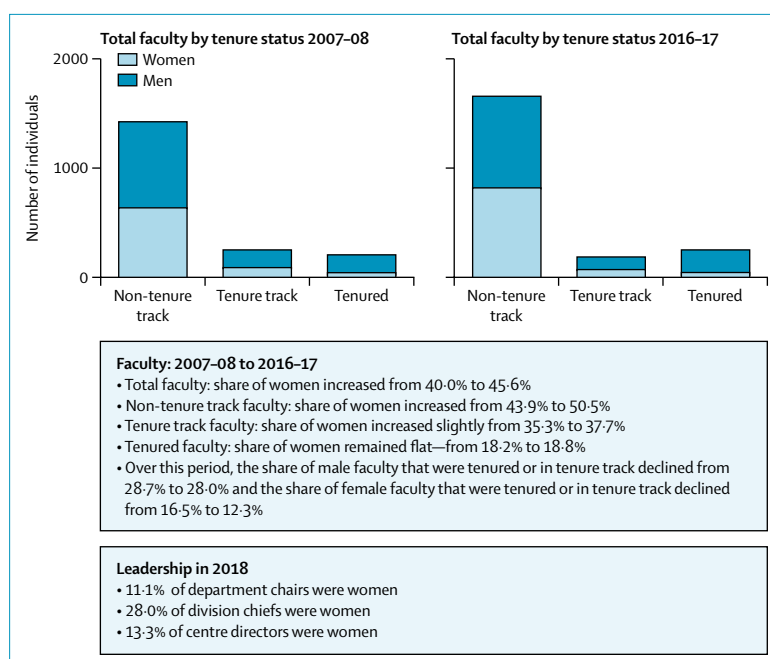


Figure: Total faculty by tenure status

Submissions should be made via our electronic submission system at <http://ees.elsevier.com/thelancet/>

departments: in paediatrics, with women in 47% of division chief roles, and in obstetrics and gynaecology, with women in 50% of division chief roles. By contrast, only 14% of division chiefs in the Department of Medicine, the largest department in CUIMC, are women. The national average for women divisional chiefs is 24% by institution.² Weighed against the starting proportion of 40% female residents, it is clear that women are not achieving equity in leadership. Association of American Medical Colleges peer institution data suggest that the problem of women's under-representation is widespread and not limited to CUIMC.² As a result of their status at CUIMC, the power of women faculty is less than that of their male counterparts, who continue to hold most leadership positions. This absence of women in leadership positions perpetuates inequity and is detrimental to trainees who continue to lack role models. Crucial interventions are required to increase the representation of women in leadership. Present interventions, aimed at individual professional development, are not sufficient to deliver the needed change. Faculty development programmes should actively engage and motivate leaders to ensure gender equity, and these initiatives should be further institutionalised and based on the evidence regarding what has and what has not worked towards this end.

A major factor contributing to these inequities is implicit bias, and managing its effects requires an institutional commitment to the development of specific strategies. It is essential to improve the professional development of women faculty and to implement institutional change that supports the environment for, and the advancement of, all historically underrepresented groups. All institutional leaders and search committees should complete implicit bias training to ensure a more inclusive leadership.

Transparent hiring processes should be adopted, institutionalising best practices in hiring for all leadership searches to proactively attract and hire diverse candidates. Furthermore, leadership term limits should be implemented to increase opportunities for others. Departmental progress should be measurable and transparent, with leadership held accountable in annual departmental and institutional reports. Transparency is fundamental to achieve equity for underrepresented groups. Recommendations to promote transparency include issuing an annual equity report card by department, publishable on their website, and requiring each department to list all committees and members, with terms of appointments. These, along with transparency in the selection process for positions of leadership, are strongly recommended to improve equity.

As evidenced by the broad range of efforts made in the past decade to increase the number of women trainees and faculty members, it is evident that CUIMC is committed to gender equity and diversity in academic medicine. However, regarding leadership, the institution has not yet reached its goal. Research has shown that diverse groups substantially outperform homogenous groups; CUIMC only stands to gain by diversifying its leadership. Furthermore, if the demographic composition of academic medicine does not keep pace with the demographic composition of the US population, we risk a reduced talent pool, which would hinder the long-term growth and progress of academic medicine. Achievement of equity for women and minorities in academic medicine requires a new wave of innovative interventions that challenge the current standard efforts, while also addressing implicit biases on a systemic level. To ensure that women achieve positions of leadership and ultimately shape policy will require institutions to take bold initiatives, with the intention of being the leaders in achieving equity for women.

We declare no competing interests.

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- 1 Association of American Medical Colleges. Department chairs by department, sex, and race/ethnicity. Dec 31, 2017. <https://www.aamc.org/download/486590/data/supplementaltabc.pdf> (accessed Oct 12, 2018).
- 2 Association of American Medical Colleges. 2013 benchmarking—permanent division/section chiefs and department chairs. 2012. https://www.aamc.org/download/411802/data/2014_table9a.pdf (accessed Feb 1, 2018).

THE LANCET

Supplementary appendix

This appendix formed part of the original submission. We post it as supplied by the authors.

Supplement to: D'Armiento J, Witte SS, Dutt K, Wall M, McAllister G, on behalf of the Columbia University Senate Commission on the Status of Women. Achieving women's equity in academic medicine: challenging the standards. *Lancet* 2019; **393**: e15-16.

Letter: Achieving Women's Equity in Academic Medicine: Challenging the Standards

Authors: Jeanine D'Armiento, Susan S. Witte, Kuheli Dutt, Melanie Wall, and Geraldine McAllister on behalf of the Columbia University Senate Commission on the Status of Women

Corresponding author: Jeanine D'Armiento, Columbia University

Keywords: women in medicine, bias, equity, leadership

Appendix

Methods

In fall 2015, the Commission on the Status of Women began identifying and collecting data for this study, approaching the Faculty Affairs team at P&S. The Commission sought the assistance of the Office of the Vice Provost for Faculty, who provided aggregated data on the counts of faculty with full-time salaried appointments within P&S. Data on gender and faculty appointment type were drawn from the centralized Human Resources database, and reviewed line by line for accuracy by the above offices. In addition, the Commission also collated data on leadership: department chairs, divisional chiefs and center director. Once collated, these data were submitted to the Office of the Vice Provost for Faculty Affairs for review and confirmation of accuracy.

Data Analysis

To examine trends, data were assembled from ten academic school years, academic 2007-08 through 2016-17. The data represent repeated cross-sectional counts taken on November 1 each year of full-time salaried faculty whose primary position was in a department within P&S. November 1 is the date by which faculty appointments have been finalized and integrated into the human resources system for the academic year. Longitudinal data within faculty were not available due to the potential for identification based on small sample sizes. Data include faculty appointment type categorized as: Tenured, Tenure-track (but not yet tenured), and Other non-tenure-track. The attribution of Other non-tenure track includes Assistant, Associate, and Full professors with similar duties/expectations as Tenured/Tenure-track faculty, but whose funding source is compiled primarily from so-called soft money (clinical and grant revenue). Counts of each faculty appointment type were stratified by gender (men/women).

Results

As shown in Figure 2, there has been a 28.2 percent increase in the number of women faculty (from 752 to 964) and a 2.0 percent increase in the number of men faculty (from 1,127 to 1,150). By 2016-17, women accounted for 45.6 percent of total P&S faculty, up from 40.0 percent in 2007-08.

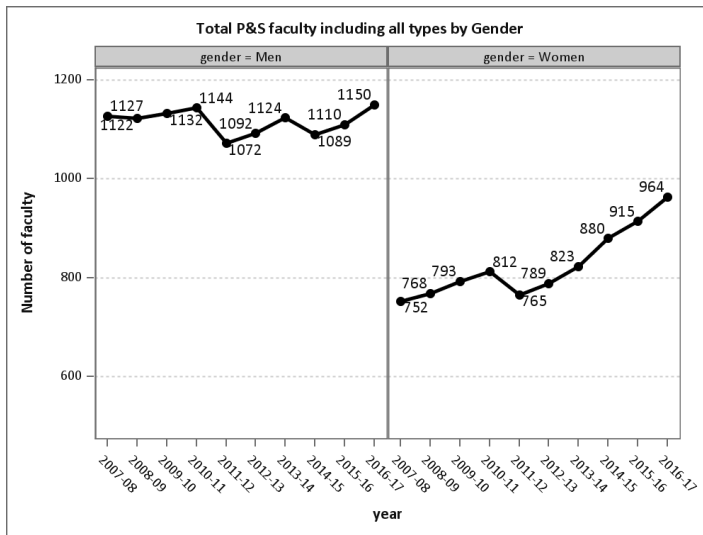
In P&S, non-tenure track appointments are more common than tenure/tenure-track appointments, with 79.1 percent (1,673 out of 2,114) of all faculty being on the non-tenure track in 2016-17 (Figure 3a). Non-tenure track appointments are also more common for women than for men, with 87.7 percent of women compared to 72.0 percent of men holding this appointment in 2016-17. Indeed, the overall increase in women faculty over this ten-year period has been isolated to increases in non-tenure track appointments, which increased 34.6 percent (from 628 to 845). In summary, in P&S, the percentage of men faculty who are tenured or tenure-track has remained relatively stable over this period at 28.0 percent in 2016-17 and 28.7 percent in 2007-08, while the comparable percentage of women faculty who are tenured or tenure-track decreased from 16.5 percent to 12.3 percent (Figure 3). Women faculty account for 50.5 percent (845 out of 1,673) of all non-tenure track faculty in 2016-17, but only 27.0 percent (119 out of 441) of tenured/tenure-track faculty.

When only tenured faculty are considered (Figure 3b), a larger than 4 to 1 ratio of men to women was seen in 2007-08 (162 tenured men to 36 tenured women) and that ratio has not changed over the ten years (203 tenured men to 47 tenured women in 2016-17). Over the ten years examined, there has been an absolute increase of 41 new tenured men faculty but only an increase of 11 women faculty. In summary, 18.2 percent of tenured faculty in 2007-08 were women and nearly identically 18.8 percent were women in 2016-17. Over the period studied, the total number of tenure-track faculty, men and women, declined, yet in 2016-17 there remained 1.6 times (119 tenure-track men to 72 tenure-track women) the number of men compared to women on tenure track.

At P&S, there is a hierarchical structure with several levels of administration and management. In large departments, with as many as 650 faculty across 14 divisions, most faculty will interact with their division chief and will seldom, if ever, interact with the department chair. In terms of leadership in 2017, only three of the 27 departments within P&S (11.1 percent) were led by women (Table 1). Women faculty accounted for 28.0 percent of divisional leadership across the 77 divisions, and only two of the 15 centers were led or jointly-led by women.

TABLE 1: LEADERSHIP BY GENDER, 2018					
Unit	Total	Women		Men	
	N	N	%	N	%
Department ¹	27	3	11.1	24	88.9
Division ²	75	21	28.0	54	72.0
Center ³	15	2	13.3	13	86.7

Figure 2. Count of total P&S faculty including all appointment types by gender



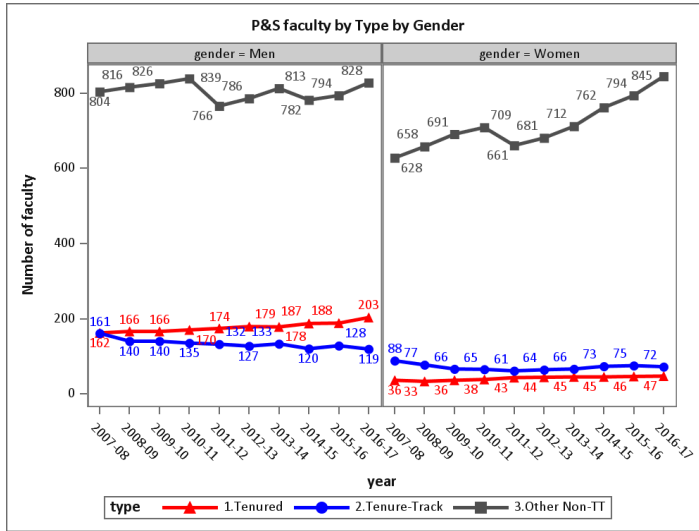
¹ The new departments of Emergency Medicine and Medical Humanities and Ethics have been included.

² At the time of writing, divisional chief appointments in the departments of Emergency Medicine and Medical Humanities and Ethics have not been made and the divisional chief appointments in General Anesthesia and Neuroanesthesia are open; in total 75 of the total 77 positions are occupied.

³ Trustee-approved centers only are included. One center has co-directors (Naomi Berrie Diabetes Center), and at the time of writing, the position of chief of the Institute for Cancer Genetics was open.

Figure 3. Count of P&S faculty by appointment type and gender

a.



b.

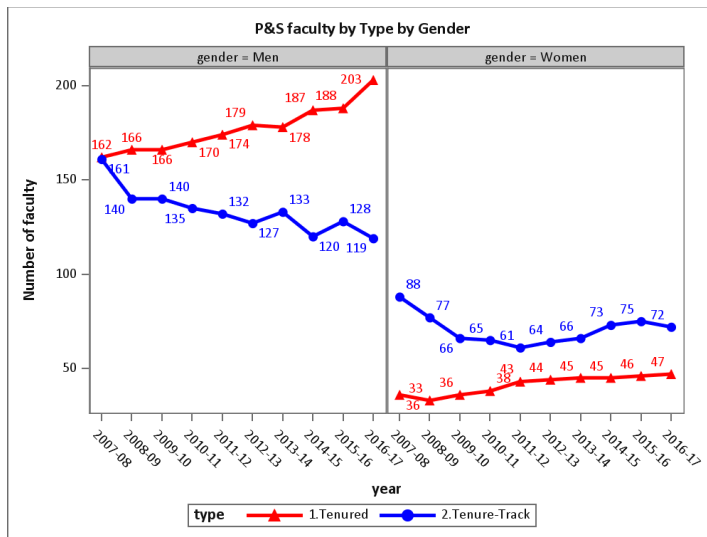
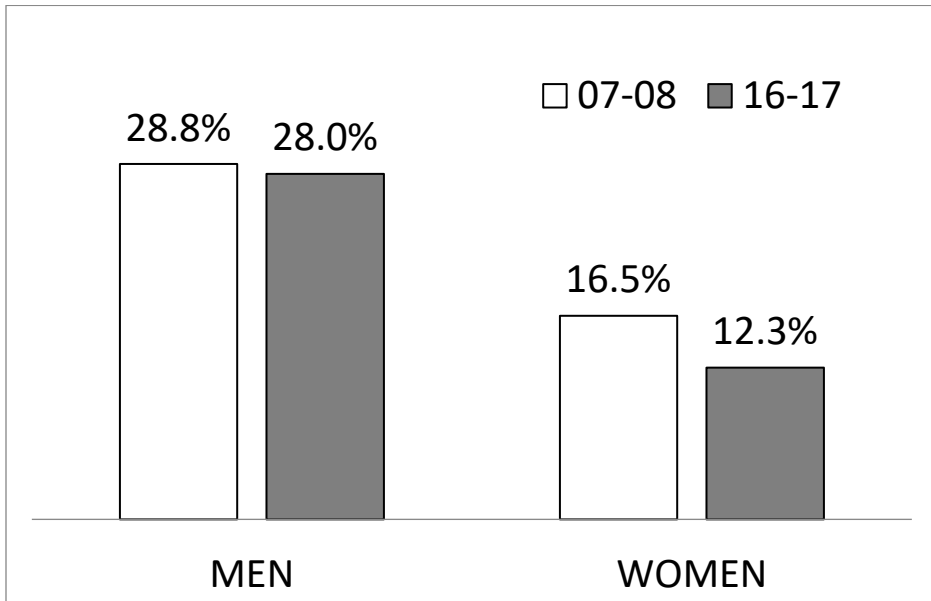


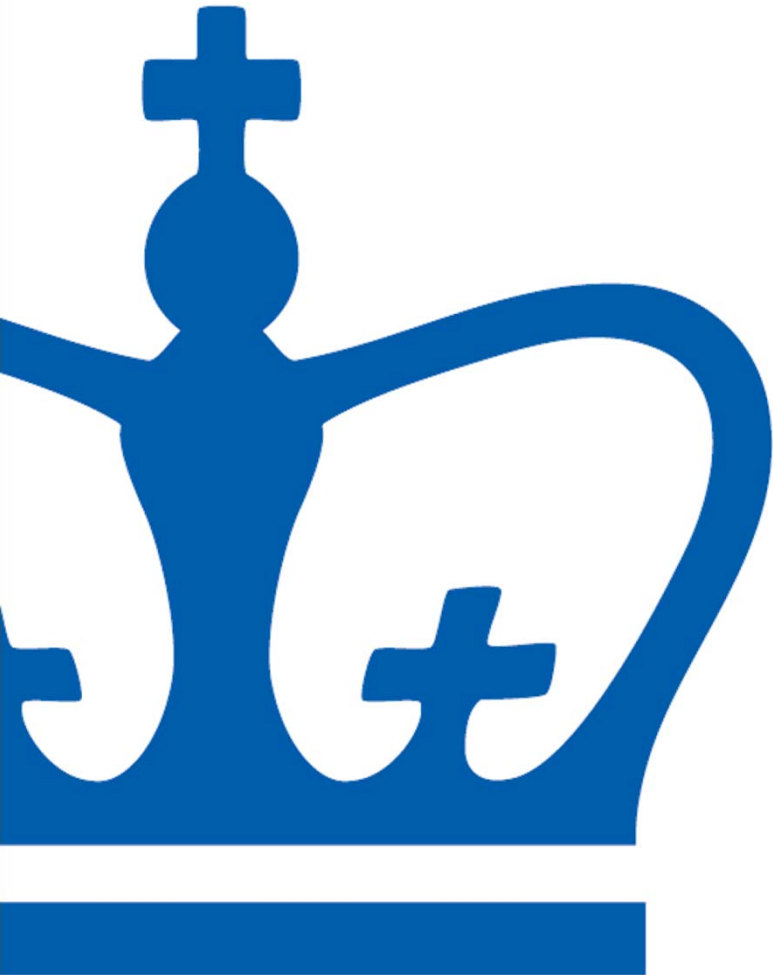
Figure 4: Percent of all P&S faculty who are tenured or tenure-track by gender in 2007-08 and 2016-17



Commission on the Status of Women

Vagelos College of Physicians and Surgeons Pipeline Study:

Advancement of Women Faculty through the Academic Ranks



Presentation to Senate Plenary,
February 2, 2018



Vagelos College of Physicians and Surgeons Pipeline Study Background

- The Commission seeks to answer the following questions:
 - What has been the progress of female faculty through the academic pipeline and how does it compare with the progress of male faculty?
 - Are there leaks in the pipeline and, if yes, where are they?
 - What needs to be done to address leaks and promote equity at all levels?
- Brief history of pipeline studies
 - Arts and Sciences: 2001; 2015
 - College of Physicians and Surgeons (P&S) initiated in 2015

Vagelos College of Physicians and Surgeons Pipeline Study Background

- 2015-2016: Initiation of Study
- 2016-present: Worked with the Academic Affairs division in the Office of the Provost (Faculty Affairs and Academic Appointments)
- Data:
 - Drawn from PeopleSoft and reviewed by Academic Affairs
 - Snapshot data taken on November 1 each year from 2007-08 to 2016-17
 - Structure:
 - **Data 1: Position department + primary appointment**
 - Data 2: Administrative department
 - Analyzed by Dr. Melanie Wall, Director of Biostatistics, Psychiatry, CUMC

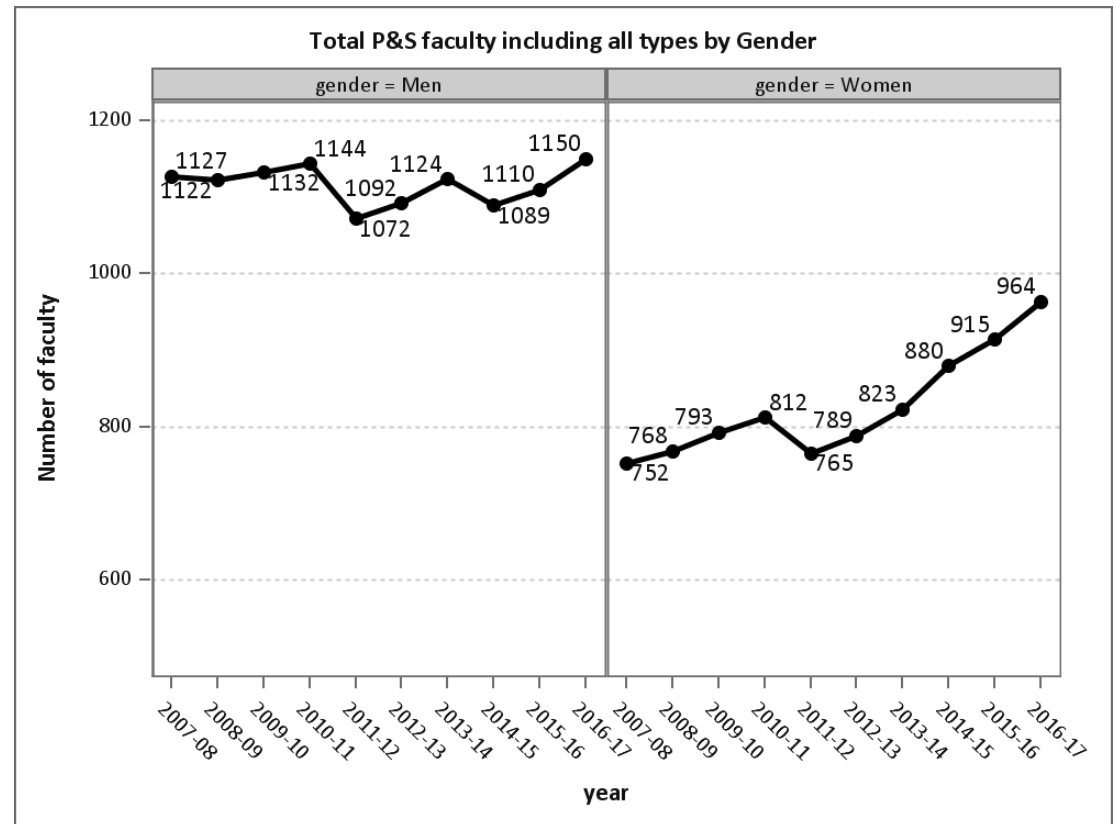
Vagelos College of Physicians and Surgeons Pipeline Study Acknowledgements

We wish to thank the Office of the Vice Provost for Faculty Affairs and the Office of Academic Appointments for their essential assistance with this study:

- Christopher Brown Vice Provost for Faculty Affairs
- Carmen DeLeon Assistant Provost for Academic Appointments
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- Art Palmer Interim Vice Provost for Faculty Affairs
- Zeid Sitnica Assistant Provost for Academic Appointments
- Pearl Spiro Associate Provost for Academic Appointments

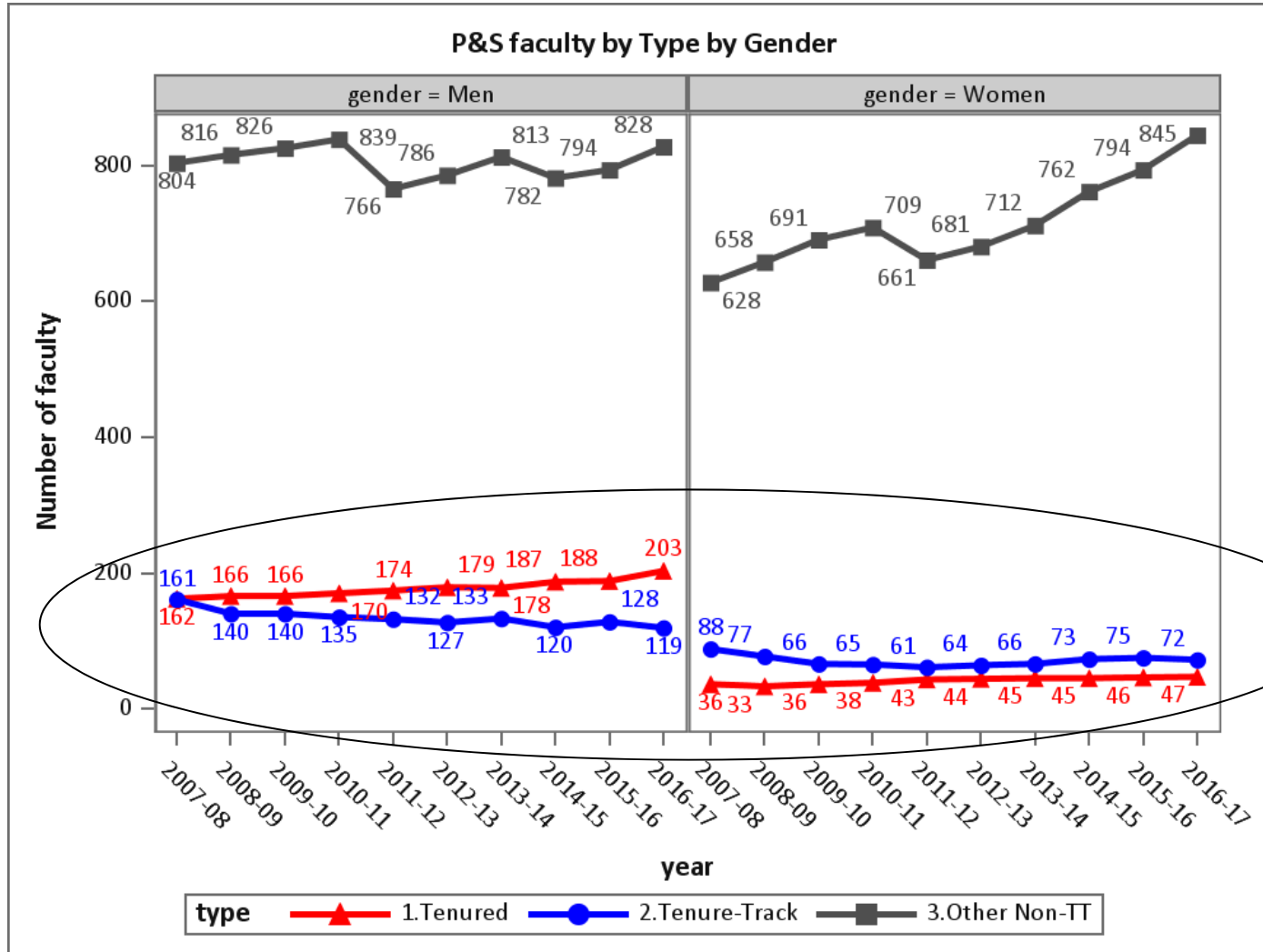
Vagelos College of Physicians and Surgeons Pipeline Study Total Faculty Population

- Over the period 2007-08 to 2016-17, there has been a 30% increase in the number of women faculty and a 1% increase in the number of men faculty
- By 2016-17, women faculty accounted for 46% of total faculty, up from 40% in 2007-08



Vagelos College of Physicians and Surgeons Pipeline Study

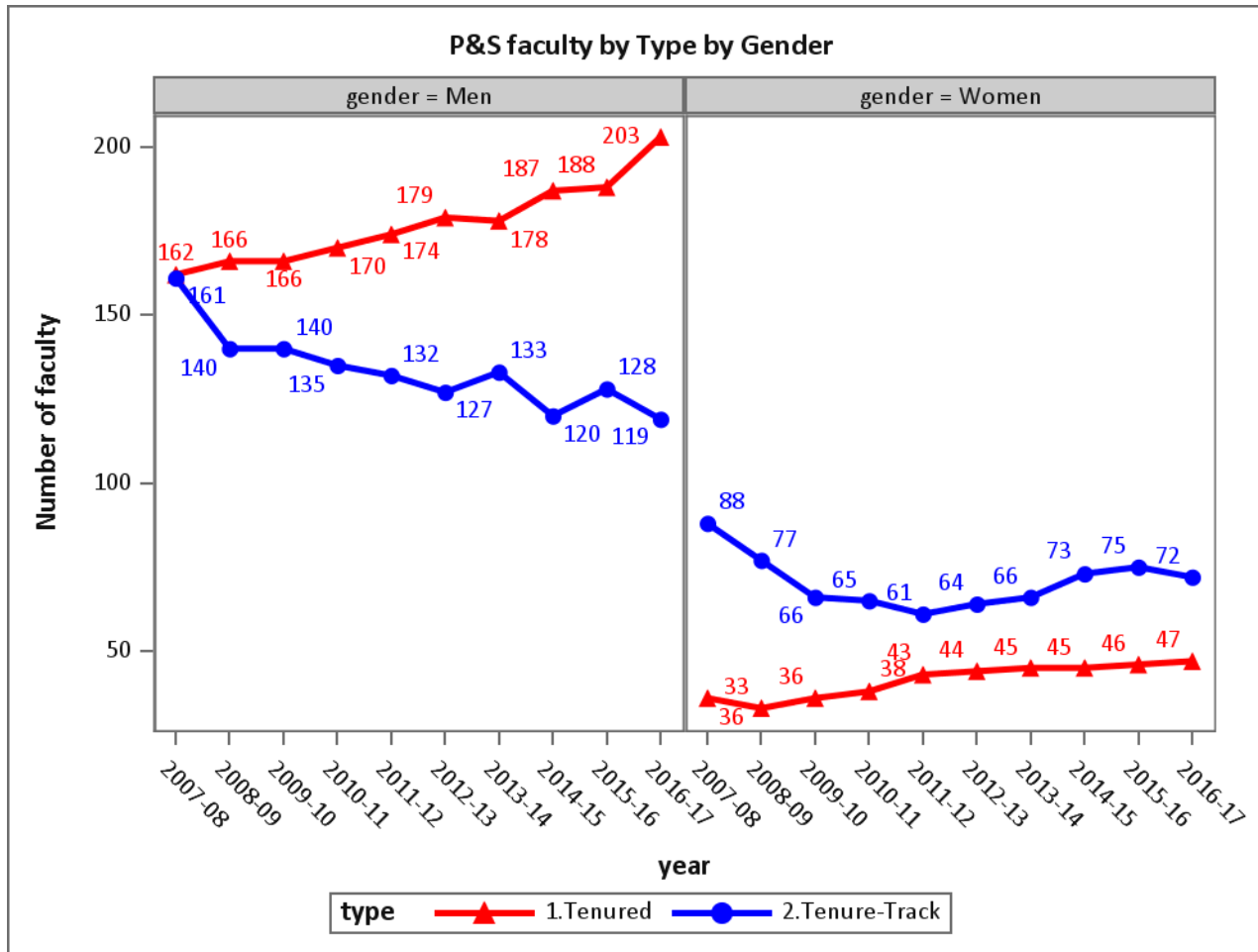
Tenure Status: All



- The greatest increases have been seen on the nontenure track where there has been a:
 - 4% increase in men faculty
 - 37% increase in women faculty
- Women faculty now account for 51% of all nontenure track faculty

Vagelos College of Physicians and Surgeons Pipeline Study

Tenure status: Tenured



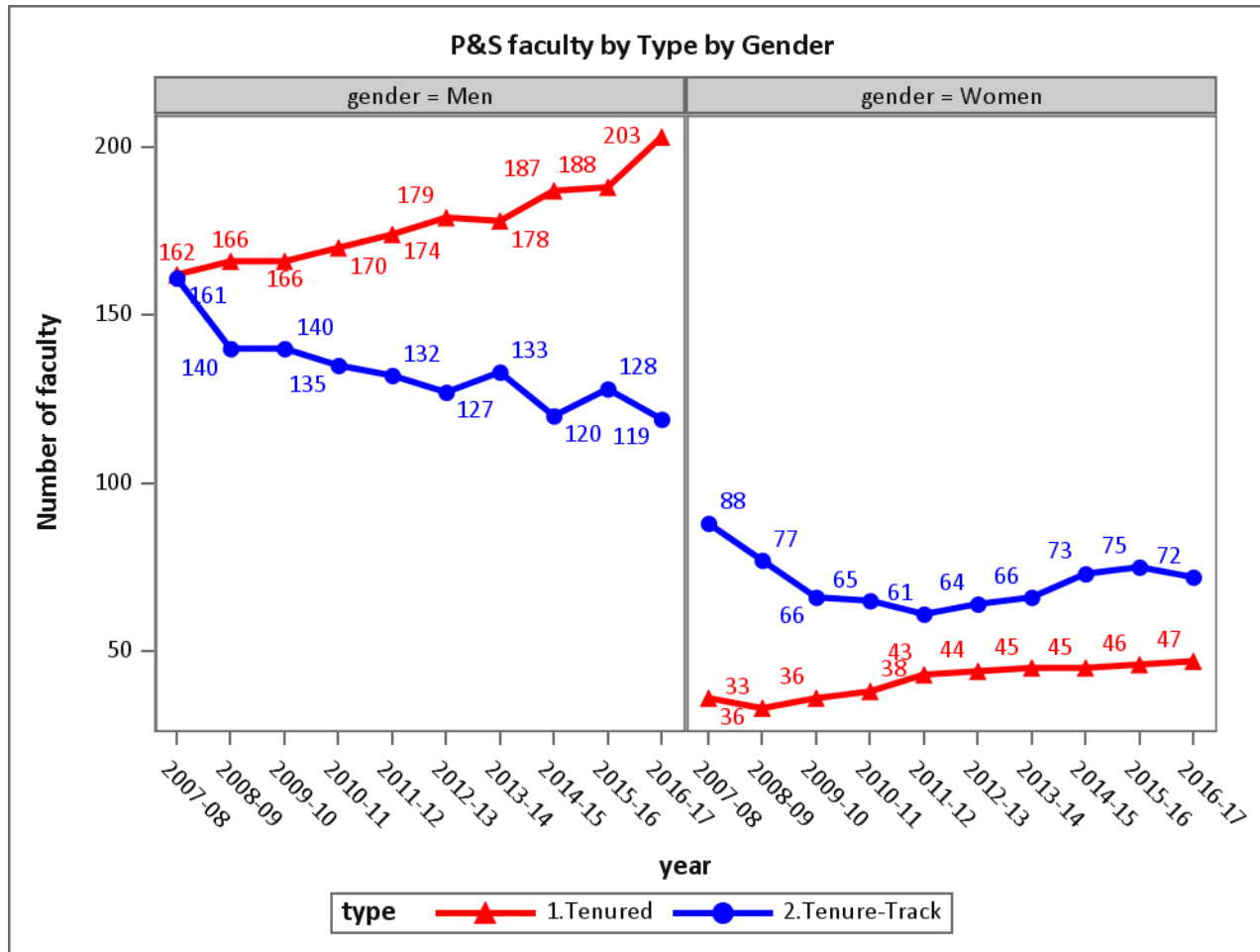
- **4 to 1 ratio of Men to Women who are tenured**

In ten years:

- Tenured men increased by 41
- Tenured women increased by 11

Vagelos College of Physicians and Surgeons Pipeline Study

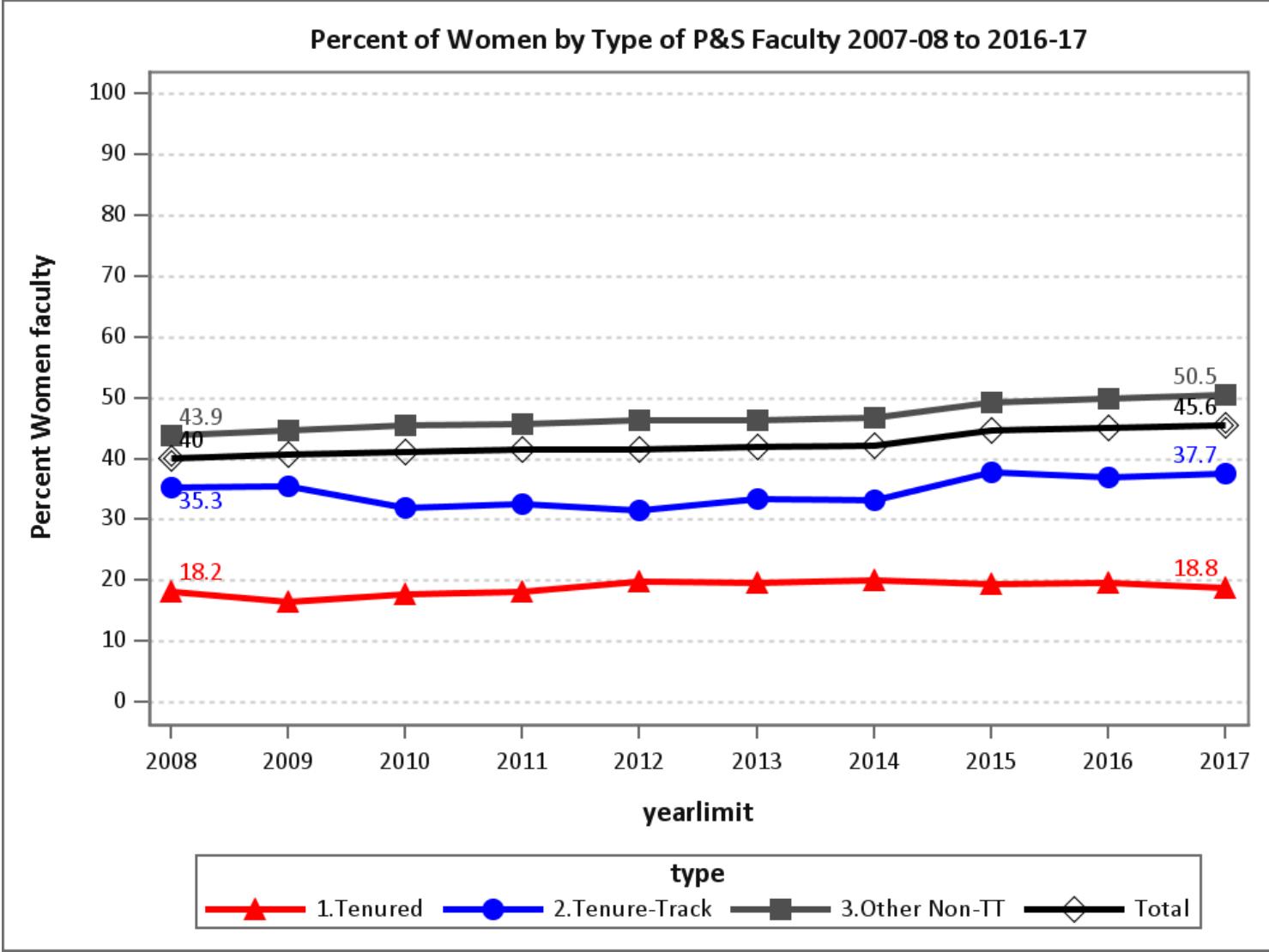
Tenure Status: Tenure-Track



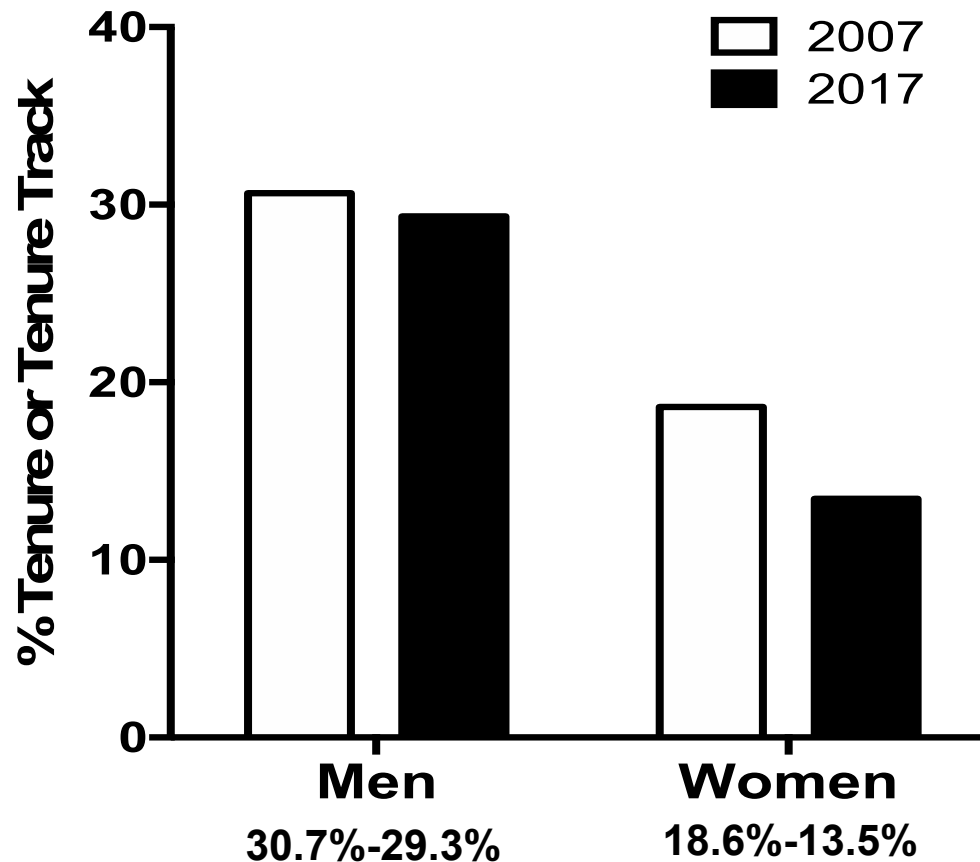
- Over this period, the number of tenure track faculty has declined in both men and women
- Still 1.6 men for every 1 woman on the tenure track in 2016-17

Vagelos College of Physicians and Surgeons Pipeline Study

Share of Women Faculty by Tenure Type

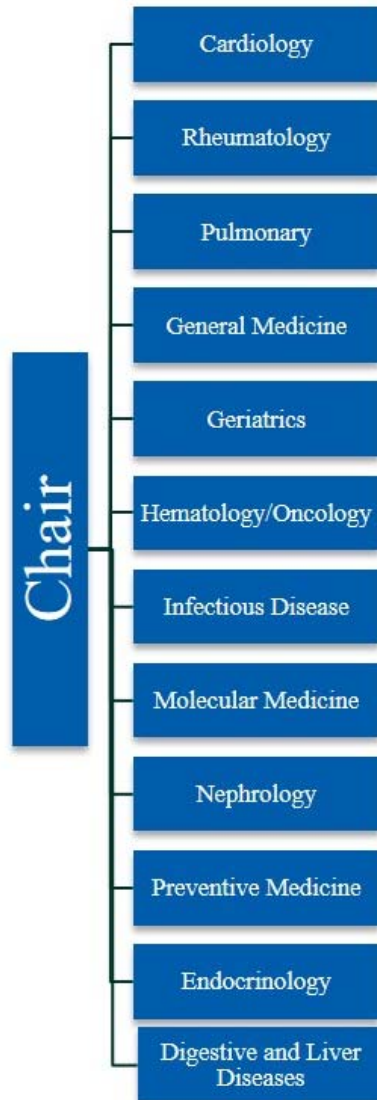


Percent of total P&S faculty who are tenured or tenure track

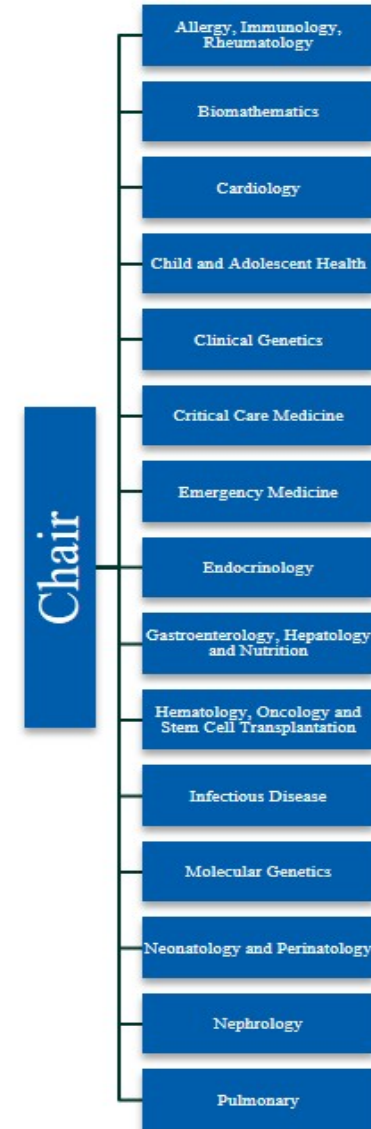


Vagelos College of Physicians and Surgeons Pipeline Study Leadership Complexity

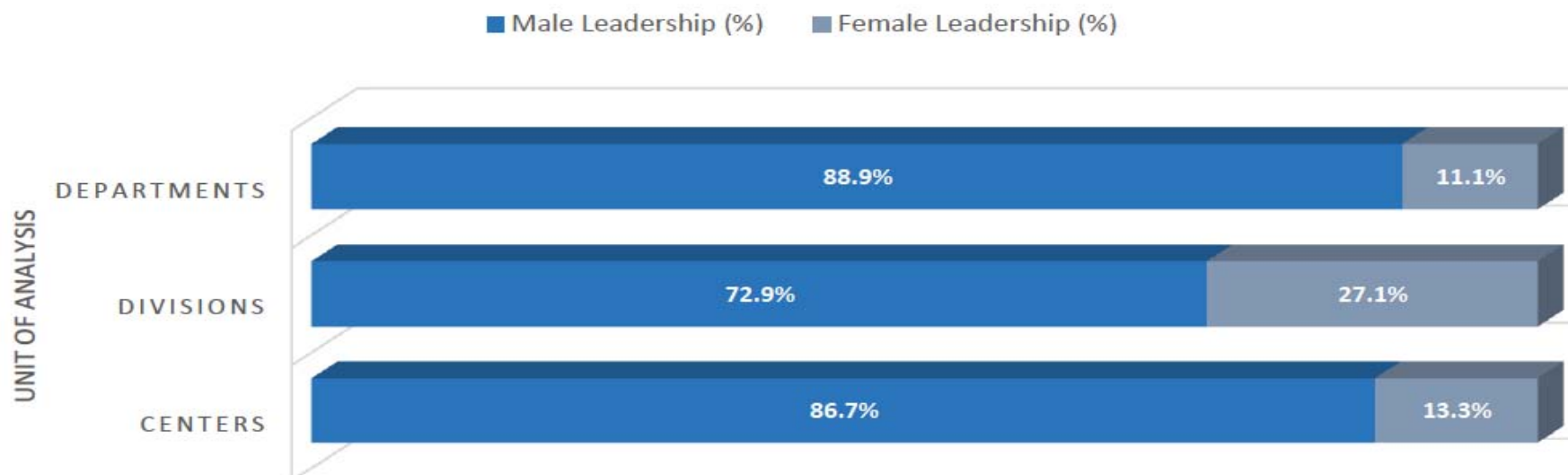
Medicine-650 Faculty



Pediatrics-280 Faculty



Vagelos College of Physicians and Surgeons Pipeline Study Leadership and Gender



Unit	Total Number	Male Leadership	Female Leadership	Male Leadership (%)	Female Leadership (%)
Department ¹	27	24	3	88.9%	11.1%
Division ²	85	62	23	72.9%	27.1%
Center ³	15	13	2	86.7%	13.3%

¹ Departments of Emergency Medicine and Medical Humanities and Ethics are included

² Divisions of Emergency Medicine and Medical Humanities and Ethics are not included, information not available at time of preparation

³ Trustee approved Centers

Vagelos College of Physicians and Surgeons Pipeline Study

Leadership and Gender by division

Unit	Total Number	Men	Women	Women % of total
Divisional chiefs*	84	61	23	27.4%
Anesthesiology	9	6	3	33.3%
Medicine**	13	11	2	15.4%
Neurology	12	9	3	25.0%
Obstetrics and Gynecology	6	3	3	50.0%
Pediatrics	15	8	7	46.7%
Radiology	11	9	2	18.2%
Surgery***	18	15	3	16.7%

*Divisional Chiefs: Data does not include Psychiatry.

**Medicine: 13 divisions with chiefs included (14 divisions in total)

*** Surgery: 18 divisions with chiefs included (35 divisions in total)

Vagelos College of Physicians and Surgeons Pipeline Study Peer Comparison

School	Women as a Count or Percentage of Women and Men Tenured Faculty
Yale	33%
Brown	27%
Johns Hopkins	22%
Michigan	22%
NYU	20%
Harvard	15%

Source: AAMC. State of Women in Academic Medicine: The Pipeline and Pathways to Leadership, 2015-2016
<https://www.aamc.org/members/gwims/statistics/>

To better understand the experience of women faculty, findings from the University Senate Faculty Quality of Life Survey 2015-16 are included in the appendix.

Vagelos College of Physicians and Surgeons Pipeline Study Recommendations

1. Annual reporting to review and assess the progress of women faculty
2. Attain equal representation of women in the tenured ranks
3. Suggested pathways for success:
 - Equal representation of women in leadership positions within 10 years
 - Targeted hires of senior women
 - Implementation of best practices in hiring to chief positions
 - National searches for all leadership positions

Questions?

Thank you

Appendices

Vagelos College of Physicians and Surgeons Pipeline Study

Faculty Population: Defined by position department and primary appointment

Table 1A: **Columbia University P&S faculty**. Summary counts of faculty by Type, Rank, and Gender 2016-17 (N=2114) vs. 10 years earlier 2007-08 (N=1879)

Faculty defined by Position Department - Primary Appointment

	2016-17				2007-08			
	Total	Men	Women	%Women	Total	Men	Women	%Women
Tenured	250	203	47	18.8%	198	162	36	18.2%
Professor	199	165	34	17.1%	170	140	30	17.6%
Associate Professor	51	38	13	25.5%	28	22	6	21.4%
Tenure-Track	191	119	72	37.7%	249	161	88	35.3%
Professor	8	6	2	25.0%	8	7	1	12.5%
Associate Professor	16	13	3	18.8%	17	11	6	35.3%
Assistant Professor	166	99	67	40.4%	218	140	78	35.8%
Instructor	1	1	0	0.0%	6	3	3	50.0%
Other Non-tenure track	1673	828	845	50.5%	1432	804	628	43.9%
Professor Clinical/of Clinical/Hosp/CUMC	244	169	75	30.7%	207	154	53	25.6%
Associate Professor Clinical/of Clinical/Hosp/CUMC	298	166	132	44.3%	286	189	97	33.9%
Assistant Professor Clinical/of Clinical/CUMC	997	438	559	56.1%	760	381	379	49.9%
Instructor in Clinical/CUMC	134	55	79	59.0%	179	80	99	55.3%
Total	2114	1150	964	45.6%	1879	1127	752	40.0%

Summary data does not include Tenure of Title or Associate in Clinical

Vagelos College of Physicians and Surgeons Pipeline Study

Faculty Population: Defined by Administrative Department

Table 1B: **Columbia University P&S faculty.** Summary counts of faculty by Type, Rank, and Gender 2016-17 (N=2161) vs. 10 years earlier 2007-08 (N=1891)
Faculty defined by Administrative Department

	2016-17				2007-08			
	Total	Men	Women	%Women	Total	Men	Women	%Women
Tenured	259	206	53	20.5%	201	164	37	18.4%
Professor	210	170	40	19.0%	176	144	32	18.2%
Associate Professor	49	36	13	26.5%	25	20	5	20.0%
Tenure-Track	192	120	72	37.5%	248	160	88	35.5%
Professor	10	8	2	20.0%	10	7	3	30.0%
Associate Professor	17	14	3	17.6%	19	13	6	31.6%
Assistant Professor	164	97	67	40.9%	213	137	76	35.7%
Instructor	1	1	0	0.0%	6	3	3	50.0%
Other Non-tenure track	1710	834	876	51.2%	1442	806	636	44.1%
Professor Clinical/of Clinical/Hosp/CUMC	248	169	79	31.9%	212	157	55	25.9%
Associate Professor Clinical/of Clinical/Hosp/CUMC	304	166	138	45.4%	296	191	105	35.5%
Assistant Professor Clinical/of Clinical/CUMC	1020	447	573	56.2%	757	379	378	49.9%
Instructor in Clinical/CUMC	138	52	86	62.3%	177	79	98	55.4%
Total	2161	1160	1001	46.3%	1891	1130	761	40.2%

Summary data does not include Tenure of Title or Associate in Clinical

University Senate Faculty Quality of Life Survey 2015-2016

Vagelos College of Physicians and Surgeons
Faculty Satisfaction by Gender: Brief Report

February 2, 2018



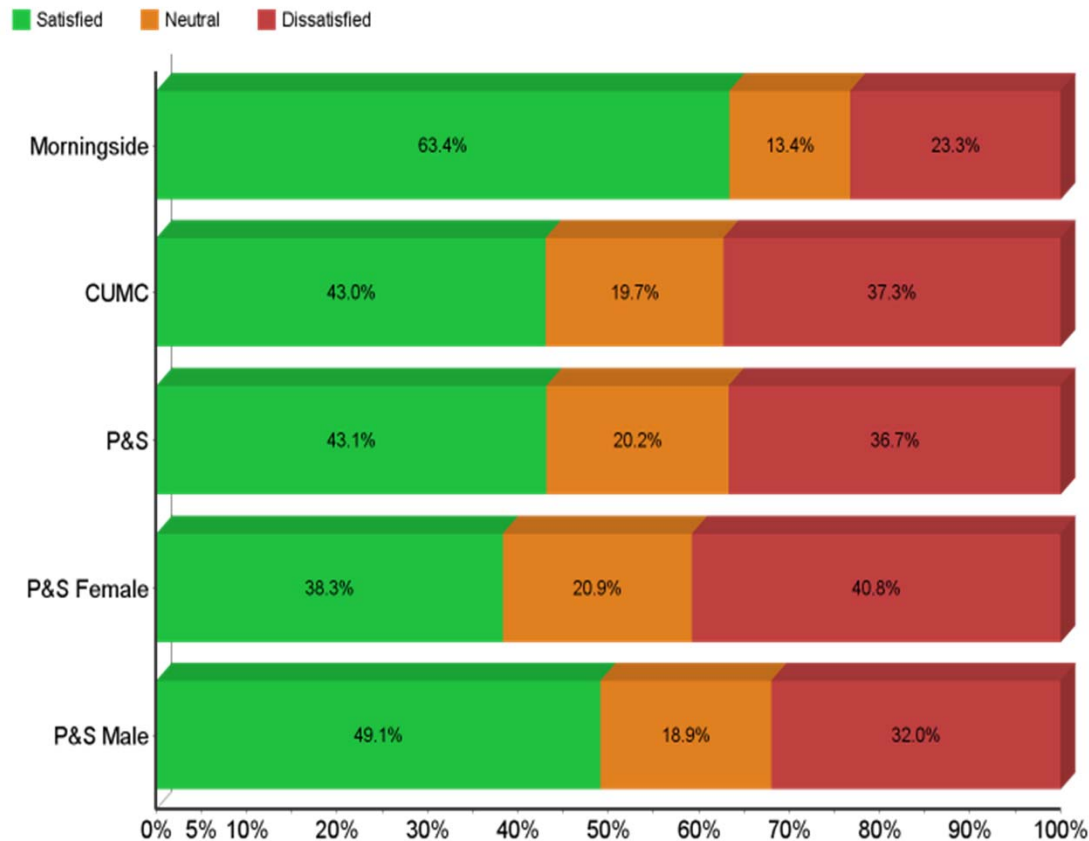
Vagelos College of Physicians and Surgeons Pipeline Study

University Senate Faculty Quality of Life Survey 2015-2016: Executive Summary:

- 41 percent response rate, consistent with Morningside and CUMC
- Overall, 71 percent of the faculty are satisfied being a faculty member
- Areas of highest satisfaction:
 - Quality of students, Library resources, Current rank, Benefits package
- Areas of highest dissatisfaction:
 - Administrative staff to assist with patients, research funds, support for securing grants, clinical staff to assist with patients
- Key areas of stress for faculty:
 - Clinical responsibilities, securing funding for research, department / campus politics
- **Faculty are satisfied with their life outside of work (90%) and feel they can integrate work with family obligations (64%)**
- Nonetheless, 32 percent state that they are likely to leave Columbia within three years
- **Selected items to highlight areas where policy and practice may be improved to respond to existing disparity in faculty experience, specifically to improve support for female faculty**

Satisfaction with Resources for Research & Scholarship

Overall, how satisfied are you with the resources Columbia University provides to support your research and scholarship?

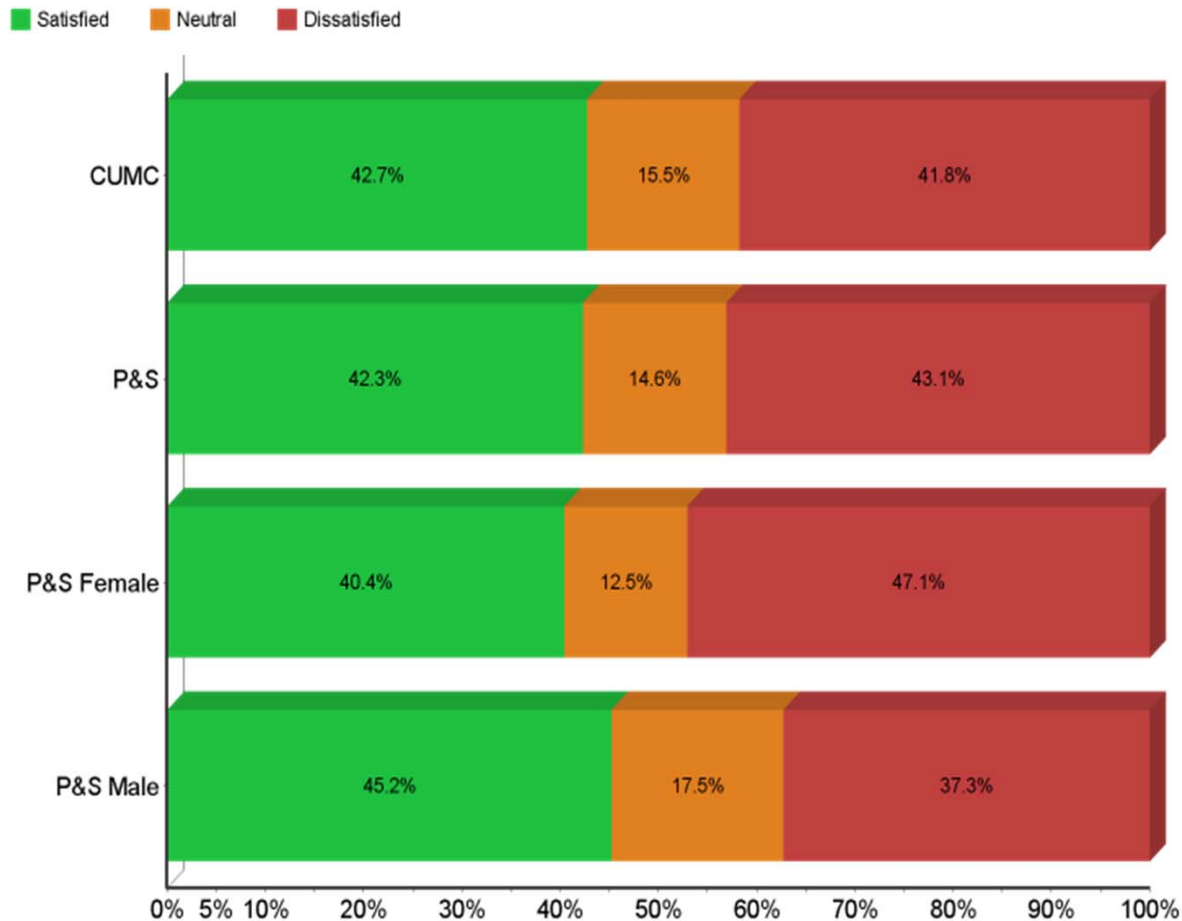


Morningside n=546; CUMC n=954; P&S n=692; P&S Female n=368; P&S Male n=397

- On Morningside, 63 percent of faculty are satisfied with resources and 23 percent are dissatisfied
- At CUMC and P&S, 43 percent of the faculty are satisfied and 37 percent dissatisfied
- **Within P&S, more female faculty are dissatisfied with resources to support their research and scholarship than are satisfied**

Satisfaction with Resources to Support Clinical Duties

Overall, how satisfied are you with the resources Columbia University provides to support your clinical duties?

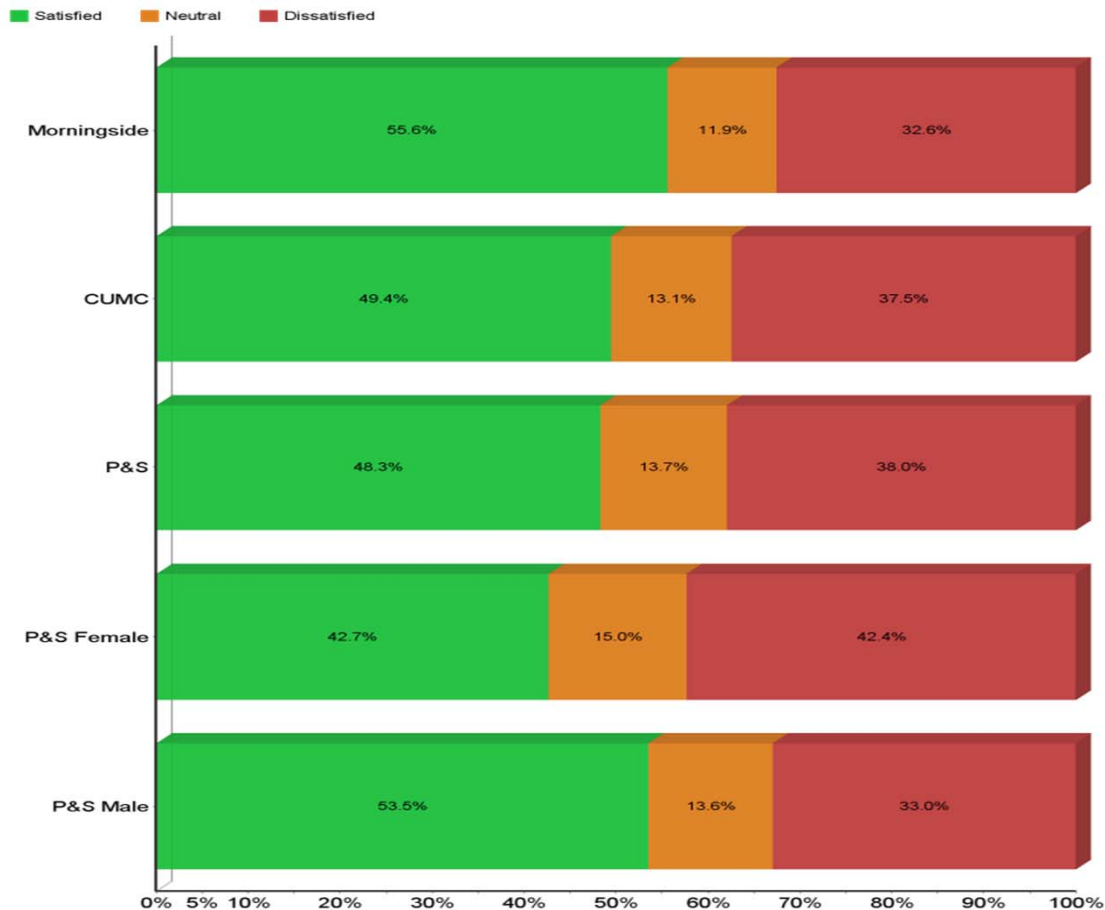


CUMC n=665; P&S n=594; P&S Female n=280; P&S Male n=292

- At CUMC, almost as many faculty are dissatisfied as are satisfied with resources to support clinical duties.
- More P&S faculty are dissatisfied than satisfied with resources to support clinical duties
- **Within P&S, female faculty are more dissatisfied than satisfied, compared to male faculty with resources to support their clinical duties**

P&S Faculty Satisfaction in key areas: (1) Salary

More specifically, please indicate the degree to which you are satisfied with each of the following: Salary

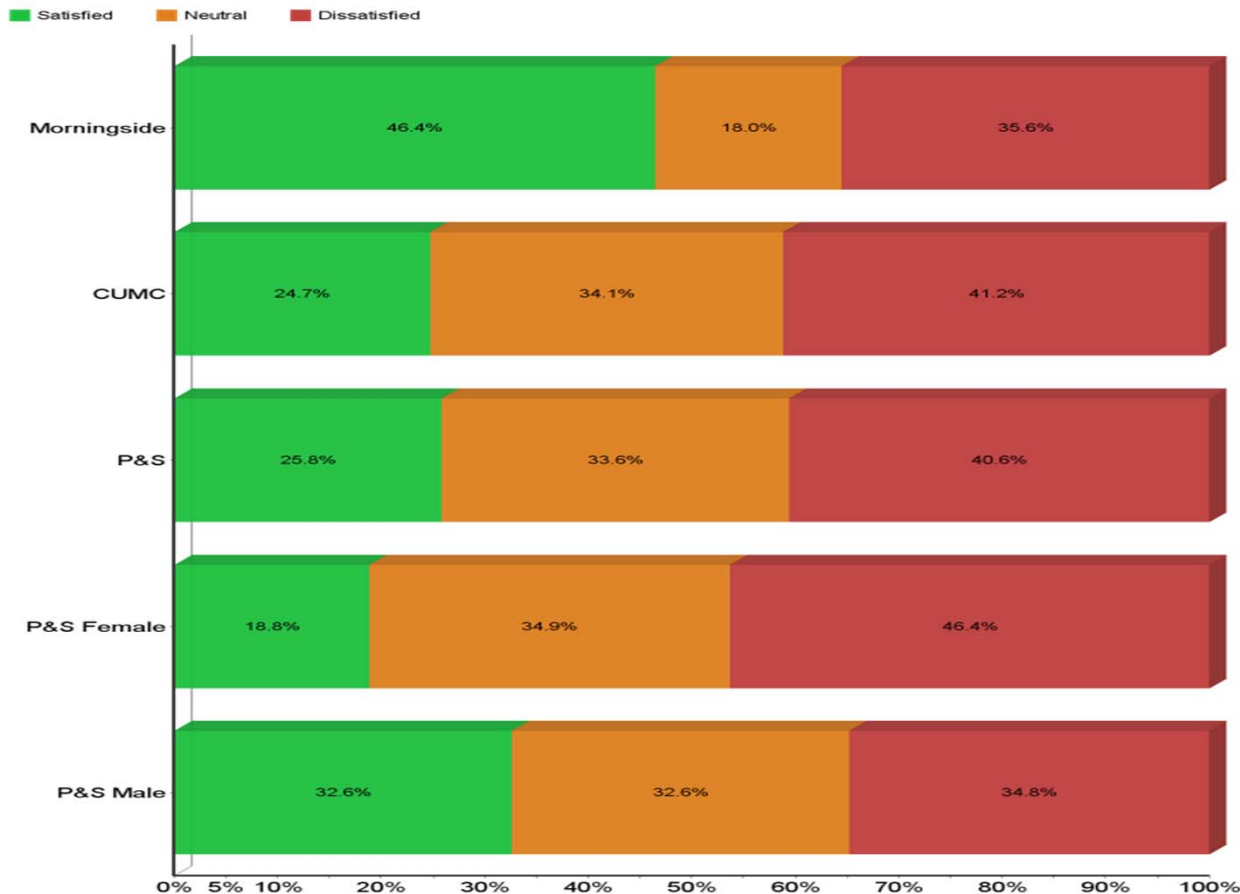


- Among female P&S faculty, as many are dissatisfied with salary as are satisfied.
- **43 percent of female P&S faculty are satisfied with their salary as compared with 54 percent of male P&S faculty**

Morningside n=531; CUMC n=937; P&S n=779; P&S Female n=361; P&S Male n=391

P&S Faculty Satisfaction in key areas: (2) Research Funds

More specifically, please indicate the degree to which you are satisfied with each of the following: Research funds

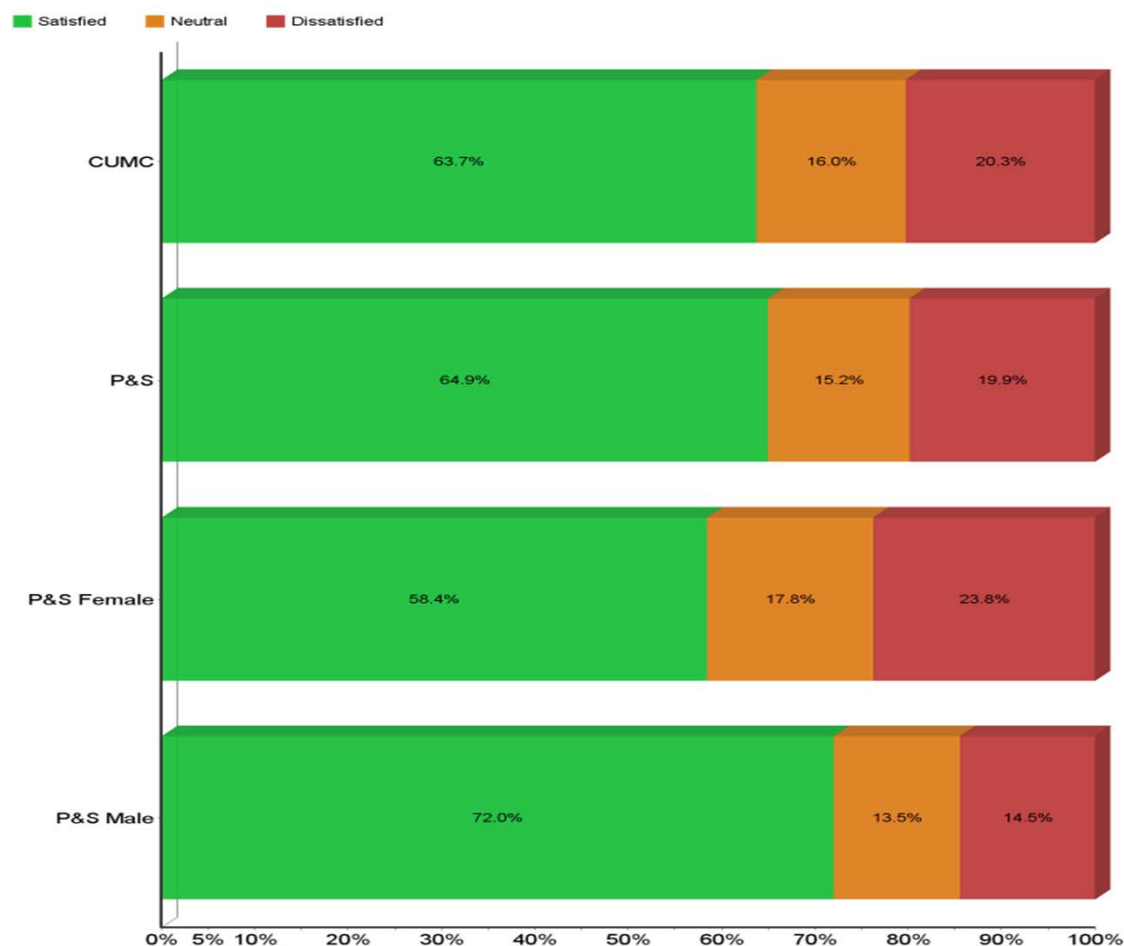


- Among female P&S faculty, more than twice as many are dissatisfied with research funds as are satisfied
- **19 percent of female P&S faculty are satisfied with research funds as compared with 33 percent of male P&S faculty**

Morningside n=483; CUMC n=716; P&S n=589; P&S Female n=261; P&S Male n=310

P&S Faculty Satisfaction in key areas: (3) Clinical Responsibilities (CUMC only)

More specifically, please indicate the degree to which you are satisfied with each of the following: Clinical responsibilities



- Among female P&S faculty, less than 60 percent are satisfied with their clinical responsibilities as compared with 72 percent of male faculty

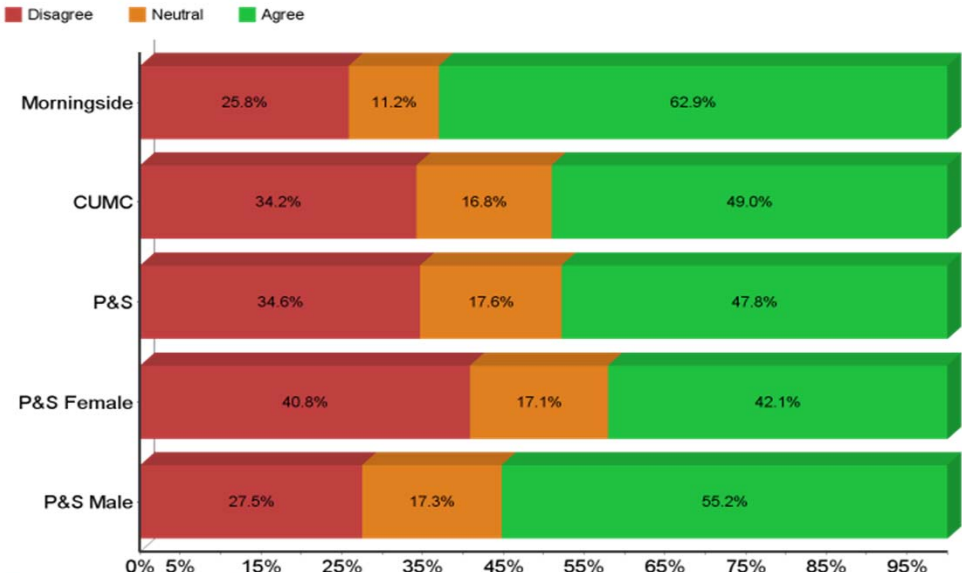
CUMC n=639; P&S n=572; P&S Female n=269; P&S Male n=282

Climate and Opportunities (1)

Please indicate your agreement or disagreement with the following statements regarding your department or school

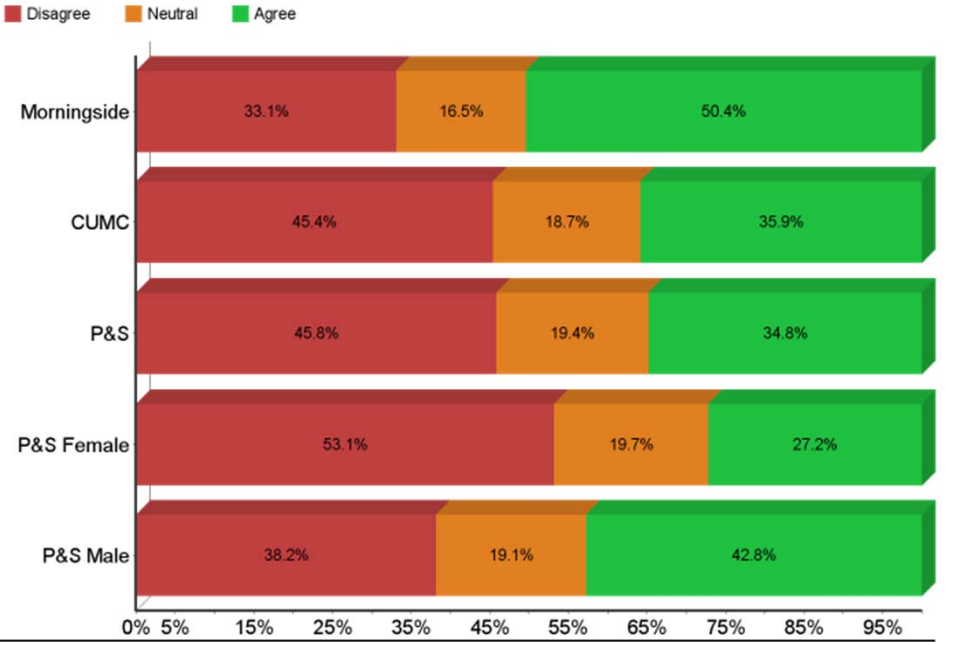
I feel recognized for my contribution to Columbia University

[Morningside n=472; CUMC n=786; P&S n=647; P&S Female n=304; P&S Male n=324]



I have the resources I need to do my job well

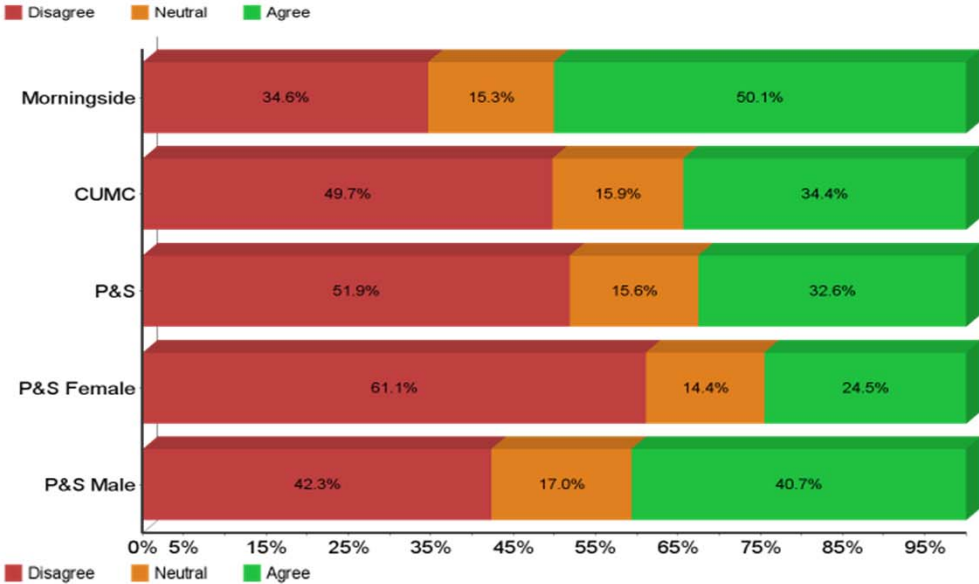
[Morningside n=478; CUMC n=788; P&S n=650; P&S Female n=305; P&S Male n=325]



Climate and Opportunities (2)

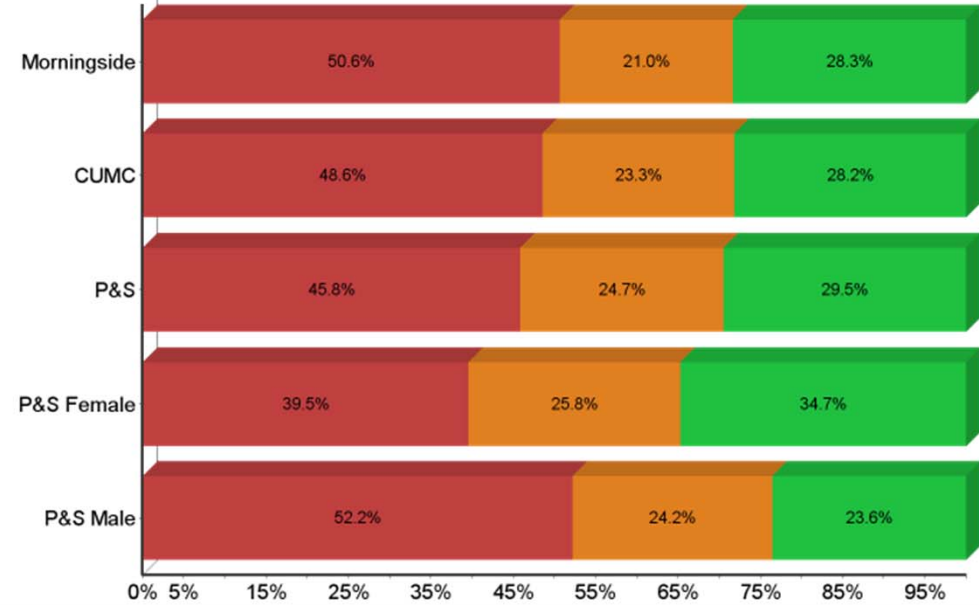
I have a voice in the decision-making that affects the direction of my department/school

[Morningside n=471; CUMC n=781; P&S n=642; P&S Female n=298; P&S Male n=324]



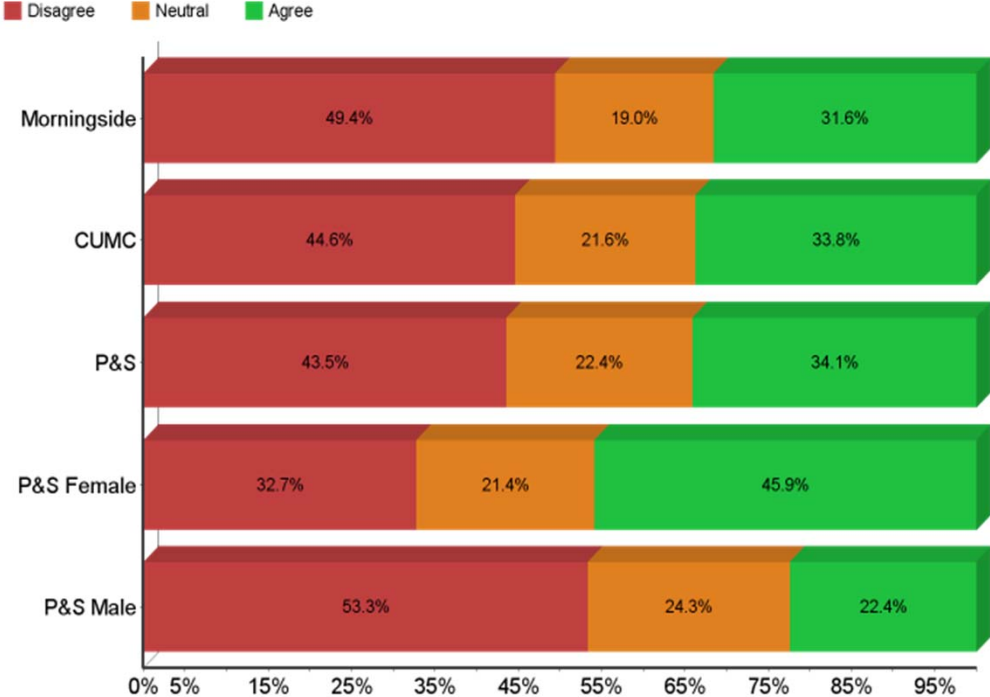
I feel excluded from an informal network in my department/school

[Morningside n=466; CUMC n=760; P&S n=624; P&S Female n=291; P&S Male n=314]



Climate and Opportunities (3)

I have to work harder than some of my colleagues to be taken seriously

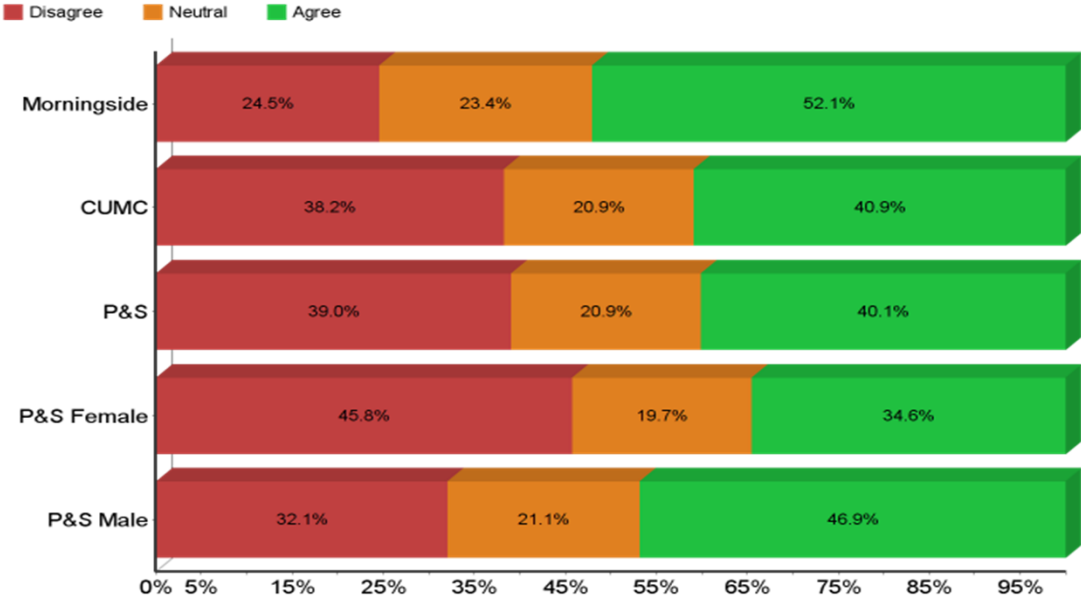


[Morningside n=468; CUMC n=764; P&S n=630; P&S Female n=294; P&S Male n=317]

Climate and Opportunities (4)

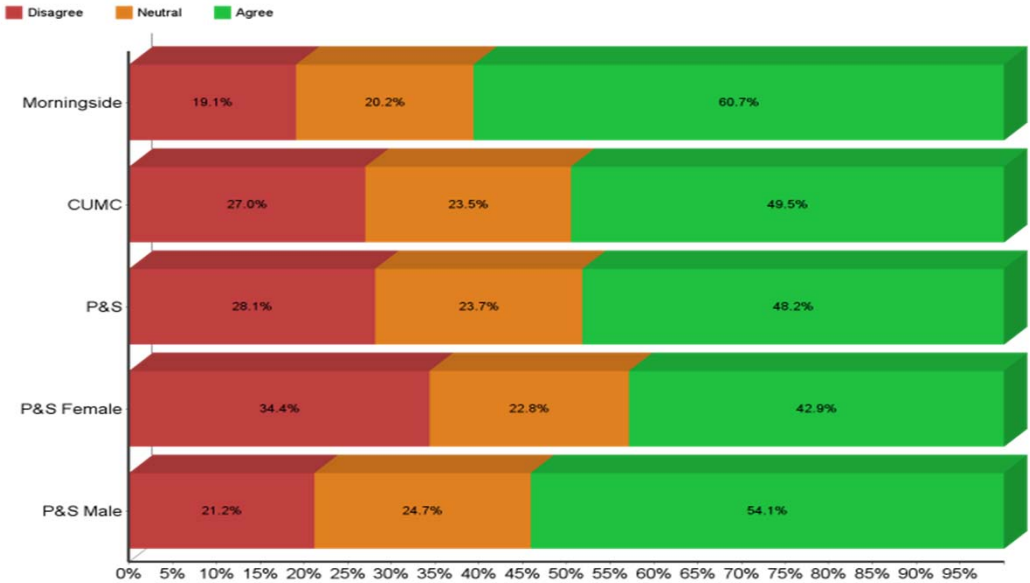
My chair/dean helps me obtain the resources I need

[Morningside n=445; CUMC n=767; P&S n=633; P&S Female n=295; P&S Male n=318]



My department / school is a place where individuals may comfortably raise personal and/or family responsibilities when scheduling obligations

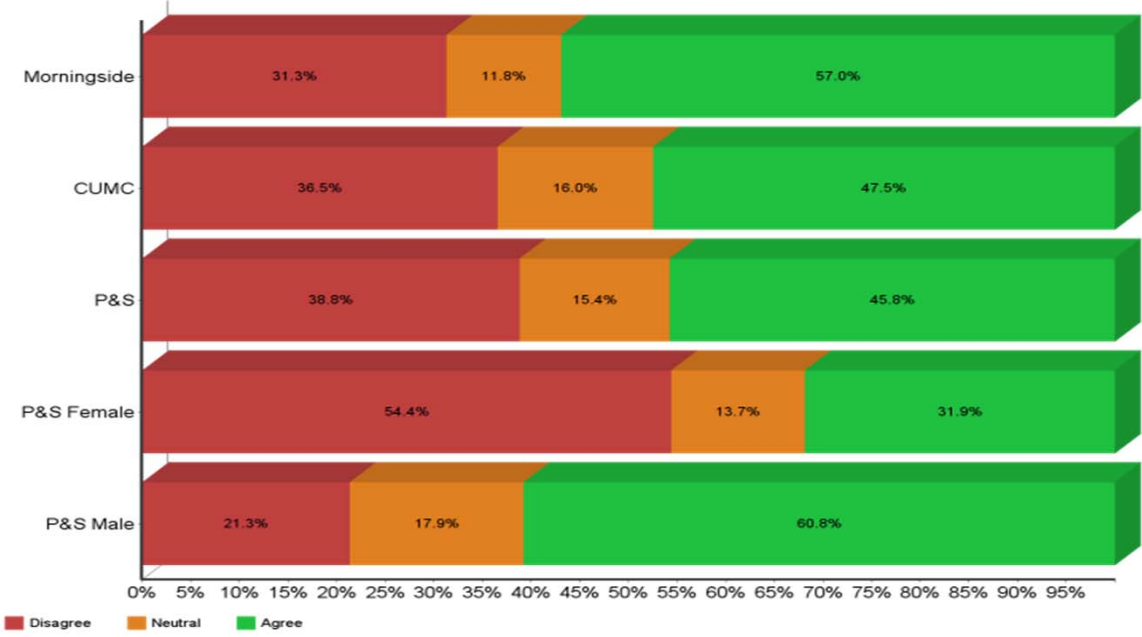
[Morningside n=450; CUMC n=762; P&S n=629; P&S Female n=294; P&S Male n=316]



Climate and Opportunities (5)

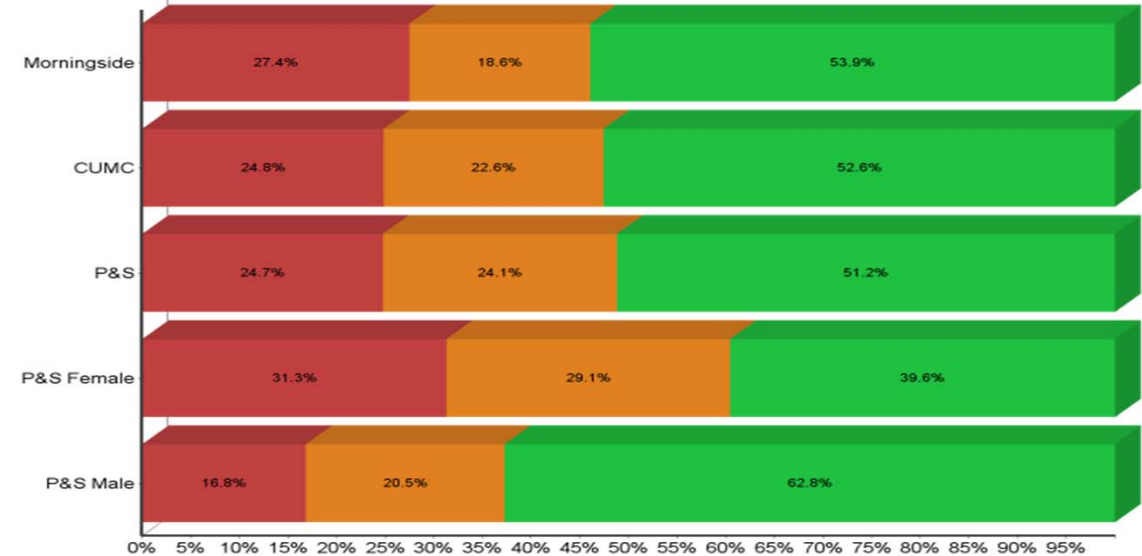
I feel that the climate and opportunities for female faculty in my department/school are at least as good as those for male faculty

[Morningside n=451; CUMC n=750; P&S n=618; P&S Female n=307; P&S Male n=291]



I feel that the climate and opportunities for minority faculty in my department/school are at least as good as those for non-minority faculty

[Morningside n=419; CUMC n=711; P&S n=582; P&S Female n=265; P&S Male n=298]



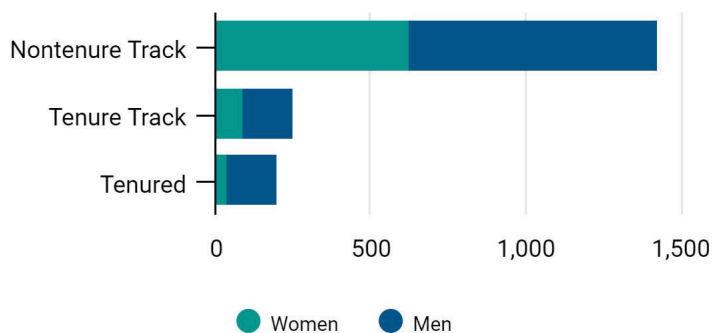
End of Presentation

Columbia University Senate: Commission on the Status of Women

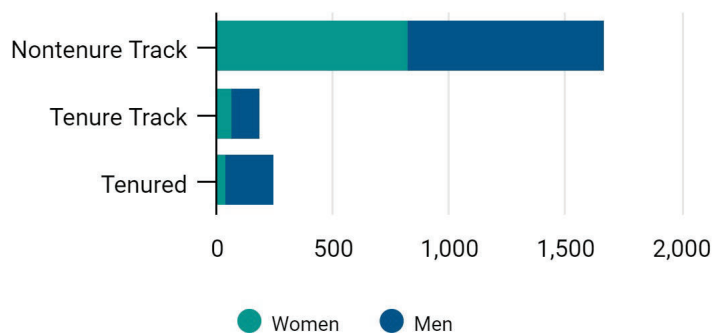
The Advancement of Women Faculty through the Academic Ranks: Vagelos College of Physicians and Surgeons Pipeline Study

In 2017-18, the Commission on the Status of Women completed this study into the advancement of women faculty at the Vagelos College of Physicians and Surgeons, working closely with the Office of the Vice Provost for Faculty Affairs and the Office of Academic Appointments.

Total Faculty by Tenure Status 2007-08



Total Faculty by Tenure Status 2016-17



Faculty: 2007-08 to 2016-17

- Total faculty: Share of women increased from 40% to 45%
- Nontenure track faculty: Share of women increased from 44% to 51%,
- Tenure track faculty: Share of women faculty increased slightly from 35% to 38%
- Tenured faculty: The share of women faculty remained flat - from 18.2% to 18.8%

Leadership in 2018:

- 11.1 % of department chairs are women
- 28% of division chiefs are women
- 13.3 percent of center directors are women

POLICY RECOMMENDATIONS

Transparency

Institutionalize best practices in all hires, including division chiefs, to increase transparency

Equity

Establish equity targets to ensure women hold senior and leadership positions in numbers consistent with their representation in academic medicine

Evaluation

Evaluate candidates comparatively through the use of predictive tests and structured interviews for comparison purposes

Leadership

Implement leadership terms, with limits, to increase opportunities for alternative candidates

Sponsorship

Implement sponsorship - as distinct from mentorship

Cultural shift

Implement unconscious bias training for all institutional leaders to address gender and racial bias

**The Advancement of Women Faculty through the Academic Ranks:
Columbia University Vagelos College of Physicians and Surgeons Pipeline Study
University Senate Commission on the Status of Women**

April 27, 2018

1. The Commission on the Status of Women undertook this study into the advancement of women faculty in the Vagelos College of Physicians and Surgeons working closely with the Office of the Provost's Faculty Affairs Division. The Commission presented its first findings to the University Senate in February 2018 and in this report, we summarize these findings and the strategies and recommendations to address this situation.
2. Considering the period 2007-08 to 2016-17, the Commission found that:
 - 2.1. The number of women faculty increased by 30 percent and the number of men faculty increased by 1 percent, with women faculty accounting for 45 percent of total faculty in 2016-17, as compared with 40 percent in 2007-08.
 - 2.2. The greatest increase in the total share of women faculty is seen on the nontenure track, with a 37 percent increase in women faculty and 4 percent increase in men faculty over this period, with the result that women faculty accounted for 51 percent of all nontenure track faculty in 2016-17, up from 44 percent in 2007-08.
 - 2.3. The number of tenure track faculty decreased by 23 percent over this period, from 249 to 191, with an 18 percent decrease in women faculty (from 88 to 72) and a 26 percent decrease in men faculty (from 161 to 119), with the result that women faculty accounted for 38 percent of all tenure track faculty in 2016-17, up from 35 percent in 2007-08.
 - 2.4. The total number of tenured faculty increased 26 percent over this period, with a 30 percent increase in the number of tenured women, from 36 to 47 (11), and a twenty-five percent increase in the number of tenured men, from 162 to 203 (41). Women accounted for 18.8 percent of all tenured faculty in 2016-17, up from 18.2 percent in 2007-08.
 - 2.5. In summary, in 2016-17, 12.3 percent of all women faculty and 28.0 percent of all men faculty were tenured or on tenure track, as compared with 16.5 percent of women faculty and 28.7 percent of men faculty in 2007-08.
 - 2.6. Considering leadership in 2018:
 - 11.1 percent of department chairs are women;
 - 28.0 percent of division chiefs are women;
 - 13.3 percent of center directors are women.

3. Based on these findings and noting that interventions solely aimed at individual faculty development are not sufficient to advance women into leadership or tenured positions, the Commission recommends implementing institutional change to support the environment for and the advancement of women:
 - Leadership must adopt transparency in the hiring processes, institutionalizing best practices in hiring in all leadership searches, including those for division chiefs;
 - Leadership terms, with limits, should be introduced to increase opportunities for alternative candidates and enhance accountability;
 - Sponsorship, as distinct from mentorship, should be implemented;
 - Applicants should be evaluated comparatively through the use of predictive tests and structured interviews for comparison purposes;
 - Institutions should establish equity targets to ensure that women occupy senior and leadership positions in numbers consistent with their representation in academic medicine. Departmental progress should be measurable and transparent, with leadership held accountable in annual departmental and institutional reporting;
 - Bias training: All institutional leaders and all search committees should complete unconscious bias training to address gender and racial bias in the institution and academia. This is a first step in making the cultural shift required to be more inclusive of diverse leadership styles.
 - The Commission seeks to engage with CUMC leadership in the review and implementation of these recommendations, measuring progress over time.
4. There is significant opportunity for improvement at the national level, and the Commission's hope is that Columbia University will seek to lead the field and set the standard for academic medicine in the United States.

Commission on the Status of Women

2017-2018

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2004-2013 UPDATE: ADVANCEMENT OF WOMEN THROUGH THE
ACADEMIC RANKS OF THE COLUMBIA UNIVERSITY GRADUATE SCHOOL OF
ARTS AND SCIENCES: WHERE ARE THE LEAKS IN THE PIPELINE?

*Commission on the Status of Women
& Prof. Daniel Rabinowitz (Dept. of Statistics)*

Presented by:

Dr. Maya Tolstoy

Department of Earth & Environmental Sciences

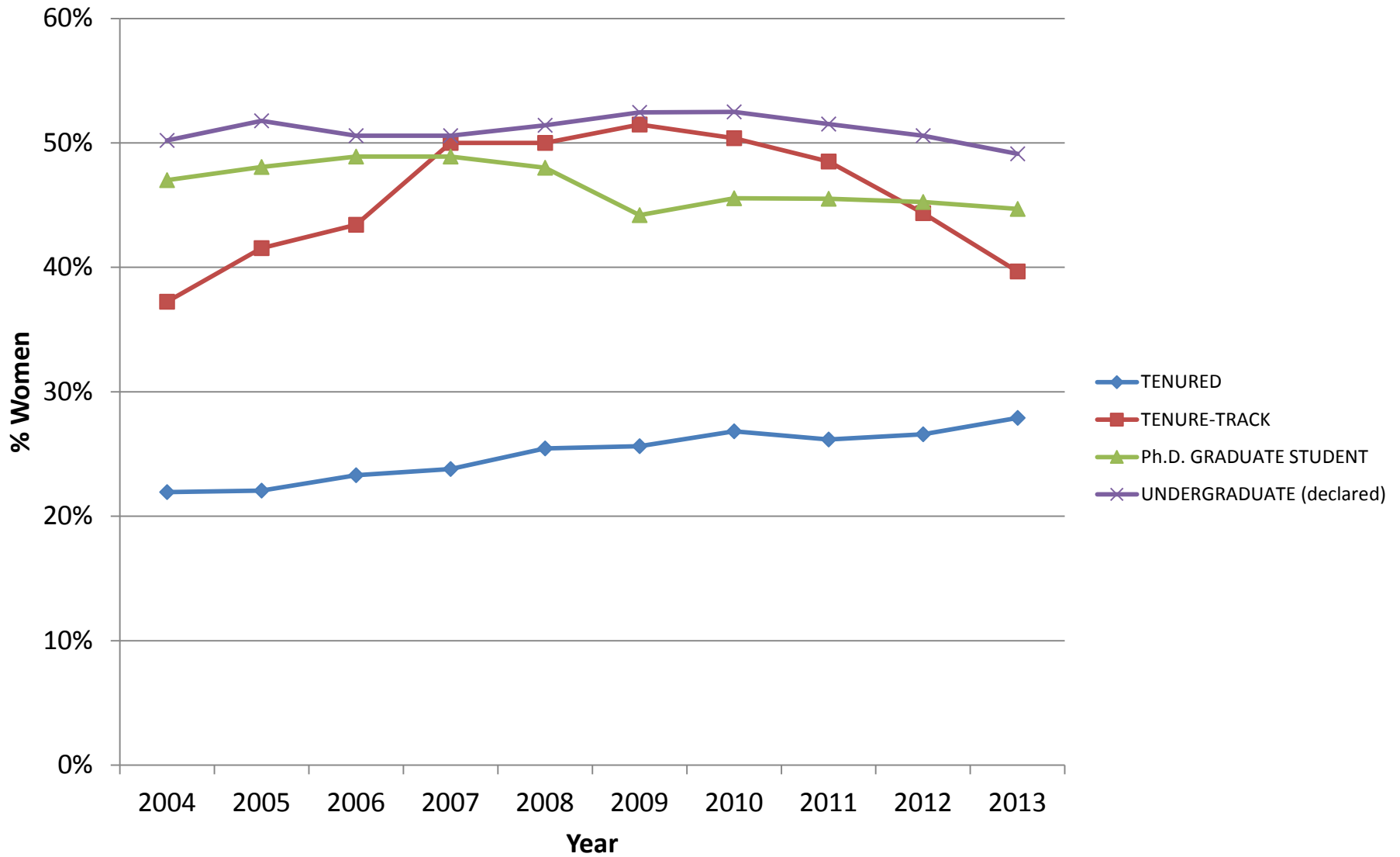
Lamont-Doherty Earth Observatory

Special Thanks to:

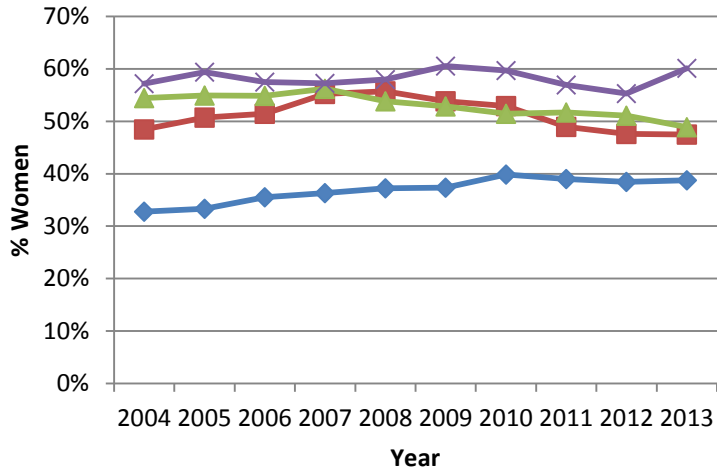
David Madigan, Executive VP Arts and Sciences

Dennis Mitchell, Senior Assoc. Provost for Faculty Diversity and Inclusion

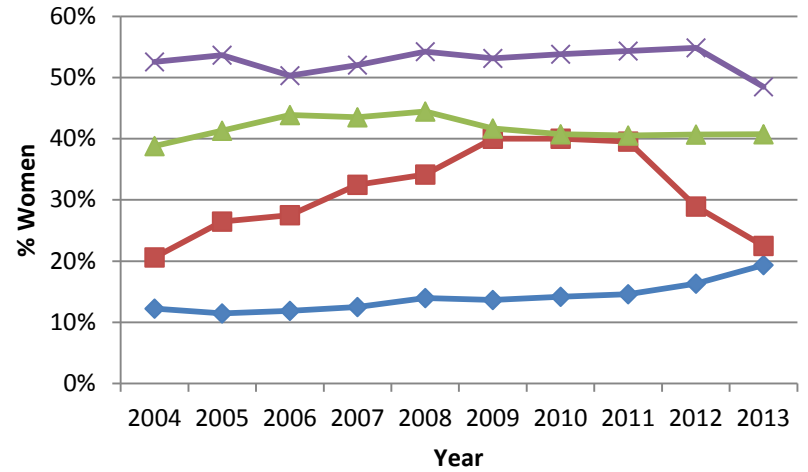
Arts & Sciences 2004-2013



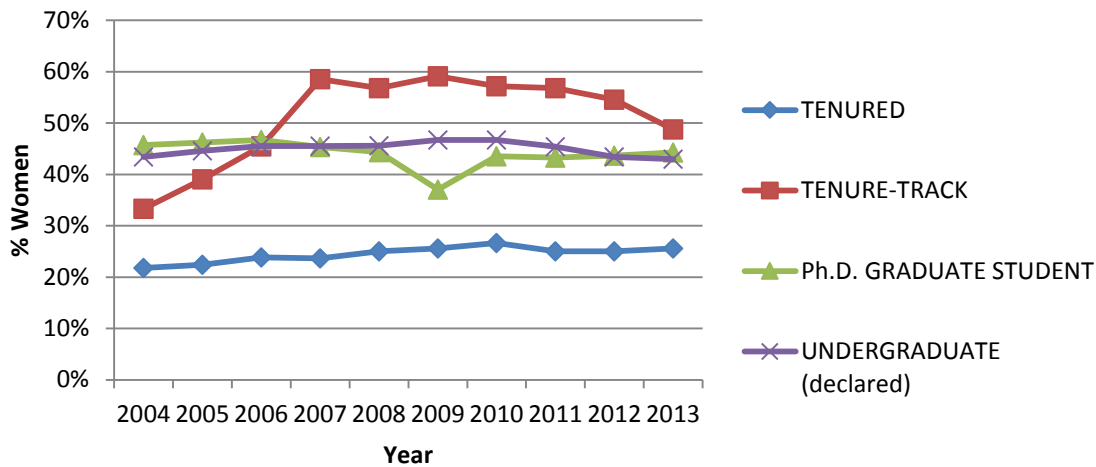
Humanities 2004-2013



Natural Sciences 2004-2013



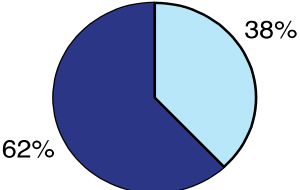
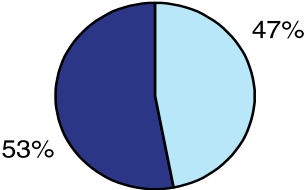
Social Sciences 2004-2013



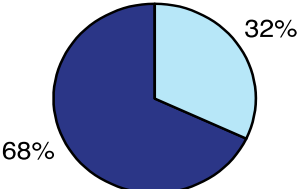
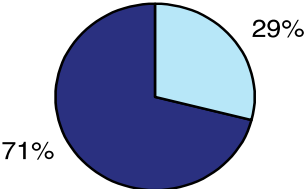
- ◆ TENURED
- TENURE-TRACK
- ▲ Ph.D. GRADUATE STUDENT
- ✕ UNDERGRADUATE (declared)

**INTERNAL PROMOTION
TO TENURE**



**EXTERNAL HIRE
TO TENURE**

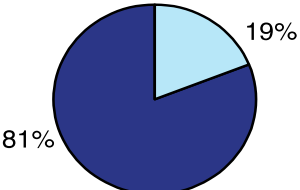
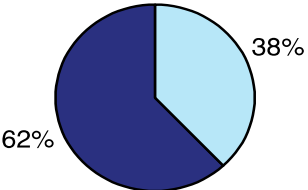


HUMANITIES

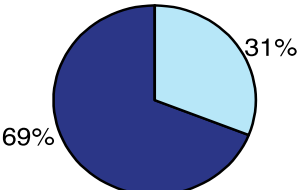
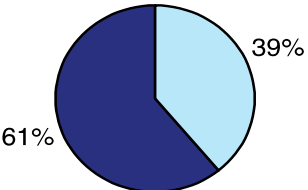


SOCIAL SCIENCES

 % female
 % male

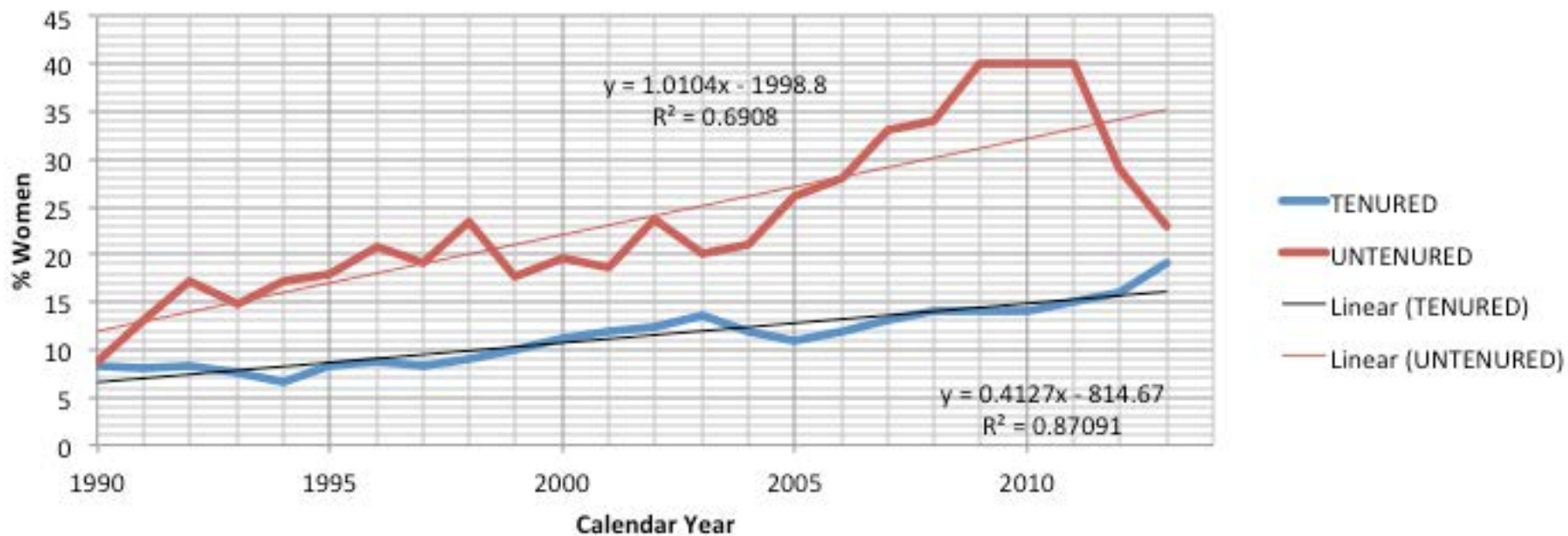


NATURAL SCIENCES



ALL OF A&S

Natural Sciences



PIPELINE TRENDS

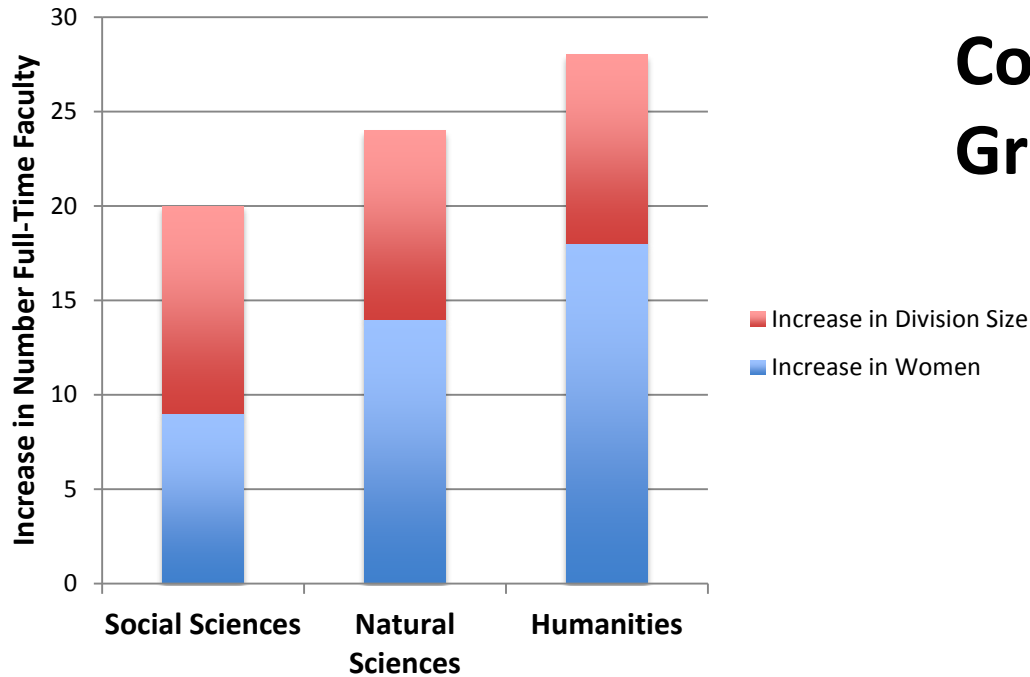
Tenured % women slowly improving, but rate hasn't changed significantly from the 1990's. Almost a century till parity in Natural Sciences.

Non-tenured % women has been decreasing in the last several years, particularly in the Natural Sciences.

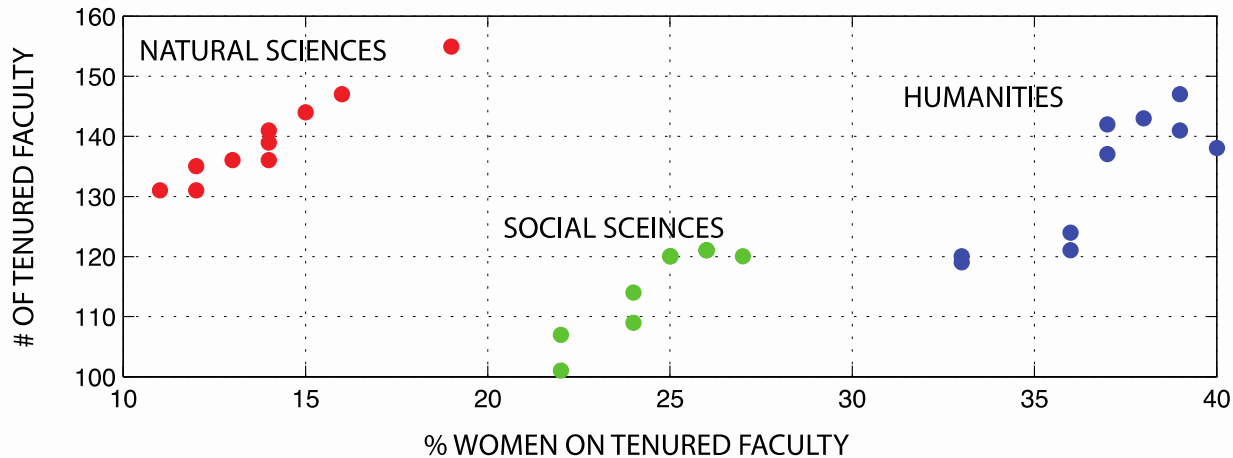
Tenured women in Humanities and Social Sciences appears to have stalled in the last 3-5 years of the study.

Promotion more effective than external hire for getting women onto tenured faculty.

Increase in Women Relative to Increase in Division Size



Connection between Growth and Diversity



CLEAR LEAKS IN THE PIPELINE

Untenured Women in Social Sciences are significantly more likely to leave the untenured ranks immediately prior to going up for tenure than men.

Women are more likely than men to depart from tenured ranks, though it is not statistically significant. However, the lack of significance is at least in part because the pool is so small.

The recent drop in hiring of women at the untenured level is going to negatively impact progress at the tenured levels without focused efforts to hire more women at both the tenured and untenured ranks.

ISSUES TO ADDRESS MOVING FORWARD

All politics is local – responsibility for diverse and equitable hiring and promotion practices starts at the department level. Solutions need to be tailored to the issues facing specific departments from low pipelines to hiring practices.

Departments within Arts and Sciences have not been particularly pro-active in accessing the most recently available diversity funds. This may in part be because communication about accessibility of these funds seems minimal at the department level, and confusion abounds.

Many of the conclusions of the first pipeline report still hold true, and many of the recommendations appear to remain unimplemented.

Conclusions and timeliness of this report were significantly hampered by lack of access to relevant data, and lack of staff to help assemble and analyze the data. This appears largely to be because data is not collected in a consistent and readily accessible fashion as recommended by the previous pipeline report.

RECOMMENDATIONS

DATA NEEDS

- *Increase size of Institutional Research Office*
- *Conduct MIT-Style Survey of Women Faculty*
- *Conduct Quality of Life Survey (initial and follow-up)*
- *Follow-up on under-represented minorities
(New Senate Commission on Diversity)*

HIRING PRACTICES

- *Appoint A&S faculty point person*
- *Broad dissemination of info on diversity hiring opportunities*
- *Improve flexibility of funds*
- *monitor Natural Sci (all ranks), and Soc. Sci (tenured)*

RETENTION AND RECRUITMENT

- *Ensure Best Practices*
- *Be attentive to issues that may unintentionally discriminate*
- *Diversity best achieved in environment of stable growth*

EXPANDING PIPELINE STUDIES

- *Expand studies to other schools (and under-represented minorities)*
- *Make data public*

2004-2013 UPDATE: ADVANCEMENT OF WOMEN THROUGH THE ACADEMIC RANKS OF
THE COLUMBIA UNIVERSITY GRADUATE SCHOOL OF ARTS AND SCIENCES: WHERE ARE
THE LEAKS IN THE PIPELINE?

Commission on the Status of Women & Prof. Daniel Rabinowitz (Dept. of Statistics)
Columbia University Senate*

April 30, 2015

Original Report by:

*The Commission on the Status of Women
November 2001
With updated data in 2004.*

*Commission Membership as of April 2015:

Erin Bryk
Pam Cobrin (Chair)
Katie Conway
Mercy Davidson
Lucy Drotning (ex officio)
Kuheli Dutt
Suzanne Goldberg
Carol Hoffman (ex officio)
Candice Kail
Francine Kershaw
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Institutional Research)
Initial Framing of Study: S. Goldberg & M. Tolstoy (former co-chairs CSW)

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Executive Summary

The Columbia University Arts and Sciences faculty strive for excellence in all that they do from educating the next generation of undergraduate students and advising graduate students to conducting research, writing, and other scholarship. Excellence is best obtained through a diversity of perspectives, opinions and approaches toward a common goal. As such, faculty diversity is critical to attaining the best scholarship in research endeavors, as well as to providing the student body with the best education and with role models who reflect student diversity.

This report provides a review of one facet of diversity on campus: the progress of women through the academic pipeline within Arts and Sciences at Columbia University, during the 10-year period of 2004-2013 (ending with academic year 2013-2014). The work here follows the [original pipeline study](#) presented in 2001, with updated data added in 2004. While diversity of many types is important – and while Columbia should be attentive to building a faculty that is reflective of the gender, race/ethnicity and other characteristics of the world it seeks to educate and study – this report focuses specifically on gender diversity because of its genesis in the *Commission on the Status of Women*, a subcommittee of the Columbia University Senate, whose mandate is to examine the status, equity, and opportunities available at Columbia to women.¹

The data show that during the first half of the decade the representation of women, particularly at the untenured level, improved significantly. This coincided with both the start of a period when attention and resources were focused on improving the ratio of women faculty within Arts and Sciences at Columbia, and a period of growth for the faculty of Arts and Sciences in general. However, as diversity efforts broadened and Arts and Sciences growth slowed, the situation returned to ‘business as usual’, and tenure-track ratios fell to at or near the levels at the start of the decade, led largely by a decline in Natural Sciences.

The progress in the tenure-track ranks during the early part of the decade demonstrates that the women are there in the pipeline, and that the situation can be addressed quite quickly if resources are available, department willingness is there, and the leadership is focused on these goals. However, the lack of progress in more recent years suggests that the converse is also true: without dedicated resources, willingness, and leadership in this area, Columbia will lose ground.

¹ While our study does not focus on diversity in terms of underrepresented minorities, we include those data, and think that many of the steps proposed herein will be applicable to improving diversity on many levels.

As with the previous report, the underrepresentation of women is most pronounced in the Natural Sciences, still quite pronounced in the Social Sciences (at the tenured level), but less problematic in the Humanities. At present rate of growth, the Natural Sciences will not reach parity until near the turn of the next century. Ratios of the graduate student body are within 10% of parity within all divisions, and have been for at least a decade. Thus the talent pool exists, and more should be done to attract and retain the top scholars of both genders.

Two particularly concerning leaks in the pipeline were identified. The first is that women appear to be leaving Social Sciences positions immediately prior to going up for tenure at a rate strongly disproportionate to men. Second, while the numbers are small, it also appears that women are more likely to leave, once tenured, across all three divisions.

Arts and Sciences, and the departments therein, must re-focus on recruiting and retaining top faculty members who are women at both the untenured and tenured levels. This responsibility lies functionally within departments, but also requires leadership at all levels within Arts and Sciences, as well as resources from Arts and Sciences and from Columbia at large. In addition, the negative impact of zero or limited growth of faculty numbers on the improvements in diversity of faculty should be considered.

Several recommendations are made to address the trends that appear in the data examined for this study:

- The University must be more systematic in collecting data so that less work needs to be put into extracting data, and more work can go into analyzing it. Additionally we recommend that more data be collected in terms of surveys within Arts and Sciences: 1) an MIT-style survey of women's committee and teaching workload, offices, lab space, salary and other similar points of comparison relative to male colleagues, and 2) an initial and follow-up 'quality of life' web-based survey, particularly targeting women faculty, both junior and senior, to try to establish why some groups are leaving at greater rate than their male colleagues, and to highlight aspects that may be working well. Further, as highlighted in the previous pipeline report, we recommend that the university consider conducting, and making openly available, pipeline studies for other schools at Columbia, in particular schools where women are known to be underrepresented, such as the Engineering School and the Business School.²

² One of the biggest challenges in completing this study, and in understanding root causes was lack of access to adequate data. As a result, our study is less comprehensive than the previous study, particularly in the area of hiring and departures. We recommend that the university invest more resources in collection and analysis of institutional data. This requires leadership from Columbia to commit to studying the issue.

- There must be a continued focus on diversity in hiring to recover to the diversity of untenured hiring rates from the early to middle part of this survey period, and hopefully improve on the diversity of external hires into the tenure ranks. Specifically, we recommend 1) that special attention be paid to hiring in Natural Sciences and Social Sciences, 2) that a tenured faculty member point-person within Arts and Sciences be appointed to track progress and help engage departments in diversity hiring opportunities, 3) that information on available resources for diversity hires is more broadly disseminated, and 4) that there is improved flexibility in hires through diversity resources, including timing of funds and a broader scope of use of funds.
- The disproportionate departure of women from the tenured ranks, in addition to the overall pipeline issues, suggests that attention to and dissemination of current research and relevant best practices happen in a more systematic fashion in order to allow for those involved in recruitment, and retention of faculty to be attentive to issues that may unintentionally discriminate against women.

1. Introduction

In 2001, Columbia's *Commission on the Status of Women* conducted the first pipeline study at Columbia, looking at data from 1990-2000, with an updated analysis in 2004, to track the progress of women through the Columbia University pipeline from undergraduate to tenured professor ([Commission on Status of Women, 2001; 2004](#)). That study concluded that progress toward equity was slow, and provided specific recommendations to help improve the rate of progress.

Some of the recommendations from the original pipeline report were followed and others appear not to have been – however, it was hard to even get data on what data is collected and where, and what processes are in place. Importantly, in 2004, a new office was created, led by Professor Jean Howard (George Delacorte Professor in the Humanities and currently Chair of the English Department) as the first Vice-Provost for Diversity, and followed in 2007 by Professor Geraldine Downey who led the office until 2009. In 2010 Professor Andrew Davidson was appointed to lead the Office of the Vice Provost for Academic Planning, which extended and replaced the work of the Office of the Vice Provost for Diversity. Some significant progress toward improving the pipeline has been made in the last decade, in large part because of this office, but progress at the tenured level is still slow.

The literature on the slow progress of women through the academic pipeline is substantial and there are an increasing number of studies that demonstrate how women are subjected to bias in evaluation of their accomplishments, particularly in the sciences (e.g. Valian, 1998; Steinpres et al. 1999; Trix & Psenka, 2003; Davies et al., 2005; Madera et al, 2009; Moss-Racusin et al, 2012; Reuben et al., 2014). This includes bias in obtaining funding (Brouns, 2000; RAND, 2005), differences in how letters of reference are written that negatively impact women (Trix & Psenka, 2003; Madera et al., 2009), lower salaries (Shen, 2013) that don't progress as fast as men (Valian, 2005), and in one study, the conclusion that women had to have 2.5 times more publications than men to achieve the same rating on scientific competence (Wenneras and Wold, 1997). It should be noted that both men and women have been shown to hold such unconscious biases (e.g. Steinpres et al. 1999; Moss-Racusin et al, 2012). In some areas of Natural Sciences that include field work, it has been shown that an alarming proportion of women have been subjected to sexual harassment (~71%) and even assault (~26%) during field work, most often by male colleagues who were senior to them (Clancy et al., 2014). Given these challenges, it is perhaps not surprising that women often leave the academic track at rates disproportionate to men.

The data presented here provide no information on causes for the slow progress of women toward the tenured ranks at Columbia, nor for any specific leaks in the pipeline where women become less well represented as seniority increases. At the tenured ranks progress will necessarily be most slow, since that represents the longest period of residence within one rank, and those ranks are still populated by a generation that was hired at a time when few women entered academia, especially in the sciences. However, the steady drop in women from undergraduate to graduate to tenure-track professor is happening despite

strong representation of women in the preceding ranks for longer than the duration of the residence in any given rank, bar tenured professor. Therefore it can be concluded that those leaks at the more junior level are not simply a result of past policies or practices that have since been reformed.

In [1999](#) & [2002](#) studies by the women tenured professors at MIT highlighted that they felt marginalized and demonstrated that they were being treated significantly differently from their male peers in everything from committee assignments, to lab space, to response to outside offers and salary. The leadership of MIT took a proactive approach to these findings and took steps to remedy the inequalities, leading to a significant improvement of morale among the women scientists, though it was clear in a follow-up [2011 study](#) that focus on the issues needs to be retained. No such study has been conducted at Columbia to date. We recommend that such a study be conducted as soon as possible.

We make this and other recommendations to try to better understand some possible causes of observed issues, but this report primarily seeks to document the progress, or in some cases, lack of progress, throughout Arts and Sciences. Data is described in terms of the overall picture in Arts and Sciences as well as at the divisional level (Humanities, Social Sciences, Natural Sciences), and occasionally at the department level. We also document the progress of underrepresented minorities through the ranks, but the analysis is focused on women, as a *Commission on the Status of Women* report. We hope that the newly forming Senate *Commission on Diversity* will follow up with more detailed analysis on underrepresented minority diversity.

2. Data and Report Approach

The biggest challenge facing this report of was lack of resources to conduct the analysis, and lack of data collection on salient topics. Despite clear recommendations in the last pipeline report for collection of data about arrivals and departures it proved impossible to even access some key pieces of data that were available when the last pipeline report was issued. For instance, the last report highlighted the problem of lack of women in the ‘target of opportunity’ hires into the tenured ranks over the 1990-2000 period. We suspect that the statistics would have improved since most of the hires made through the office of the Vice Provost for Diversity were done as target of opportunity hires. However, it proved impossible to get these data since they were apparently not collated anywhere, and the administrative personnel time to go through the raw data was not available.

Additionally, the original collated data that we were given for the tenure-track positions turned out to include a significant number of off-track positions, so we could not use it. This delayed the report by approximately a year and the analysis that had been completed to that point had to be redone. The final faculty data we got in raw format from Arts and Sciences, and authors of this paper had to process it themselves from scratch. This was a significant time sink, and these kinds of barriers to studying this important problem should not be in place.

One key recommendation we make is that the size of the institutional research office be increased so that pipeline data can be maintained with care and detail, including, hires, types of hires, departures and reasons for departures. This will help a great deal with transparency and identifying issues on something less than a decadal time scale. We note that all the administrators and staff that we worked with on this project were extremely helpful, but significantly overworked already. Columbia has one of the smallest institutional research offices in the Ivy League.

Because of the limitations of the data we had, our analysis in some cases is less detailed than provided in the original report, but with some expert assistance from the Statistics Department through their [free consulting program](#), we were able to conduct some important statistical analyses of the data, described in Section 4.

Most of our analysis is by division, since numbers in individual departments are too small to draw broad conclusions from. However, ultimately, the story is one that varies department by department, with some departments making significant progress in gender diversity and others going backwards.

As a result of the limited resources, we also focus most of our analysis on the faculty end of the pipeline (tenure-track and tenured) where the drop off in representation of women is most pronounced.

3. Observations

Figures 1-8 and Tables 1-4 show the 2004-2013 pipeline data for Arts and Sciences as a whole and broken down into divisions (Humanities, Natural Sciences, and Social Sciences). Figures 9-11 show the trends for tenure-track and tenured faculty from 1990-2013, for comparison with the trends observed in this study.

Undergraduate Students

The data show that, at the undergraduate level, women make up ~50% of the student body (noting that the undergraduate data is necessarily limited to those who have declared a major or concentration). This is the entry point over which Columbia central administration has the most control. When looking at divisions, while percentages fluctuate from year to year, no clear trend is apparent, and women make up on average 58% of Humanities majors, 53% of Natural Sciences majors and 45% of Social Sciences majors.

Graduate Students

At the graduate level, overall in Arts and Sciences, women make up on average about 47% of the student body, with a slight trend toward decreasing over time. This number reflects a divisional average of 53% in humanities, 42% in Natural Sciences and 44% in Social Sciences.

Most notable is the 11% drop in the Natural Sciences Ph.D.'s with respect to the undergraduate student body, and the fact that these numbers have been low in the most recent few years (41%) compared with a high of 44% over several years in the first half of this study period. This is the start of a series of leaks in the pipeline for Natural Sciences.

Social Sciences are notable for having almost no drop in the representation of women relative to the undergraduate student body. With the exception of one year (2009), the numbers are within a few % of each other, and sometimes the graduate student body actually has a higher % of women than the undergraduate student body. The pipeline into graduate school in Social Sciences therefore appears relatively healthy.

Humanities has a small drop in % women graduate students relative to undergraduate, but both numbers are at or above parity. There was decline in % of women graduate students from a high of 56% to a low of 49% in 2013, which should be watched, and potential causes considered. However, because the numbers are at or near parity, this stage of the pipeline still appears healthy.

We do not have data on gender distribution of students who complete their Ph.D., which is an important factor in considering the pipeline and we encourage further examination of this, particularly where women are heavily underrepresented at the tenure-track level.

Untenured – Tenure Track Faculty

Overall, the % of women on the untenured, but tenure-track faculty increased markedly for the first several years of the study period, coinciding with establishment of the Office of the Vice Provost for Diversity. However, following several years of parity, then numbers declined again, returning almost all the way back to levels seen at the beginning of the study period. This pattern is most pronounced in Natural Sciences, but a decline can be seen in the most recent years in all divisions. However, Humanities tenure-track faculty members have hovered around equity for the entire period (from 48-56% women), so this part of the pipeline is healthy, and broadly aligned with graduate student ratios. Social Sciences also increased from 33% to a high of 59% women, before falling back down to 49%, and actually exceeds the % of women undergraduate and graduate students for most of the last decade. So again, this appears to be a healthy pipeline. Natural sciences saw a dramatic increase from 21% to 40% over the first half of the study period, briefly reaching parity with the graduate student body, but then it plummeted back down to 23% by the end of the decade. This represents an unhealthy situation for the long-term pipeline, because historically a significant portion of the increase in tenured women in the Natural Sciences comes through promotion of internal candidates rather than external hires straight into tenure (Figure 12).

Tenured Faculty

Overall, the % of women in tenured faculty positions in Arts and Sciences has continued to grow at a steady, albeit slow, rate. The rates of growth by division are similar, though somewhat slower in Social Sciences where it grew only 4% over the decade (from 22% to 26%). Social Sciences is notable in that it actually has largely plateaued in the number of tenured women over the last half of the decade, with the highest absolute number and % occurring in 2010 (27%). Humanities grew by 6%, going from 33% to 39%, and is the division closest to parity, but it also has plateaued in the last few years. Natural sciences grew the most, at 7%, but is the division furthest from parity with % of tenured women growing from 12% to 19%. However, since much of that growth came through promotions to tenure, it is concerning that the untenured pipeline in Natural Sciences is now little better (+4%) than the tenured faculty, and so concerted efforts will be needed to maintain any growth in Natural Sciences.

Long-term Trends on the Tenured and Tenure-Track Faculty

While a simple look at the beginning and end numbers of the decade, described in the paragraph above, suggests a slightly more encouraging picture, this method is susceptible to small peaks or troughs in the data. For instances the picture of 7% growth of tenured women in Natural Sciences is due in large part to a 3% jump in the last year (2013) when 6 women were promoted/hired into tenure. The dearth of women in the Natural Sciences untenured pipeline suggest 2013 was anomalous, and that the representation of women at the tenured level is now likely to decrease or remain stagnant without focused efforts to improve it.

Figures 9-11 provide a linear fit to the data back to 1990, and show that overall the trends for tenured faculty have not changed significantly. The long-term trend in Humanities for the tenured faculty is an ~11% increase in the representation of women per decade, which means that at current rates, the Humanities division may reach parity in approximately one more decade. For Natural Sciences, the long-term trend was an increase of ~4% per decade, meaning that at present rates of increase it will take close to 80 years to reach parity, or almost the end of the 21st century. For Social Sciences the rate was only moderately better at a little less than 5%, suggesting about 50 years to parity.

The fact that the long-term trends in growth of tenured faculty don't appear to change significantly over the last decade compared to the previous decade, suggests that without the focused diversity efforts of the last decade things may have gotten significantly worse.

Promotions to Tenure and Tenured Hires

We were provided with tenure statistics across the three divisions for candidates that had been put forward by their departments to Arts & Sciences for consideration for tenure either through internal promotion or as part of an external recruitment. Once reaching this stage, the vast majority of all candidates (~92% for internal, and ~97% for external) were tenured, and if anything, women were slightly more likely to get tenure than men, but the numbers are very small. However, statistical analysis (see Section 4) suggests that women in Social Sciences were less likely than men to reach the stage of being put forward for tenure by their department.

The break down into internal versus external tenure cases provides a snapshot of the relative % of women coming into the tenure-track faculty through internal promotions versus external hires (Figure 12). With the exception of Social Sciences, where women were brought into the tenured ranks at very similar proportions both externally and internally (possibly because a potential problem exists with internal promotion – see Section 4, Promotion to Tenure), the pool brought in through internal promotions was significantly richer in women. This is particularly true in the Natural Sciences where the internally promoted pool had double the proportion of women to the external hires (38% vs. 19%). This is especially concerning given the recent downturn in representation of women on the untenured Natural Sciences faculty, where the most recent percent of women is only 23%, making it unlikely that the internally promoted pool will be richer than that in the near future.

One of the major points of concern of the previous pipeline report was the dearth of women hired through 'target of opportunity' hires as opposed to through open searches. For the 1990-2000 period, it was noted that in Natural Sciences of 11 target-of-opportunity hires, zero were women. We were not able to get gender data on the target-of-opportunity hires made in the decade of our study from 2004-2013. Despite recommendations by the last pipeline that these data be carefully tracked, no one appears to be doing so. However, these

numbers should have improved (from zero in the Natural Sciences) given that there were a number of target of opportunity hires through the Vice Provost of Diversity office.

Nevertheless, since there were only 6 female external tenured hires altogether in Natural Sciences, even with the diversity program, compared to 25 men, we suspect that the hiring patterns with respect to gender have not changed substantially outside of directed diversity efforts.

Faculty Pipeline Averages

Figure 13 shows the average relative proportions of women in and flowing through the Columbia Arts and Sciences pipeline, color-coded by division. The aggregate hiring numbers were not made directly available to us, and do not appear to be kept in an organized fashion. Instead we looked through the raw data provided by the office of the Vice-President of Arts, which included hiring dates. With the exception of Social Sciences it is clear that hiring into the (non-tenured) tenure track and promotion to tenure was more effective at increasing tenured diversity than hiring directly onto the tenured faculty, despite focused diversity efforts.

Overall, internal promotions and External hires contribute approximately equally to the numbers of new tenured faculty members, so the dearth of women hired through external searches is a significant drag on the improvement of the tenured ranks, particularly in the Natural Sciences.

Underrepresented Minority Data

Tables 5-7 provide the data for underrepresented minorities from 1992-2014 for undergraduate, graduate student, tenure-track and tenured faculty. Note that for these data the untenured faculty ranks may contain some faculty that Arts and Sciences considers off track faculty, which are not contained in the gender data (see issue outlined in paragraph 2 of Section 2). As mentioned earlier, these data are not the focus of our study, but illustrate another significant diversity problem that the university faces. There is a pronounced drop at the undergraduate to graduate point in the pipeline; relatively similar numbers between the graduate and untenured faculty, suggesting that this point does not represent a huge leak in the pipeline; and a big drop at the tenured faculty level. Of particular note is a recent *decrease* in both the % and the absolute number of underrepresented minority tenured faculty within Social Sciences, suggesting not only possible recruitment issues, but also retention issues. Overall, numbers are alarming small, particularly in the Natural Sciences.

Department-level Changes & Growth in Tenured Faculty

The observations discussed above are made on an Arts and Sciences wide or divisional basis to ensure that numbers are large enough to be meaningful. However, each one of the hires, promotions, retentions and departures are occurring at the department level, and each has

its own story. The previous report noted that in general, growth of departments was a key factor in improvements in diversity, and overall our data back this up, as detailed below.

Division Level Growth

Figure 14 shows the overall growth in tenured faculty numbers within a division compared to the growth in number of tenured women. With the exception of Social Sciences, more than half of the growth in the number of tenured faculty is accounted for by growth in the number of women faculty. The increase in division size is accounted for by 45% women in Social Sciences, 58% women in Natural Sciences and 64% women in Humanities. Figure 15 shows how the improvements in diversity within each division, and Arts and Sciences overall, were closely tied to increases in the number of faculty.

Department Level Growth

However, as Figure 16 shows, growth in women was not accomplished evenly across growing departments. Some departments increased the number of tenured women faculty by a greater amount than the department grew altogether (indicating departing/retiring men being replaced by women). Other departments doubled in size, but didn't hire a single additional woman. As with the previous pipeline report, we provide a list of the 'most improved' departments and 'least improved' departments (page 45). The most improved departments were defined as those that had a > 20% increase in the representation of women, and/or a greater change in the number of women than the change in the department size. The least improved departments were those where the representation of women on their tenured faculty actually decreased (5 departments), or remained the same (2 departments), despite the department growing.

4. Statistical Analysis

Statistical analysis of hiring, promotion and resignation patterns over the course of the study period was conducted by Professor Daniel Rabinowitz (Dept. of Statistics). Because these data were not directly available (with the exception of resignation), they had to be derived from changes and criteria associated with specific names in the raw catalogues provided by Arts and Sciences.

Statistical methods are outlined in the Appendix, along with the statistical test results. Estimates of regression coefficients and their associated p-values may be viewed as descriptive of the history of hiring, promotion, resignation, and retiring; to view estimates and p-values as statistical inferences about the culture of our institution would be predicated on the view that the experiences of individual faculty members are independent replications with common probabilistic properties. In other words, the statistical methods applied here are not necessarily appropriate for the type of dependent data examined, but are nevertheless useful in understanding the strength of apparent signals in the data.

Trends and observations are detailed below, with nominal statistical significance noted where present. Overall, despite the fact that these are small numbers, the results represent summaries of the history. Perceptions of greater hiring of men over women, perceptions of greater likelihood for women to resign at the tenured level, and for women being less likely to be put up for tenure are born out by a review of the data.

STATISTICAL RESULTS

Hiring – Untenured Faculty (Tenure-Track)

- Men were hired at greater rate than women among untenured (tenure-track) positions overall in Arts and Sciences (statistically significant). However, this does not account for the variability in the hiring pool.
- By divisions, there were slightly more men in Humanities, roughly equal numbers in Social Sciences, and vastly more in the Natural Sciences.

Hiring – Tenured Faculty

- Men were hired at a greater rate than women in the tenured ranks, with more extreme ratios than in the junior faculty hiring (statistically significant). Again, this does not account for the variability in the hiring pool.
- By division, vastly more men were hired in all divisions, with the Natural Sciences being the most extreme.

Hiring - Trends

- Overall, rates of hiring of women relative to men *decreased* with time, with the decrease more marked in non-tenured (statistically significant).
- By division, the trend is positive among the tenured natural scientists, but negative for all the non-tenured groups and tenured Social Sciences and Humanities.

Promotion to Tenure

- Women were less likely than their peers to be promoted (from untenured to tenured). This happened in all three reporting units, although the effects were negligible in Humanities and Natural Sciences, but substantial in the Social Sciences (statistically significant). Note: this happens before the cases reach university-level tenure review. At that step, 96% of women and 90% of men were tenured. Information was not available on why women left before this step.
- Overall the situation with respect to promotion seemed to improve for women over time, except in Social Sciences where the situation remained the same.

Resignations – Untenured Faculty (up to 5 years of service)

- Overall, women were less likely to resign from untenured positions (after adjusting for years of service), though this was not statistically significant. Note this does not include resignations immediately prior to going up for tenure, which are covered in promotion (above).
- By division, women were less likely to resign in Social Sciences (statistically significant) and Natural Sciences (barely significant), but more likely in the Humanities (not significant).
- Overall there were no significant trends over time with respect to untenured resignation, with no effect in Natural Sciences or Social Sciences, but perhaps likely more likely to resign overtime in Humanities.

Resignations – Tenured Faculty

- Overall, women were much more likely to resign from tenured positions.
- This trend was true across all divisions (Natural Sciences, Social Sciences and Humanities).
- Over time this trend was decreasing but with the change being almost entirely due to Natural Sciences.

5. Conclusions

PIPELINE TRENDS

1. While diversity in the tenured ranks at Columbia continues to improve overall, the rate of improvement does not appear to have changed significantly from the previous decade. At current rates it will take close to a century to reach parity in Natural Sciences, and about half a century in the Social Sciences, although Humanities is on track to be at parity in approximately a decade, assuming the recent stall is not maintained (see 3 below).
2. The representation of women in the non-tenured ranks has been decreasing in the last several years, and this decrease is particularly pronounced in the Natural Sciences. This could lead to a stall in progress at the tenured level. Overall there is a highly significant trend for hiring women at the untenured rank to be getting worse over time.
3. The number of tenured women in Humanities and Social Sciences appears to have stalled in the last 3-5 years of the study.
4. Women are more likely to be brought into the tenured ranks through promotion from untenured ranks than through hiring directly into the tenured ranks for Natural Sciences and Humanities, making the internal Columbia tenure-track pipeline particularly important for these divisions.

LINK OF DIVERSITY TO GROWTH AND FOCUSED ATTENTION

5. Focused gender diversity efforts, combined with a growth in the number of Arts and Sciences (A&S) faculty, in the ~2004-2008 time period appear to have been effective in increasing diversity in the tenure-track ranks. However, as growth decreased, or stalled altogether, and diversity efforts became broader and less focused on A&S, hiring patterns appear to have plateaued and in some cases reverted back to the original diversity level of a decade ago.
6. The decline in untenured ranks is led by the Natural Sciences, despite near parity in the graduate student body. The reasons for this are unknown, but it coincides with less focused attention on diversity within Natural Sciences as the scope of the Office of the Vice Provost for Diversity was broadened.
7. Overall, improvements in diversity appear to be closely tied to growth of A&S faculty, particularly at the tenured level, with the major improvements occurring when divisions were growing, and decreases or stalls occurring when growth was small or non-existent.

8. At the department level, in general, an increase in department size leads to an improvement in gender ratios. However, this varies significantly department by department, with some departments showing dramatic improvement, and a few decreasing in diversity despite increasing in size.

CLEAR LEAKS IN THE PIPELINE

9. Women in Social Sciences are significantly more likely to leave the untenured ranks immediately prior to going up for tenure than men.
10. Women are more likely than men to depart from tenured ranks, though it is not statistically significant. However, the lack of significance is at least in part because the pool is so small.
11. The recent drop in hiring of women at the untenured level is going to negatively impact progress at the tenured levels without focused efforts to hire more women at both the tenured and untenured ranks.

ISSUES TO ADDRESS MOVING FORWARD

12. Ultimately the responsibility for diverse and equitable hiring and promotion practices starts at the department level, with huge variability in growth of representation of women from department to department. Solutions need to be tailored to the issues facing specific departments from low pipelines to hiring practices. On a department scale, where women are significantly underrepresented on the faculty, they often (though not always) are also significantly underrepresented at the student level, suggesting a multi-level approach is needed. However, for most departments the pipeline is healthy at the graduate student level, and for many, it is healthy at the untenured level.
13. Departments within Arts and Sciences have not been particularly pro-active in accessing the most recently available diversity funds. This may in part be because communication about accessibility of these funds seems minimal at the department level, and confusion abounds.
14. Many of the conclusions of the first pipeline report still hold true, and many of the recommendations appear to remain unimplemented.
15. Conclusions and timeliness of this report were significantly hampered by lack of access to relevant data, and lack of staff to help assemble and analyze the data. This appears largely to be because data is not collected in a consistent and readily accessible fashion as recommended by the previous pipeline report.

6. Recommendations

DATA NEEDS

As per the prior Pipeline Report, the University needs to be much more systematic in collecting data so that less work needs to be put into extracting data, and more work can go into analyzing it. Additionally we recommend that more data be collected in terms of surveys within Arts and Sciences. We specifically recommend that:

1. The University increase the size of the Institutional Research Office. We have one of the smallest such offices in the Ivy League.
2. Arts and Sciences conduct an MIT-style survey of women's committee and teaching workload, offices, lab space, salary and other similar points of comparison relative to male colleagues. This should be led by tenured faculty.
3. Arts and Sciences conduct an initial and follow-up 'quality of life' web-based surveys, particularly targeting women faculty, both junior and senior, to try to establish why some groups are leaving at greater rate than their male colleagues, and to highlight aspects that may be working well.
4. Incorporate analysis of underrepresented minorities into the above surveys.

HIRING PRACTICES

Continued focus on diversity in hiring is essential to recover to the diversity of untenured hiring rates from the early to middle part of this survey period, and hopefully improve on the diversity of external hires into the tenure ranks. Specifically we recommend:

5. Special attention be paid to hiring in Natural Sciences and Social Sciences, keeping a close eye on the untenured pipeline, particularly in Natural Sciences, but also on the diversity of external hires to tenure in both divisions.
6. Appoint a tenured faculty member point-person within Arts and Sciences to track progress and help engage departments in diversity hiring opportunities.
7. Broaden dissemination of information on available resources for diversity hires so that everyone at the department level is engaged.
8. Improve flexibility in hires through diversity resources, including timing of funds and a broader scope of use of funds.

RETENTION AND RECRUITMENT

The disproportionate departure of women from the tenured ranks suggest that Arts and Sciences appears to be less successful at retaining women who receive outside offers, though no data is collected on this. Below we have recommendations that might help improve retention of women faculty, but should also help attract the outstanding women faculty that we are seeking to hire.

9. Recognize that a narrower band of the societally regarded 'acceptable' behavior for women makes it harder for them to negotiate competitive retention or hiring packages, and women often 'under-ask' relative to their male peers. Consider offering women more than they ask for, particularly if they 'under-ask' relative to recent comparable male hires or retentions.
10. Recognize that women may be less likely to seek outside offers specifically for salary raises, and since this is a primary tool used for obtaining higher salaries, this may lead to a *de facto* discriminatory salary policy.
11. Recognize that getting the best women may sometimes require making spousal hires, and that hiring male partners of women being retained or recruited should get the same priority as hiring female partners of male faculty being retained or recruited.
12. Ensure closer diversity oversight for hiring committees – in particular for departments that have fallen behind. Ensure [best practices](#) at every stage, including clear criteria for structuring search committees.
13. Recognize that diversity is best achieved in an environment of stable growth of faculty.

EXPANDING PIPELINE STUDIES

14. Finally, as highlighted in the previous pipeline report, we recommend that the university consider conducting, and making openly available, pipeline studies for other schools at Columbia, in particular schools where women are know to be underrepresented, such as the Engineering School and the Business School.

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8. Tables

List of Tables:

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*Notes:

1) The underrepresented minority data covers an additional year since it was collated at the very end of this study when the 2014-15 data had become available.

2) The total faculty numbers for divisions may be different for the same year in tables 2-4 (gender) versus tables 5-7 (underrepresented minority data). This reflects differences in the way that individuals are counted – e.g. some faculty have joint appointments in an A&S department and in a School outside of A&S (within Columbia). All such cases are included in the underrepresented minority data, but for the gender data these individuals were assigned to just one department on a case-by-case basis, and so some were not counted within A&S. Also the untenured faculty ranks may contain some faculty that Arts and Sciences considers off-track faculty, and thus are not contained in the gender data (see issue outlined in paragraph 2 of Section 2).

Table 1: Relative representation of women and men in Arts and Sciences at the undergraduate, graduate, tenure-track and tenured faculty levels from 2004-2013.

ARTS & SCIENCES (A&S)

Undergraduate Major and Concentrator Students										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	1226	1287	1241	1255	1338	1334	1382	1415	1382	1267
Men	1216	1199	1213	1226	1264	1209	1251	1332	1350	1312
Total	2442	2486	2454	2481	2602	2543	2633	2747	2732	2579
% Women	50%	52%	51%	51%	51%	52%	52%	52%	51%	49%

Graduate Students										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	984	984	965	961	902	845	829	835	818	800
Men	1109	1063	1008	1004	977	1067	991	1000	990	990
Total	2093	2047	1973	1965	1879	1912	1820	1835	1808	1790
% Women	47%	48%	49%	49%	48%	44%	46%	46%	45%	45%

Tenure-Eligible (Untenured) Faculty										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	51	59	66	74	73	70	67	65	55	48
Men	86	83	86	74	73	66	66	69	69	73
Total	137	142	152	148	146	136	133	134	124	121
% Women	37%	42%	43%	50%	50%	51%	50%	49%	44%	40%

Tenured Faculty										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	77	79	85	89	100	103	107	106	109	118
Men	274	279	280	285	293	299	292	299	301	305
Total	351	358	365	374	393	402	399	405	410	423
% Women	22%	22%	23%	24%	25%	26%	27%	26%	27%	28%

Table 2: Relative representation of women and men in Humanities at the undergraduate, graduate, tenure-track and tenured faculty levels from 2004-2013.

HUMANITIES

Undergraduate Major and Concentrator Students										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	480	513	461	412	433	444	465	462	421	387
Men	359	351	341	308	314	289	314	349	340	257
Total	839	864	802	720	747	733	779	811	761	644
% Women	57%	59%	57%	57%	58%	61%	60%	57%	55%	60%

Graduate Students										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	443	433	410	420	388	361	352	356	325	307
Men	371	355	337	327	333	322	332	333	311	321
Total	814	788	747	747	721	683	684	689	636	628
% Women	54%	55%	55%	56%	54%	53%	51%	52%	51%	49%

Tenure-Eligible (Untenured) Faculty										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	31	34	35	37	34	28	27	23	20	19
Men	33	33	33	30	27	24	24	24	22	21
Total	64	67	68	67	61	52	51	47	42	40
% Women	48%	51%	51%	55%	56%	54%	53%	49%	48%	48%

Tenured Faculty										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	39	40	43	45	51	53	55	55	55	57
Men	80	80	78	79	86	89	83	86	88	90
Total	119	120	121	124	137	142	138	141	143	147
% Women	33%	33%	36%	36%	37%	37%	40%	39%	38%	39%

Table 3: Relative representation of women and men in Natural Sciences at the undergraduate, graduate, tenure-track and tenured faculty levels from 2004-2013.

NATURAL SCIENCES

Undergraduate Major and Concentrator Students										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	287	298	294	329	372	368	384	450	505	424
Men	259	257	290	303	314	324	329	378	415	450
Total	546	555	584	632	686	692	713	828	920	874
% Women	53%	54%	50%	52%	54%	53%	54%	54%	55%	49%

Graduate Students										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	245	259	273	272	272	256	255	250	253	252
Men	386	368	349	353	340	358	371	367	369	366
Total	631	627	622	625	612	614	626	617	622	618
% Women	39%	41%	44%	44%	44%	42%	41%	41%	41%	41%

Tenure-Eligible (Untenured) Faculty										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	7	9	11	13	14	16	16	17	11	9
Men	27	25	29	27	27	24	24	26	27	31
Total	34	34	40	40	41	40	40	43	38	40
% Women	21%	26%	28%	33%	34%	40%	40%	40%	29%	23%

Tenured Faculty										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	16	15	16	17	19	19	20	21	24	30
Men	115	116	119	119	117	120	121	123	123	125
Total	131	131	135	136	136	139	141	144	147	155
% Women	12%	11%	12%	13%	14%	14%	14%	15%	16%	19%

Table 4: Relative representation of women and men in Social Sciences at the undergraduate, graduate, tenure-track and tenured faculty levels from 2004-2013.

SOCIAL SCIENCES

Undergraduate Major and Concentrator Students										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	459	476	486	514	533	522	533	503	456	456
Men	598	591	582	615	636	596	608	605	595	605
Total	1057	1067	1068	1129	1169	1118	1141	1108	1051	1061
% Women	43%	45%	46%	46%	46%	47%	47%	45%	43%	43%

Graduate Students										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	296	292	282	269	242	228	222	229	240	241
Men	352	340	322	324	304	387	288	300	310	303
Total	648	632	604	593	546	615	510	529	550	544
% Women	46%	46%	47%	45%	44%	37%	44%	43%	44%	44%

Tenure-Eligible (Untenured) Faculty										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	13	16	20	24	25	26	24	25	24	20
Men	26	25	24	17	19	18	18	19	20	21
Total	39	41	44	41	44	44	42	44	44	41
% Women	33%	39%	45%	59%	57%	59%	57%	57%	55%	49%

Tenured Faculty										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Women	22	24	26	27	30	31	32	30	30	31
Men	79	83	83	87	90	90	88	90	90	90
Total	101	107	109	114	120	121	120	120	120	121
% Women	22%	22%	24%	24%	25%	26%	27%	25%	25%	26%

Table 5: Representation of underrepresented Minorities in Humanities at the undergraduate, graduate, tenure-track and tenured faculty levels from 1990-2014.

Humanities 1992-2001										
Representation of Underrepresented Minorities: Students and Faculty										
Undergraduate Students										
	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Asian	94	72	87	94	83	84	72	72	73	62
Underrepresented Minority	67	67	68	85	86	78	77	104	108	105
Other	0	0	0	0	0	0	0	0	32	33
White	394	308	296	288	330	312	325	333	337	353
Unknown	31	20	54	74	64	68	87	92	60	58
Non-Resident Alien	13	7	9	16	19	17	13	10	14	19
TOTAL	598	472	514	556	581	559	573	610	623	630
TOTAL US/Perm. Residents	586	466	505	541	562	542	561	601	609	611
% Underrepresented Minority	11.4%	14.3%	13.5%	15.7%	15.2%	14.5%	13.7%	17.3%	17.7%	17.2%
Doctoral Students										
	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Asian	54	58	64	60	58	64	65	58	57	58
Underrepresented Minority	43	33	43	46	57	59	66	51	50	42
Other	3	3	6	9	9	12	16	19	20	20
White	843	808	759	738	712	687	683	635	594	560
Unknown	34	37	38	52	56	61	63	66	62	54
Non-Resident Alien	166	166	175	162	167	156	169	165	156	172
TOTAL	1143	1105	1085	1067	1059	1039	1062	994	939	906
TOTAL US/Perm. Residents	977	939	910	905	892	883	893	829	783	734
% Underrepresented Minority	4.4%	3.5%	4.7%	5.1%	6.4%	6.7%	7.4%	6.2%	6.4%	5.7%
Non-Tenured but on Track Faculty										
	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Asian	5	5	4	5	4	5	5	4	4	5
Underrepresented Minority	3	4	5	3	3	4	5	4	2	2
Undisclosed	0	0	0	0	0	0	0	0	0	0
White	71	68	66	61	55	51	44	47	49	46
TOTAL	79	77	75	69	62	60	54	55	55	53
% Underrepresented Minority	3.8%	5.2%	6.7%	4.3%	4.8%	6.7%	9.3%	7.3%	3.6%	3.8%
Tenured Faculty										
	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Asian	4	5	5	5	6	6	7	7	7	8
Underrepresented Minority	4	5	5	6	6	6	6	7	7	7
Undisclosed	0	0	0	0	0	0	0	0	0	0
White	96	102	97	99	105	101	106	106	105	103
TOTAL	104	112	107	110	117	113	119	120	119	118
% Underrepresented Minority	3.8%	4.5%	4.7%	5.5%	5.1%	5.3%	5.0%	5.8%	5.9%	5.9%

-Sources: Student Information Systems (student data); Office of the Vice Provost for Academic Administration (faculty data)

-Student enrollment counts include part-time degree-seeking students and students in dual degree programs

-All doctoral students are included (PhD, DES, DrPH, etc)

-Enrollment as of end of term

-For students, minority percentages exclude non-resident aliens

-US/Perm. Residents - US Citizens and Permanent Residents

-Tenured Faculty: Professors and Associate Professors with Tenure

-Non-Tenured but on Track: Professors, Associate Professors, and Assistant Professors, who are not tenured but are eligible for tenure.

-Faculty numbers exclude Clinical (both prefix and suffix) Professors, Professors of Professional Practice, Visiting Professors, Instructors, and Lecturers

-Faculty numbers include a few non-resident aliens

-Tenured and tenure-track faculty members who also hold full-time administrative positions were not included in faculty numbers prior to 2009

-Underrepresented Minority includes any faculty member or student who self-identifies as Black, Hispanic, American Indian/Alaskan Native

and/or Native Hawaiian/Pacific Islander

-Important Note: In 2010, there were changes in federal requirements concerning the collection and reporting of race and ethnicity information

Table 5 (continued)

**Humanities 2002-2011
Representation of Underrepresented Minorities: Students and Faculty**

Undergraduate Students

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Asian	57	60	59	68	63	63	64	55	72	60
Underrepresented Minority	99	116	118	109	109	110	127	122	139	173
Other	33	32	28	36	43	31	20	18	n/a	n/a
White	384	385	392	398	358	305	304	268	267	286
Unknown	64	67	65	78	75	58	50	50	49	39
Non-Resident Alien	<u>23</u>	<u>31</u>	<u>31</u>	<u>25</u>	<u>23</u>	<u>15</u>	<u>20</u>	<u>31</u>	<u>40</u>	<u>41</u>
TOTAL	660	691	693	714	670	581	584	543	567	600
TOTAL US/Perm. Residents	637	660	662	689	646	566	565	512	528	559
% Underrepresented Minority	15.5%	17.6%	17.9%	15.8%	16.8%	19.4%	22.5%	23.8%	26.4%	31.0%

Doctoral Students

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Asian	55	53	49	48	44	49	44	45	50	51
Underrepresented Minority	44	37	41	43	45	43	47	46	54	59
Other	22	25	25	28	32	35	34	32	n/a	n/a
White	522	490	455	419	379	359	319	299	322	312
Unknown	54	59	70	76	75	85	86	80	67	66
Non-Resident Alien	<u>167</u>	<u>176</u>	<u>174</u>	<u>174</u>	<u>172</u>	<u>176</u>	<u>191</u>	<u>181</u>	<u>191</u>	<u>201</u>
TOTAL	864	840	814	788	747	747	721	683	684	689
TOTAL US/Perm. Residents	697	664	640	614	575	571	530	502	493	488
% Underrepresented Minority	6.3%	5.6%	6.4%	7.0%	7.8%	7.5%	8.9%	9.2%	11.0%	12.1%

Non-Tenured but on Track Faculty

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Asian	8	5	6	5	5	8	7	6	7	5
Underrepresented Minority	1	3	3	3	4	4	3	3	4	4
Undisclosed	0	0	0	0	0	0	0	0	0	0
White	<u>53</u>	<u>62</u>	<u>64</u>	<u>67</u>	<u>67</u>	<u>73</u>	<u>66</u>	<u>52</u>	<u>47</u>	<u>45</u>
TOTAL	62	70	73	75	76	85	76	61	58	54
% Underrepresented Minority	1.6%	4.3%	4.1%	4.0%	5.3%	4.7%	3.9%	4.9%	6.9%	7.4%

Tenured Faculty

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Asian	9	11	9	8	11	12	12	13	13	13
Underrepresented Minority	6	6	7	7	8	11	13	15	14	14
Undisclosed	0	0	0	0	0	0	0	0	0	0
White	<u>103</u>	<u>101</u>	<u>98</u>	<u>99</u>	<u>93</u>	<u>97</u>	<u>106</u>	<u>113</u>	<u>108</u>	<u>113</u>
TOTAL	118	118	114	114	112	120	131	141	135	140
% Underrepresented Minority	5.1%	5.1%	6.1%	6.1%	7.1%	9.2%	9.9%	10.6%	10.4%	10.0%

-Sources: Student Information Systems (student data); Office of the Vice Provost for Academic Administration (faculty data)

-Student enrollment counts include part-time degree-seeking students and students in dual degree programs

-All doctoral students are included (PhD, DES, DrPH, etc)

-Enrollment as of end of term

-For students, minority percentages exclude non-resident aliens

-US/Perm. Residents - US Citizens and Permanent Residents

-Tenured Faculty: Professors and Associate Professors with Tenure

-Non-Tenured but on Track: Professors, Associate Professors, and Assistant Professors, who are not tenured but are eligible for tenure.

-Faculty numbers exclude Clinical (both prefix and suffix) Professors, Professors of Professional Practice, Visiting Professors, Instructors, and Lecturers

-Faculty numbers include a few non-resident aliens

-Tenured and tenure-track faculty members who also hold full-time administrative positions were not included in faculty numbers prior to 2009

-Underrepresented Minority includes any faculty member or student who self-identifies as Black, Hispanic, American Indian/Alaskan Native and/or Native Hawaiian/Pacific Islander

-Important Note: In 2010, there were changes in federal requirements concerning the collection and reporting of race and ethnicity information

Table 5 (continued)

**Humanities 2005-2014
Representation of Underrepresented Minorities: Students and Faculty**

Undergraduate Students

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Asian	68	63	63	64	55	72	60	48	60	62
Underrepresented Minority	109	109	110	127	122	139	173	177	157	160
Other	36	43	31	20	18	n/a	n/a	n/a	n/a	n/a
White	398	358	305	304	268	267	286	274	217	204
Unknown	78	75	58	50	50	49	39	27	25	23
Non-Resident Alien	<u>25</u>	<u>23</u>	<u>15</u>	<u>20</u>	<u>31</u>	<u>40</u>	<u>41</u>	<u>41</u>	<u>38</u>	<u>37</u>
TOTAL	714	670	581	584	543	567	600	566	498	485
TOTAL US/Perm. Residents	689	646	566	565	512	528	559	525	460	448
% Underrepresented Minority	15.8%	16.8%	19.4%	22.5%	23.8%	26.4%	31.0%	33.6%	34.2%	35.7%

Doctoral Students

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Asian	48	44	49	44	45	50	51	54	49	53
Underrepresented Minority	43	45	43	47	46	54	59	57	54	53
Other	28	32	35	34	32	n/a	n/a	n/a	n/a	n/a
White	419	379	359	319	299	322	312	311	297	286
Unknown	76	75	85	86	80	67	66	57	61	58
Non-Resident Alien	<u>174</u>	<u>172</u>	<u>176</u>	<u>191</u>	<u>181</u>	<u>191</u>	<u>201</u>	<u>193</u>	<u>198</u>	<u>212</u>
TOTAL	788	747	747	721	683	684	689	672	659	662
TOTAL US/Perm. Residents	614	575	571	530	502	493	488	479	461	450
% Underrepresented Minority	7.0%	7.8%	7.5%	8.9%	9.2%	11.0%	12.1%	11.9%	11.7%	11.8%

Non-Tenured but on Track Faculty

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Asian	5	5	8	7	6	7	5	4	4	4
Underrepresented Minority	3	4	4	3	3	4	4	5	5	4
Undisclosed	0	0	0	0	0	0	0	1	4	7
White	<u>67</u>	<u>67</u>	<u>73</u>	<u>66</u>	<u>52</u>	<u>47</u>	<u>45</u>	<u>43</u>	<u>38</u>	<u>29</u>
TOTAL	75	76	85	76	61	58	54	53	51	44
% Underrepresented Minority	4.0%	5.3%	4.7%	3.9%	4.9%	6.9%	7.4%	9.4%	9.8%	9.1%

Tenured Faculty

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Asian	8	11	12	12	13	13	13	13	13	13
Underrepresented Minority	7	8	11	13	15	14	14	14	15	16
Undisclosed	0	0	0	0	0	0	0	1	2	3
White	<u>99</u>	<u>93</u>	<u>97</u>	<u>106</u>	<u>113</u>	<u>108</u>	<u>113</u>	<u>114</u>	<u>117</u>	<u>118</u>
TOTAL	114	112	120	131	141	135	140	142	147	150
% Underrepresented Minority	6.1%	7.1%	9.2%	9.9%	10.6%	10.4%	10.0%	9.9%	10.2%	10.7%

-Sources: Student Information Systems (student data); Office of the Vice Provost for Academic Administration (faculty data)

-Student enrollment counts include part-time degree-seeking students and students in dual degree programs

-All doctoral students are included (PhD, DES, DrPH, etc)

-Enrollment as of end of term

-For students, minority percentages exclude non-resident aliens

-US/Perm. Residents - US Citizens and Permanent Residents

-Tenured Faculty: Professors and Associate Professors with Tenure

-Non-Tenured but on Track: Professors, Associate Professors, and Assistant Professors, who are not tenured but are eligible for tenure.

-Faculty numbers exclude Clinical (both prefix and suffix) Professors, Professors of Professional Practice, Visiting Professors, Instructors, and Lecturers

-Faculty numbers include a few non-resident aliens

-Tenured and tenure-track faculty members who also hold full-time administrative positions were not included in faculty numbers prior to 2009

-Underrepresented Minority includes any faculty member or student who self-identifies as Black, Hispanic, American Indian/Alaskan Native

and/or Native Hawaiian/Pacific Islander

-Important Note: In 2010, there were changes in federal requirements concerning the collection and reporting of race and ethnicity information

Table 6: Representation of underrepresented Minorities in Natural Sciences at the undergraduate, graduate, tenure-track and tenured faculty levels from 1990-2014.

Natural Sciences 1992-2001
Representation of Underrepresented Minorities: Students and Faculty

Undergraduate Students

	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Asian	69	62	83	91	96	86	78	75	74	70
Underrepresented Minority	66	62	59	44	48	54	60	58	54	61
Other	0	0	0	0	0	0	0	0	20	18
White	185	136	138	149	148	170	179	189	200	190
Unknown	5	4	14	23	34	37	42	43	29	38
Non-Resident Alien	8	7	5	9	12	12	15	12	12	11
TOTAL	333	271	298	317	338	360	375	376	389	387
TOTAL US/Perm. Residents	325	264	293	308	326	348	360	364	377	376
% Underrepresented Minority	20.3%	23.5%	20.0%	14.4%	14.7%	15.6%	16.8%	15.8%	14.3%	16.1%

Doctoral Students

	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Asian	52	50	45	35	34	28	23	25	25	23
Underrepresented Minority	8	12	12	6	8	11	10	12	13	12
Other	0	3	3	5	4	6	7	10	10	10
White	192	196	183	169	174	172	181	191	203	224
Unknown	5	15	18	19	20	23	20	23	21	19
Non-Resident Alien	<u>254</u>	<u>257</u>	<u>263</u>	<u>252</u>	<u>227</u>	<u>224</u>	<u>225</u>	<u>222</u>	<u>240</u>	<u>255</u>
TOTAL	511	533	524	486	467	464	466	483	512	543
TOTAL US/Perm. Residents	257	276	261	234	240	240	241	261	272	288
% Underrepresented Minority	3.1%	4.3%	4.6%	2.6%	3.3%	4.6%	4.1%	4.6%	4.8%	4.2%

Non-Tenured but on Track Faculty

	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Asian	7	10	10	8	8	15	12	13	11	14
Underrepresented Minority	1	1	0	0	1	0	2	2	4	4
Undisclosed	0	0	0	0	0	0	0	0	0	0
White	<u>44</u>	<u>45</u>	<u>43</u>	<u>38</u>	<u>45</u>	<u>47</u>	<u>44</u>	<u>48</u>	<u>56</u>	<u>59</u>
TOTAL	52	56	53	46	54	62	58	63	71	77
% Underrepresented Minority	1.9%	1.8%	0.0%	0.0%	1.9%	0.0%	3.4%	3.2%	5.6%	5.2%

Tenured Faculty

	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Asian	9	8	8	8	8	8	7	7	9	10
Underrepresented Minority	1	0	1	1	1	1	1	1	1	1
Undisclosed	0	0	0	0	0	0	0	0	0	0
White	<u>85</u>	<u>83</u>	<u>80</u>	<u>85</u>	<u>91</u>	<u>95</u>	<u>100</u>	<u>98</u>	<u>103</u>	<u>106</u>
TOTAL	95	91	89	94	100	104	108	106	113	117
% Underrepresented Minority	1.1%	0.0%	1.1%	1.1%	1.0%	1.0%	0.9%	0.9%	0.9%	0.9%

-Sources: Student Information Systems (student data); Office of the Vice Provost for Academic Administration (faculty data)

-Student enrollment counts include part-time degree-seeking students and students in dual degree programs

-All doctoral students are included (PhD, DES, DrPH, etc)

-Enrollment as of end of term

-For students, minority percentages exclude non-resident aliens

-US/Perm. Residents - US Citizens and Permanent Residents

-Tenured Faculty: Professors and Associate Professors with Tenure

-Non-Tenured but on Track: Professors, Associate Professors, and Assistant Professors, who are not tenured but are eligible for tenure.

-Faculty numbers exclude Clinical (both prefix and suffix) Professors, Professors of Professional Practice, Visiting Professors, Instructors, and Lecturers

-Faculty numbers include a few non-resident aliens

-Tenured and tenure-track faculty members who also hold full-time administrative positions were not included in faculty numbers prior to 2009

-Underrepresented Minority includes any faculty member or student who self-identifies as Black, Hispanic, American Indian/Alaskan Native

and/or Native Hawaiian/Pacific Islander

-Important Note: In 2010, there were changes in federal requirements concerning the collection and reporting of race and ethnicity information

Table 6 (continued)

Natural Sciences 2002-2011
Representation of Underrepresented Minorities: Students and Faculty

Undergraduate Students

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Asian	64	70	84	86	77	102	108	98	101	122
Underrepresented Minority	52	46	53	62	82	95	110	108	111	160
Other	19	15	15	25	20	28	27	20	n/a	n/a
White	184	212	192	183	189	175	188	184	224	283
Unknown	38	37	39	38	41	36	41	55	34	26
Non-Resident Alien	<u>11</u>	<u>11</u>	<u>13</u>	<u>18</u>	<u>28</u>	<u>35</u>	<u>39</u>	<u>42</u>	<u>45</u>	<u>55</u>
TOTAL	367	391	396	412	437	472	512	507	515	645
TOTAL US/Perm. Residents	357	379	383	394	409	436	473	465	470	589
% Underrepresented Minority	14.5%	12.1%	13.8%	15.7%	20.0%	21.8%	23.2%	23.3%	23.5%	27.1%

Doctoral Students

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Asian	25	24	28	30	28	32	30	26	39	42
Underrepresented Minority	15	15	26	26	24	23	26	30	34	41
Other	10	11	11	11	13	12	6	6	n/a	n/a
White	232	236	244	243	238	245	243	262	272	261
Unknown	29	39	49	53	54	46	44	40	31	28
Non-Resident Alien	<u>272</u>	<u>280</u>	<u>273</u>	<u>264</u>	<u>265</u>	<u>267</u>	<u>263</u>	<u>250</u>	<u>250</u>	<u>245</u>
TOTAL	583	605	631	627	622	625	612	614	626	617
TOTAL US/Perm. Residents	311	325	358	363	357	358	349	364	376	372
% Underrepresented Minority	4.8%	4.6%	7.3%	7.2%	6.7%	6.4%	7.4%	8.2%	9.0%	11.0%

Non-Tenured but on Track Faculty

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Asian	17	16	10	9	10	9	11	12	16	20
Underrepresented Minority	4	3	4	6	6	6	5	5	8	9
Undisclosed	0	0	0	0	0	0	0	0	0	0
White	<u>51</u>	<u>46</u>	<u>42</u>	<u>36</u>	<u>39</u>	<u>45</u>	<u>45</u>	<u>46</u>	<u>42</u>	<u>42</u>
TOTAL	72	65	56	51	55	60	61	63	66	71
% Underrepresented Minority	5.6%	4.6%	7.1%	11.8%	10.9%	10.0%	8.2%	7.9%	12.1%	12.7%

Tenured Faculty

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Asian	10	11	12	12	12	12	13	13	13	13
Underrepresented Minority	2	3	3	3	3	3	3	5	4	3
Undisclosed	0	0	0	0	0	0	0	0	1	1
White	<u>109</u>	<u>111</u>	<u>115</u>	<u>113</u>	<u>118</u>	<u>119</u>	<u>118</u>	<u>122</u>	<u>122</u>	<u>126</u>
TOTAL	121	125	130	128	133	134	134	140	140	143
% Underrepresented Minority	1.7%	2.4%	2.3%	2.3%	2.3%	2.2%	2.2%	3.6%	2.9%	2.1%

-Sources: Student Information Systems (student data); Office of the Vice Provost for Academic Administration (faculty data)

-Student enrollment counts include part-time degree-seeking students and students in dual degree programs

-All doctoral students are included (PhD, DES, DrPH, etc)

-Enrollment as of end of term

-For students, minority percentages exclude non-resident aliens

-US/Perm. Residents - US Citizens and Permanent Residents

-Tenured Faculty: Professors and Associate Professors with Tenure

-Non-Tenured but on Track: Professors, Associate Professors, and Assistant Professors, who are not tenured but are eligible for tenure.

-Faculty numbers exclude Clinical (both prefix and suffix) Professors, Professors of Professional Practice, Visiting Professors, Instructors, and Lecturers

-Faculty numbers include a few non-resident aliens

-Tenured and tenure-track faculty members who also hold full-time administrative positions were not included in faculty numbers prior to 2009

-Underrepresented Minority includes any faculty member or student who self-identifies as Black, Hispanic, American Indian/Alaskan Native

and/or Native Hawaiian/Pacific Islander

-Important Note: In 2010, there were changes in federal requirements concerning the collection and reporting of race and ethnicity information

Table 6 (continued)

Natural Sciences 2005-2014
Representation of Underrepresented Minorities: Students and Faculty

Undergraduate Students

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Asian	86	77	102	108	98	101	122	146	151	156
Underrepresented Minority	62	82	95	110	108	111	160	201	178	178
Other	25	20	28	27	20	n/a	n/a	n/a	n/a	n/a
White	183	189	175	188	184	224	283	287	261	263
Unknown	38	41	36	41	55	34	26	20	22	16
Non-Resident Alien	<u>18</u>	<u>28</u>	<u>35</u>	<u>39</u>	<u>42</u>	<u>45</u>	<u>55</u>	<u>62</u>	<u>68</u>	<u>74</u>
TOTAL	412	437	472	512	507	515	645	716	679	686
TOTAL US/Perm. Residents	394	409	436	473	465	470	589	653	612	612
% Underrepresented Minority	15.7%	20.0%	21.8%	23.2%	23.3%	23.5%	27.1%	30.7%	29.0%	29.0%

Doctoral Students

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Asian	30	28	32	30	26	39	42	50	50	52
Underrepresented Minority	26	24	23	26	30	34	41	45	45	46
Other	11	13	12	6	6	n/a	n/a	n/a	n/a	n/a
White	243	238	245	243	262	272	261	247	241	232
Unknown	53	54	46	44	40	31	28	31	31	35
Non-Resident Alien	<u>264</u>	<u>265</u>	<u>267</u>	<u>263</u>	<u>250</u>	<u>250</u>	<u>245</u>	<u>249</u>	<u>251</u>	<u>256</u>
TOTAL	627	622	625	612	614	626	617	622	618	621
TOTAL US/Perm. Residents	363	357	358	349	364	376	372	373	367	365
% Underrepresented Minority	7.2%	6.7%	6.4%	7.4%	8.2%	9.0%	11.0%	12.1%	12.3%	12.6%

Non-Tenured but on Track Faculty

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Asian	9	10	9	11	12	16	20	19	20	16
Underrepresented Minority	6	6	6	5	5	8	9	5	6	7
Undisclosed	0	0	0	0	0	0	0	1	3	2
White	<u>36</u>	<u>39</u>	<u>45</u>	<u>45</u>	<u>46</u>	<u>42</u>	<u>42</u>	<u>42</u>	<u>42</u>	<u>37</u>
TOTAL	51	55	60	61	63	66	71	67	71	62
% Underrepresented Minority	11.8%	10.9%	10.0%	8.2%	7.9%	12.1%	12.7%	7.5%	8.5%	11.3%

Tenured Faculty

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Asian	12	12	12	13	13	13	13	14	14	15
Underrepresented Minority	3	3	3	3	5	4	3	6	6	6
Undisclosed	0	0	0	0	0	1	1	1	1	2
White	<u>113</u>	<u>118</u>	<u>119</u>	<u>118</u>	<u>122</u>	<u>122</u>	<u>126</u>	<u>127</u>	<u>134</u>	<u>139</u>
TOTAL	128	133	134	134	140	140	143	148	155	162
% Underrepresented Minority	2.3%	2.3%	2.2%	2.2%	3.6%	2.9%	2.1%	4.1%	3.9%	3.7%

-Sources: Student Information Systems (student data); Office of the Vice Provost for Academic Administration (faculty data)

-Student enrollment counts include part-time degree-seeking students and students in dual degree programs

-All doctoral students are included (PhD, DES, DrPH, etc)

-Enrollment as of end of term

-For students, minority percentages exclude non-resident aliens

-US/Perm. Residents - US Citizens and Permanent Residents

-Tenured Faculty: Professors and Associate Professors with Tenure

-Non-Tenured but on Track: Professors, Associate Professors, and Assistant Professors, who are not tenured but are eligible for tenure.

-Faculty numbers exclude Clinical (both prefix and suffix) Professors, Professors of Professional Practice, Visiting Professors, Instructors, and Lecturers

-Faculty numbers include a few non-resident aliens

-Tenured and tenure-track faculty members who also hold full-time administrative positions were not included in faculty numbers prior to 2009

-Underrepresented Minority includes any faculty member or student who self-identifies as Black, Hispanic, American Indian/Alaskan Native and/or Native Hawaiian/Pacific Islander

-Important Note: In 2010, there were changes in federal requirements concerning the collection and reporting of race and ethnicity information

Table 7: Representation of underrepresented Minorities in Social Sciences at the undergraduate, graduate, tenure-track and tenured faculty levels from 1990-2014.

Social Sciences 1992-2001
Representation of Underrepresented Minorities: Students and Faculty

Undergraduate Students

	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Asian	131	119	143	146	134	126	131	114	115	109
Underrepresented Minority	176	150	154	126	139	119	126	156	142	127
Other	0	0	0	0	0	0	0	0	42	47
White	532	399	369	363	393	365	345	390	381	383
Unknown	26	13	48	66	72	71	72	84	58	67
Non-Resident Alien	<u>25</u>	<u>25</u>	<u>31</u>	<u>34</u>	<u>32</u>	<u>37</u>	<u>32</u>	<u>31</u>	<u>36</u>	<u>43</u>
TOTAL	889	706	745	734	771	717	706	776	774	776
TOTAL US/Perm. Residents	865	681	714	701	738	680	674	745	738	733
% Underrepresented Minority	20.4%	22.1%	21.6%	18.0%	18.8%	17.4%	18.7%	20.9%	19.3%	17.4%

Doctoral Students

	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Asian	61	61	63	56	59	59	53	52	48	43
Underrepresented Minority	52	54	57	61	60	59	59	53	48	47
Other	2	4	5	7	9	9	12	14	22	24
White	627	586	576	560	525	496	474	445	395	362
Unknown	19	29	39	50	55	59	53	55	48	41
Non-Resident Alien	<u>254</u>	<u>254</u>	<u>246</u>	<u>241</u>	<u>237</u>	<u>252</u>	<u>278</u>	<u>275</u>	<u>273</u>	<u>269</u>
TOTAL	1015	988	986	975	945	934	929	894	834	786
TOTAL US/Perm. Residents	761	734	740	734	708	682	651	619	561	517
% Underrepresented Minority	6.8%	7.4%	7.7%	8.3%	8.5%	8.7%	9.1%	8.6%	8.6%	9.1%

Non-Tenured but on Track Faculty

	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Asian	5	7	5	5	5	3	5	7	9	9
Underrepresented Minority	3	4	5	5	3	5	6	7	6	5
Undisclosed	0	0	0	0	0	0	0	0	0	0
White	46	49	46	39	38	39	33	29	31	28
TOTAL	54	60	56	49	46	47	44	43	46	42
% Underrepresented Minority	5.6%	6.7%	8.9%	10.2%	6.5%	10.6%	13.6%	16.3%	13.0%	11.9%

Tenured Faculty

	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Asian	3	3	5	5	6	6	6	7	6	6
Underrepresented Minority	5	6	6	6	7	6	6	5	4	6
Undisclosed	0	0	0	0	0	0	0	0	0	0
White	<u>75</u>	<u>74</u>	<u>75</u>	<u>75</u>	<u>72</u>	<u>70</u>	<u>79</u>	<u>85</u>	<u>88</u>	<u>78</u>
TOTAL	83	83	86	86	85	82	91	97	98	90
% Underrepresented Minority	6.0%	7.2%	7.0%	7.0%	8.2%	7.3%	6.6%	5.2%	4.1%	6.7%

-Sources: Student Information Systems (student data); Office of the Vice Provost for Academic Administration (faculty data)

-Student enrollment counts include part-time degree-seeking students and students in dual degree programs

-All doctoral students are included (PhD, DES, DrPH, etc)

-Enrollment as of end of term

-For students, minority percentages exclude non-resident aliens

-US/Perm. Residents - US Citizens and Permanent Residents

-Tenured Faculty: Professors and Associate Professors with Tenure

-Non-Tenured but on Track: Professors, Associate Professors, and Assistant Professors, who are not tenured but are eligible for tenure.

-Faculty numbers exclude Clinical (both prefix and suffix) Professors, Professors of Professional Practice, Visiting Professors, Instructors, and Lecturers

-Faculty numbers include a few non-resident aliens

-Tenured and tenure-track faculty members who also hold full-time administrative positions were not included in faculty numbers prior to 2009

-Underrepresented Minority includes any faculty member or student who self-identifies as Black, Hispanic, American Indian/Alaskan Native and/or Native Hawaiian/Pacific Islander

-Important Note: In 2010, there were changes in federal requirements concerning the collection and reporting of race and ethnicity information

Table 7 (continued)

**Social Sciences 2002-2011
Representation of Underrepresented Minorities: Students and Faculty**

Undergraduate Students

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Asian	108	99	83	101	107	94	100	112	121	112
Underrepresented Minority	139	141	136	141	143	158	195	208	199	203
Other	40	23	25	34	36	33	33	30	n/a	n/a
White	407	419	412	388	382	417	383	309	316	315
Unknown	76	67	59	67	72	71	60	63	62	35
Non-Resident Alien	59	59	58	56	49	51	65	81	94	97
TOTAL	829	808	774	787	789	823	835	802	791	762
TOTAL US/Perm. Residents	770	749	715	732	739	773	770	721	697	665
% Underrepresented Minority	18.0%	18.8%	19.1%	19.3%	19.3%	20.5%	25.3%	28.8%	28.5%	30.6%

Doctoral Students

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Asian	43	35	34	33	32	34	32	30	30	29
Underrepresented Minority	45	45	42	43	42	42	32	35	38	42
Other	18	18	21	21	24	25	22	20	n/a	n/a
White	325	302	273	251	228	215	184	172	178	184
Unknown	36	33	35	40	39	32	38	36	40	39
Non-Resident Alien	273	261	243	244	239	245	238	222	224	235
TOTAL	740	694	648	632	604	593	546	515	510	529
TOTAL US/Perm. Residents	467	433	405	388	365	348	308	293	286	294
% Underrepresented Minority	9.6%	10.4%	10.4%	11.1%	11.5%	12.1%	10.4%	11.9%	13.3%	14.3%

Non-Tenured but on Track Faculty

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Asian	10	9	6	8	8	5	5	5	4	5
Underrepresented Minority	5	5	4	3	6	4	8	9	8	8
Undisclosed	0	0	0	0	0	0	0	0	1	1
White	29	34	35	33	38	33	35	31	32	35
TOTAL	44	48	45	44	52	42	48	45	45	49
% Underrepresented Minority	11.4%	10.4%	8.9%	6.8%	11.5%	9.5%	16.7%	20.0%	17.8%	16.3%

Tenured Faculty

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Asian	7	7	9	10	11	12	13	15	17	17
Underrepresented Minority	6	7	8	9	8	8	13	13	12	11
Undisclosed	0	0	0	0	0	0	0	0	0	1
White	78	80	79	85	86	90	89	94	91	93
TOTAL	91	94	96	104	105	110	115	122	120	122
% Underrepresented Minority	6.6%	7.4%	8.3%	8.7%	7.6%	7.3%	11.3%	10.7%	10.0%	9.0%

-Sources: Student Information Systems (student data); Office of the Vice Provost for Academic Administration (faculty data)

-Student enrollment counts include part-time degree-seeking students and students in dual degree programs

-All doctoral students are included (PhD, DES, DrPH, etc)

-Enrollment as of end of term

-For students, minority percentages exclude non-resident aliens

-US/Perm. Residents - US Citizens and Permanent Residents

-Tenured Faculty: Professors and Associate Professors with Tenure

-Non-Tenured but on Track: Professors, Associate Professors, and Assistant Professors, who are not tenured but are eligible for tenure.

-Faculty numbers exclude Clinical (both prefix and suffix) Professors, Professors of Professional Practice, Visiting Professors, Instructors, and Lecturers

-Faculty numbers include a few non-resident aliens

-Tenured and tenure-track faculty members who also hold full-time administrative positions were not included in faculty numbers prior to 2009

-Underrepresented Minority includes any faculty member or student who self-identifies as Black, Hispanic, American Indian/Alaskan Native and/or Native Hawaiian/Pacific Islander

-Important Note: In 2010, there were changes in federal requirements concerning the collection and reporting of race and ethnicity information

Table 7 (continued)

**Social Sciences 2005-2014
Representation of Underrepresented Minorities: Students and Faculty**

Undergraduate Students

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Asian	101	107	94	100	112	121	112	108	132	136
Underrepresented Minority	141	143	158	195	208	199	203	211	191	195
Other	34	36	33	33	30	n/a	n/a	n/a	n/a	n/a
White	388	382	417	383	309	316	315	287	279	276
Unknown	67	72	71	60	63	62	35	25	32	19
Non-Resident Alien	<u>56</u>	<u>49</u>	<u>51</u>	<u>65</u>	<u>81</u>	<u>94</u>	<u>97</u>	<u>90</u>	<u>94</u>	<u>94</u>
TOTAL	787	789	823	835	802	791	762	721	728	721
TOTAL US/Perm. Residents	732	739	773	770	721	697	665	631	634	627
% Underrepresented Minority	19.3%	19.3%	20.5%	25.3%	28.8%	28.5%	30.6%	33.5%	30.1%	31.1%

Doctoral Students

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Asian	33	32	34	32	30	30	29	31	32	32
Underrepresented Minority	43	42	42	32	35	38	42	43	46	52
Other	21	24	25	22	20	n/a	n/a	n/a	n/a	n/a
White	251	228	215	184	172	178	184	190	187	178
Unknown	40	39	32	38	36	40	39	38	42	41
Non-Resident Alien	<u>244</u>	<u>239</u>	<u>245</u>	<u>238</u>	<u>222</u>	<u>224</u>	<u>235</u>	<u>248</u>	<u>237</u>	<u>230</u>
TOTAL	632	604	593	546	515	510	529	550	544	533
TOTAL US/Perm. Residents	388	365	348	308	293	286	294	302	307	303
% Underrepresented Minority	11.1%	11.5%	12.1%	10.4%	11.9%	13.3%	14.3%	14.2%	15.0%	17.2%

Non-Tenured but on Track Faculty

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Asian	8	8	5	5	5	4	5	6	6	5
Underrepresented Minority	3	6	4	8	9	8	8	9	8	6
Undisclosed	0	0	0	0	0	1	1	1	2	2
White	<u>33</u>	<u>38</u>	<u>33</u>	<u>35</u>	<u>31</u>	<u>32</u>	<u>35</u>	<u>33</u>	<u>29</u>	<u>27</u>
TOTAL	44	52	42	48	45	45	49	49	45	40
% Underrepresented Minority	6.8%	11.5%	9.5%	16.7%	20.0%	17.8%	16.3%	18.4%	17.8%	15.0%

Tenured Faculty

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Asian	10	11	12	13	15	17	17	16	15	15
Underrepresented Minority	9	8	8	13	13	12	11	11	11	11
Undisclosed	0	0	0	0	0	0	1	1	1	2
White	<u>85</u>	<u>86</u>	<u>90</u>	<u>89</u>	<u>94</u>	<u>91</u>	<u>93</u>	<u>92</u>	<u>95</u>	<u>96</u>
TOTAL	104	105	110	115	122	120	122	120	122	124
% Underrepresented Minority	8.7%	7.6%	7.3%	11.3%	10.7%	10.0%	9.0%	9.2%	9.0%	8.9%

-Sources: Student Information Systems (student data); Office of the Vice Provost for Academic Administration (faculty data)

-Student enrollment counts include part-time degree-seeking students and students in dual degree programs

-All doctoral students are included (PhD, DES, DrPH, etc)

-Enrollment as of end of term

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and/or Native Hawaiian/Pacific Islander

-Important Note: In 2010, there were changes in federal requirements concerning the collection and reporting of race and ethnicity information

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List of Most & Least Improved Departments.

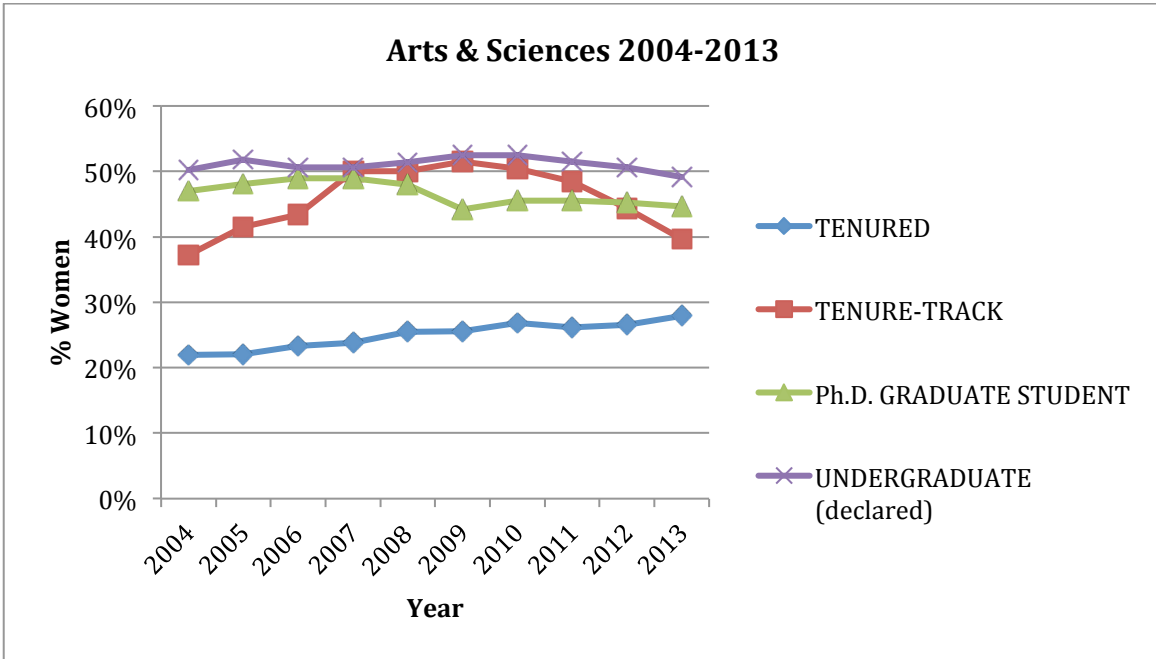


Figure 1: Overall Arts and Sciences % women for undergraduate students (with declared majors or concentrations), graduate students, tenure-track (untentured) and tenured faculty from 2004-2013.

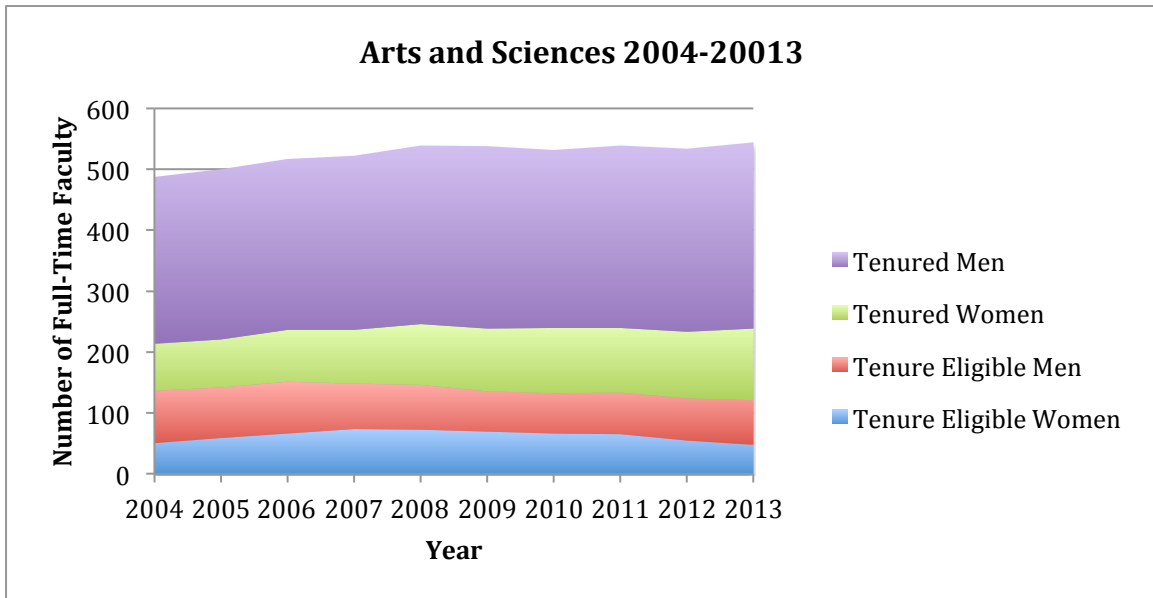


Figure 2: Overall Arts and Sciences Numbers of Men and Women tenure-track (untentured) and tenured faculty from 2004-2013.

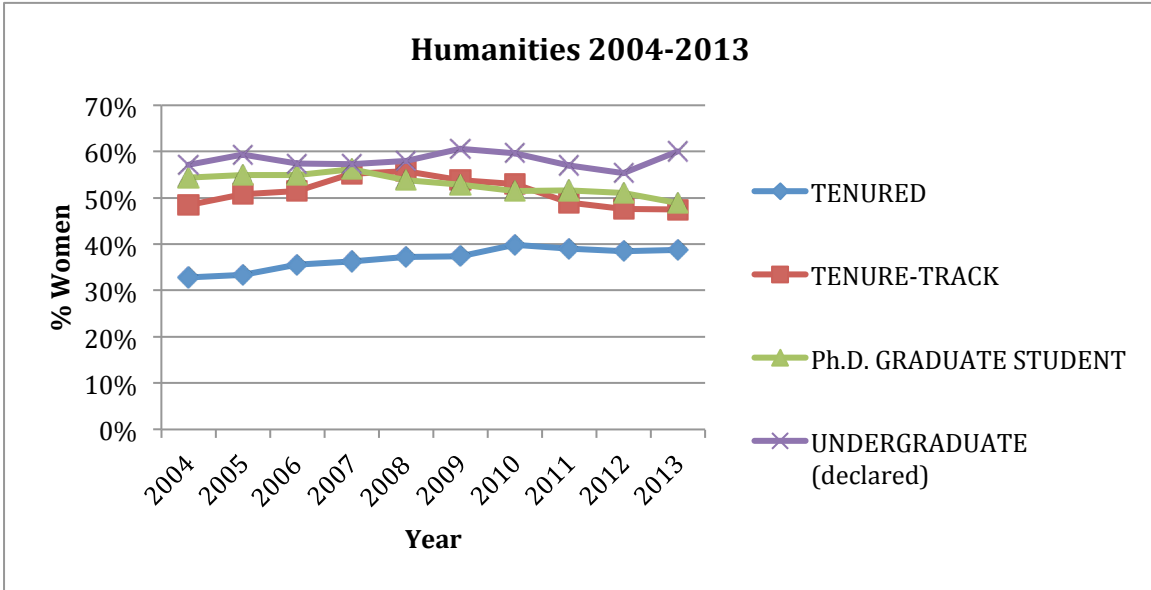


Figure 3: % women for undergraduate students (with declared majors or concentrations), graduate students, tenure-track (untenured) and tenured faculty from 2004-2013 for the division of Humanities.

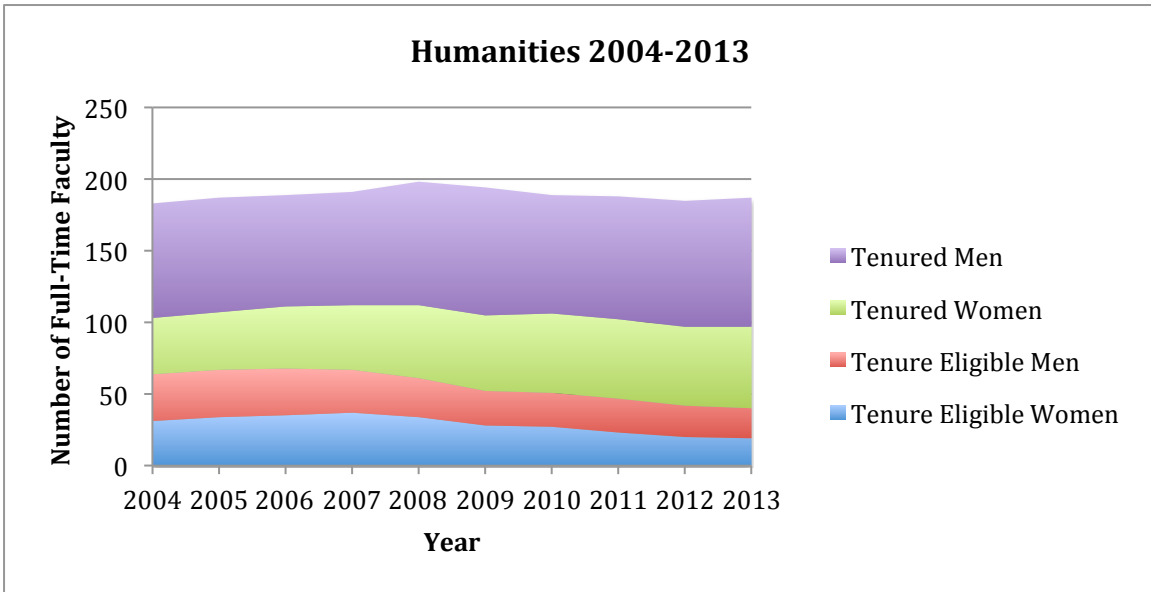


Figure 4: Numbers of Men and Women tenure-track (untenured) and tenured faculty from 2004-2013 for the Division of Humanities.

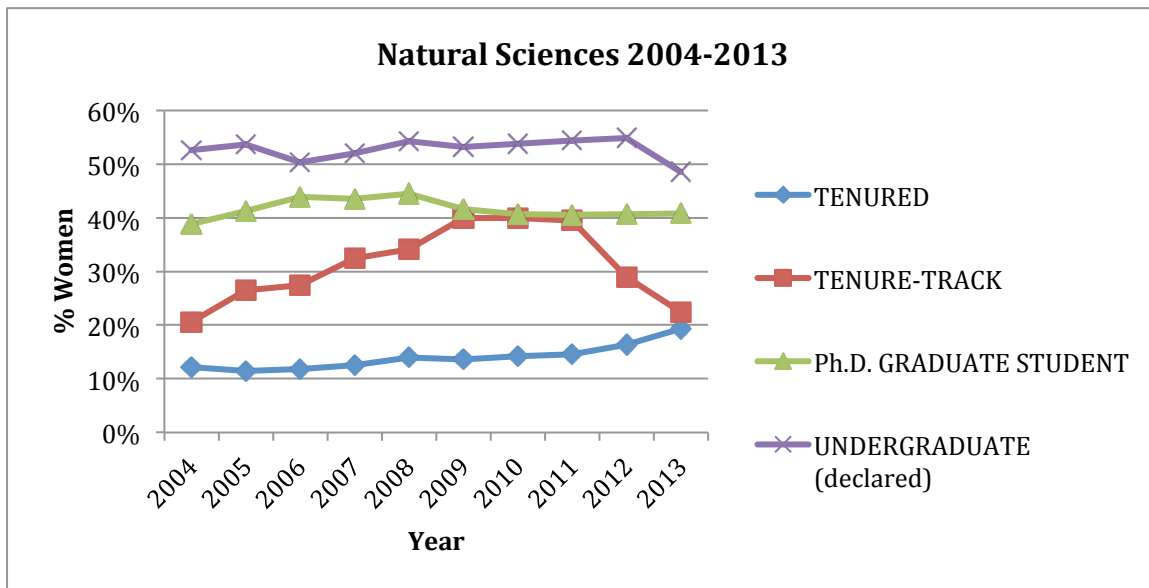


Figure 5: % women for undergraduate students (with declared majors or concentrations), graduate students, tenure-track (untenured) and tenured faculty from 2004-2013 for the division of Natural Sciences.

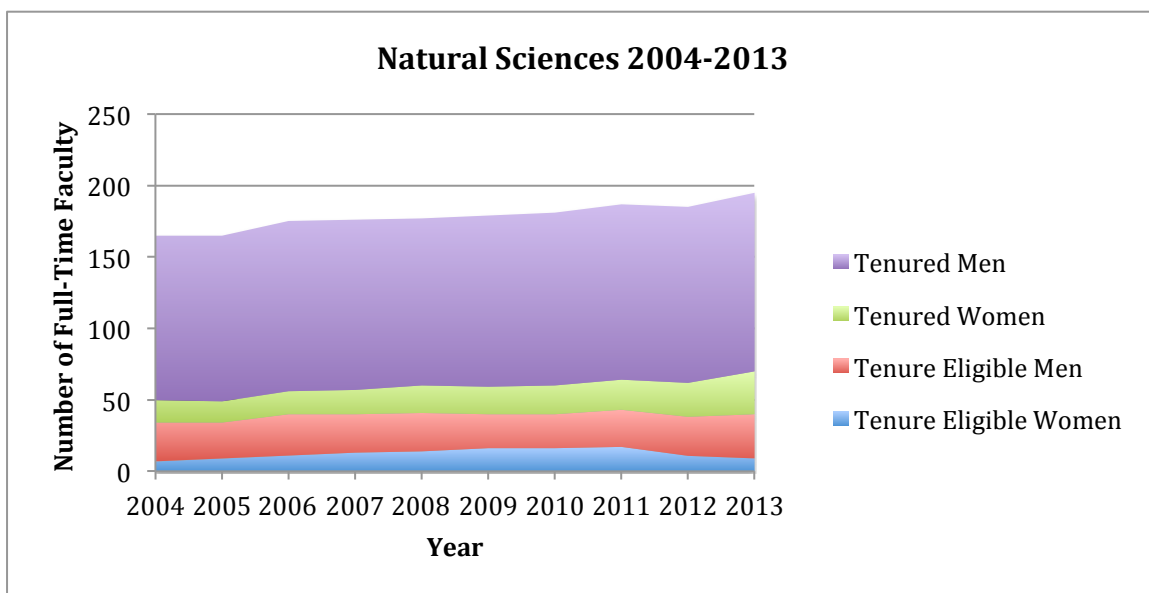


Figure 6: Numbers of Men and Women tenure-track (untenured) and tenured faculty from 2004-2013 for the Division of Natural Sciences.

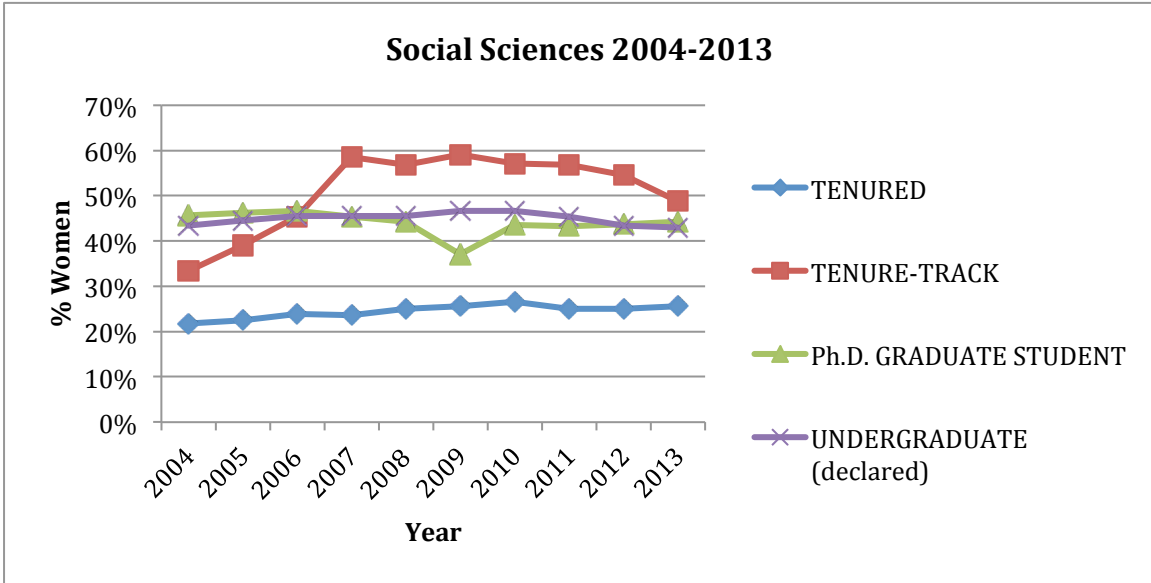


Figure 7: % women for undergraduate students (with declared majors or concentrations), graduate students, tenure-track (untenured) and tenured faculty from 2004-2013 for the division of Social Sciences.

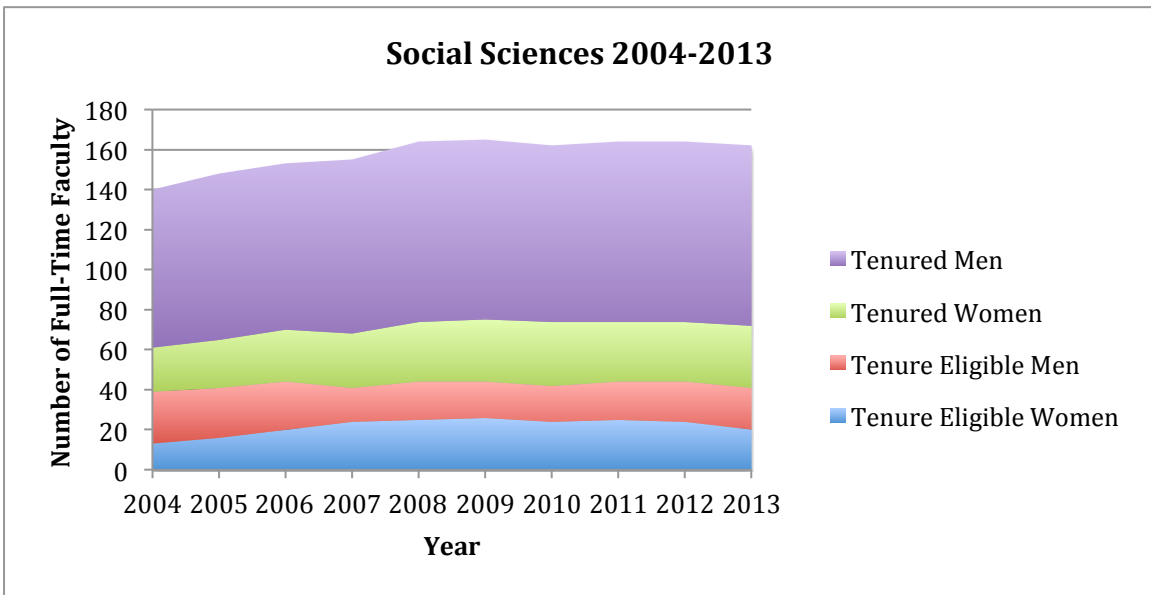


Figure 8: Numbers of Men and Women tenure-track (untenured) and tenured faculty from 2004-2013 for the Division of Social Sciences.

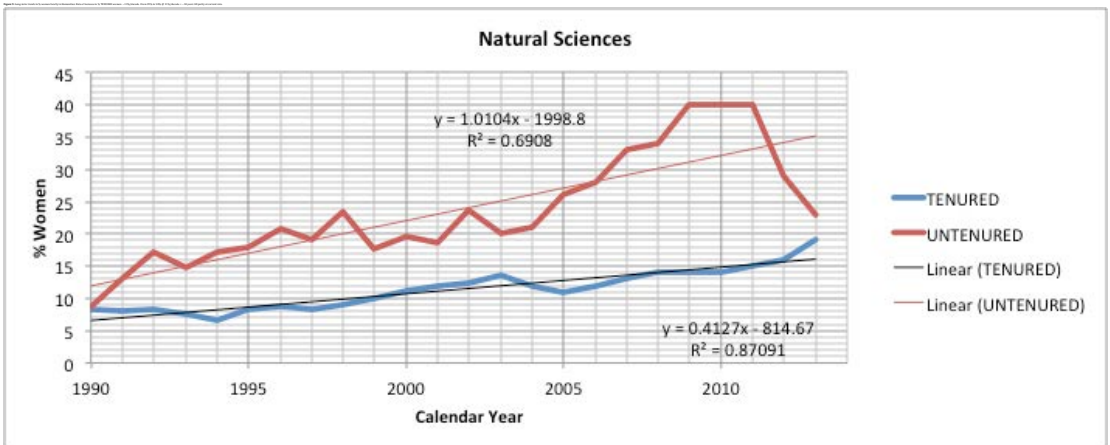
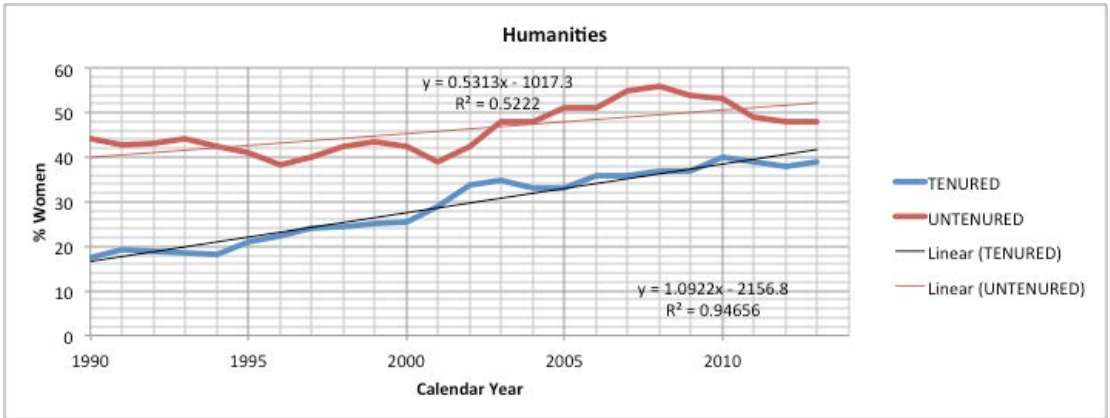


Figure 10: Long-term trends in % women faculty in Natural sciences: Rate of increase in % TENURED women: ~4%/decade. From 19% to 50% @ 4%/decade = ~80 years till parity at current rate.

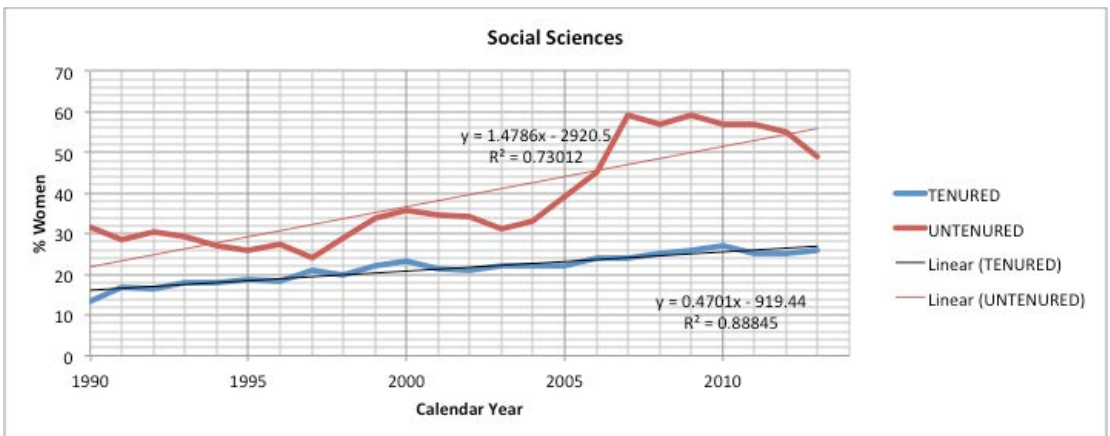


Figure 11: Long-term trends in % women faculty in Social Sciences: Rate of increase in % TENURED women: ~5%/decade. From 26% to 50% @ 5%/decade = ~50 years till parity at current rate.

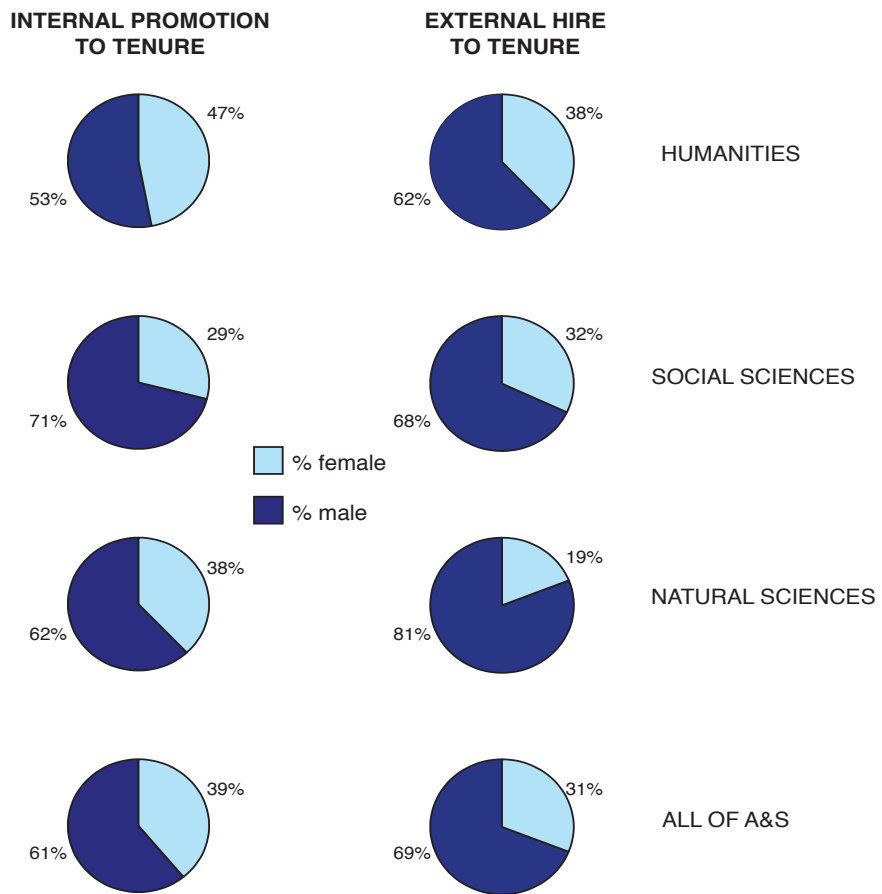


Figure 12: Gender ratio of promotions to tenure and hires with tenure by division and overall for Arts and Sciences 2004-2013.

Average % Women 2004-2013 Through the Faculty Pipeline

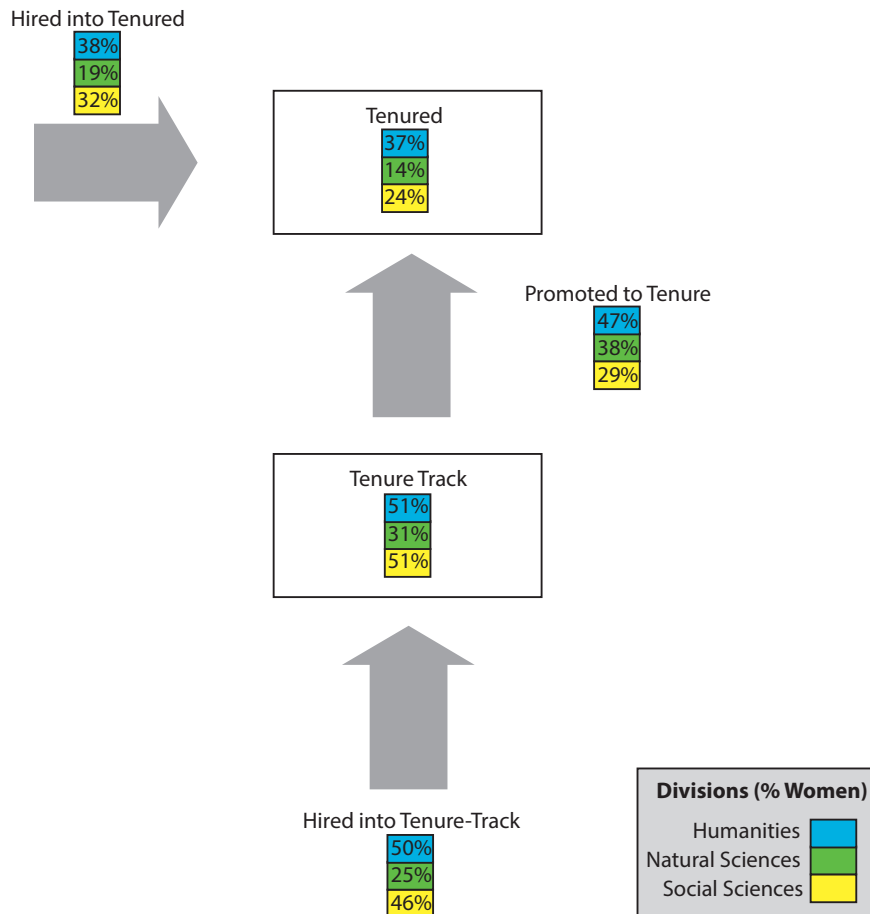


Figure 13: Flow chart for average % women into the Columbia University tenured faculty pool over the course of 2004-2013. *NOTE:* These data are based on changes in the number tenure-track faculty from year to year, tenure data provided by S. Rittenburg, and average department numbers from 2004-2013. Different parts of the chart cannot be compared directly against each other because the cohort of women hired over this time period is not, for instance, the same cohort that went up for tenure over this time period. Many of those going up for tenure were hired prior to 2005, and many of those hired did not yet go up for tenure during the 2004-2013 window.

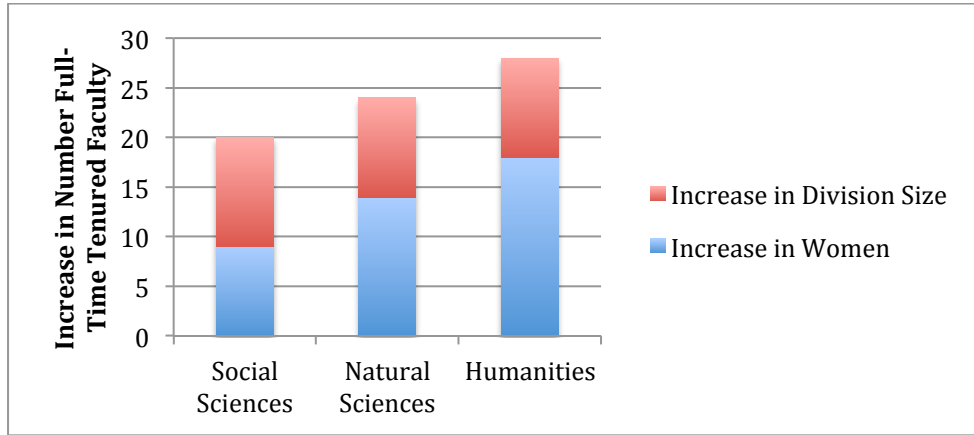


Figure 14: Increase in tenured women relative to increase in overall division size for tenured faculty. In all divisions, growth in the number of tenured faculty led to improvements in diversity. The top of the red bar represents the increase in overall numbers within the division, whereas the top of the blue-section of the bar represents the increase in the number of women on the tenured faculty.

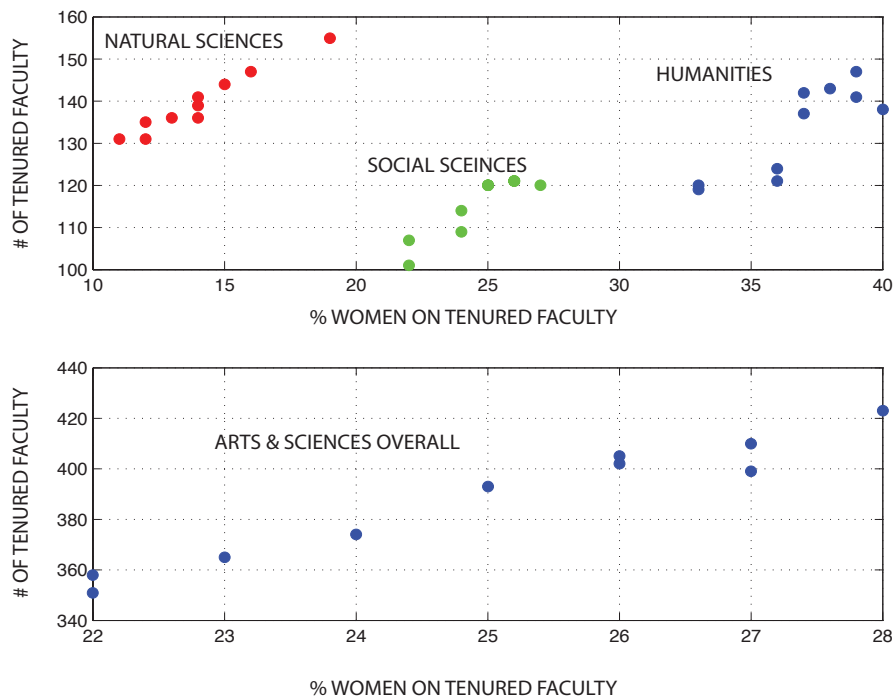


Figure 15: Relationship between the number of faculty in each division (top) and Arts and Sciences overall (bottom) and the % of women in tenured faculty. This illustrates how growth in the number of tenured faculty is closely tied to improvements in diversity of the tenured faculty.

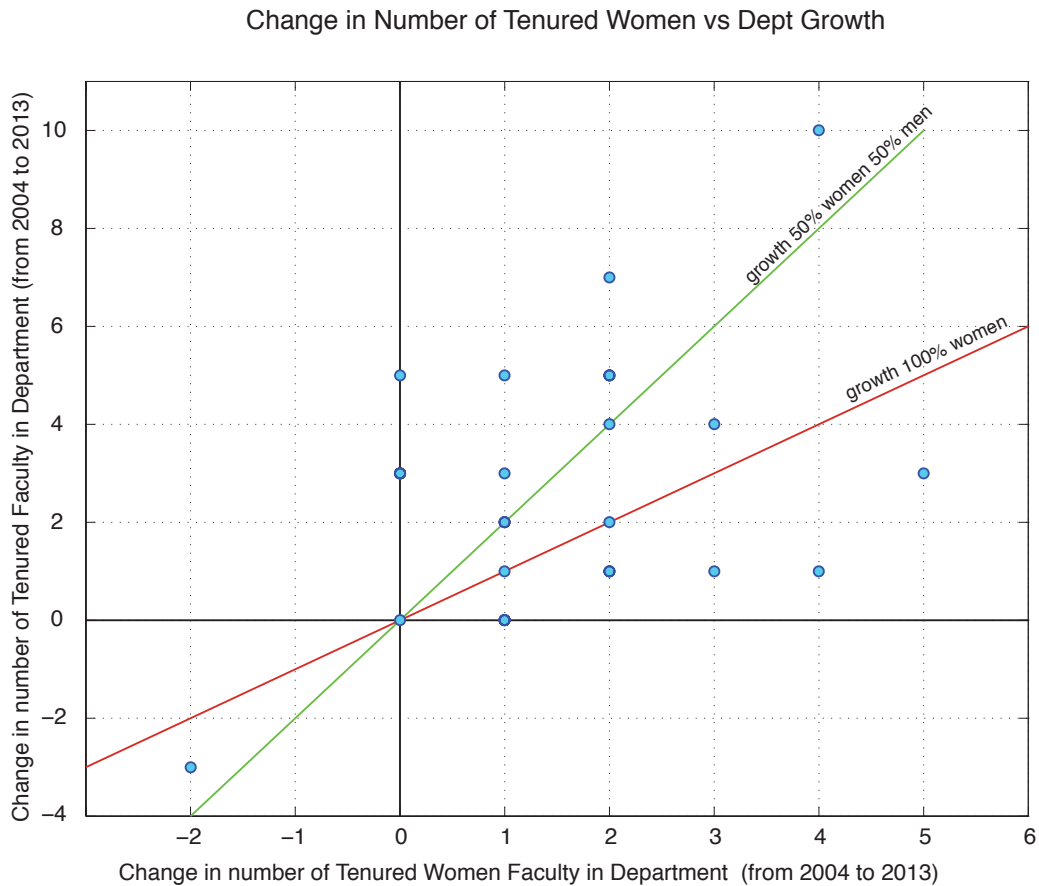


Figure 16: Relationship between department growth and growth in the number of women within the department. Departments at or below the green line accomplished growth at parity or better. Departments at or below the red line had all, or more than all, of it's growth accounted for by women. Departments above the green line did not grow at parity, and some grew without any increase in the number of women. Note, this does not account for all hires in any department, since many replacement hires would have taken place during this time. While the overall trend is that growth significantly improves diversity (Figures 14 & 15), there is substantial variability between departments.

Change in Representation of Women on Tenured Faculty

(2004-2013)

Most Improved

(> 20 % increase in women and/or change in # women
greater than change in department size)

<i>Humanities</i>	Classics English & Comparative Literature French and Romance Philology Italian Music Philosophy
<i>Natural Sciences</i>	Earth and Environmental Sciences Ecology, Evolution. Environmental Biology
<i>Social Sciences</i>	Sociology

Least Improved

(Departments where % women decreased or remained static)

Humanities	East Asian Languages German Middle Eastern Languages and Culture
Natural Sciences	Physics Psychology
Social Sciences	Anthropology History

Appendix: Statistical Analyses

Introduction

The analyses were restricted to Arts and Sciences faculty who were present in 2004 or arrived from 2004 through 2012 with regular tenure-track or tenured appointments. Ad hoc inclusion/exclusion decisions were made in cases where faculty moved into or out of this group, faculty with non-regular appointments pending award of the Ph.D. were treated as regular faculty, and faculty who departed and then later returned were not included in the analysis. The focus was on gender differences in new hires to tenured positions, hires to untenured positions, up versus out, resigning from an untenured position, and resigning from a tenured position. Conditional logistic regression and tests of independence were used in the analyses. Associations with calendar year were considered in addition to associations with gender, and for promotion or resignation, adjustments were made for years-since-hired.

Data were analyzed in terms of overall Arts and Sciences, and broken down by division into Humanities (Division 1), Social Sciences (Division 2) and Natural Sciences (Division 3).

GENDER RATIOS IN HIRING

RE_CODED=NT_ON TRACK

	N	PctN
All	141	100.00
SEX		
F	61	43.26
M	80	56.74

GENDER RATIOS IN HIRING

RE_CODED=NT_ON TRACK

		N	PctN
REPORTING_UNIT	SEX		
1	F	20	32.79
	M	25	31.25
2	F	24	39.34
	M	22	27.50
3	F	17	27.87
	M	33	41.25

GENDER RATIOS IN HIRING

RE_CODED=TENURED

	N	PctN
All	69	100.00
SEX		
F	21	30.43
M	48	69.57

GENDER RATIOS IN HIRING

RE_CODED=TENURED

		N	PctN
REPORTING_UNIT	SEX		
1	F	8	38.10
	M	19	39.58
2	F	9	42.86
	M	17	35.42
3	F	4	19.05
	M	12	25.00

GENDER RATIOS OVER TIME IN HIRING

RE_CODED	Estimate	StdErr	ProbChiSq
NT_ON TRACK	-0.2771	0.0794	0.0005
TENURED	-0.0944	0.1513	0.5329

GENDER RATIOS OVER TIME IN HIRING

RE_CODED	REPORTING_UNIT	Estimate	StdErr	ProbChiSq
NT_ON TRACK	1	-0.2706	0.1319	0.0403
NT_ON TRACK	2	-0.2786	0.1404	0.0471
NT_ON TRACK	3	-0.2665	0.1439	0.0641
TENURED	1	-0.2057	0.2755	0.4553
TENURED	2	-0.3044	0.2891	0.2923
TENURED	3	0.3017	0.2912	0.3001

GENDER AND PROMOTION

Estimate	StdErr	ProbChiSq
-0.3299	0.2228	0.1387

GENDER AND PROMOTION

REPORTING_UNIT	Estimate	StdErr	ProbChiSq
1	-0.0212	0.3390	0.9501
2	-1.0761	0.5083	0.0342
3	-0.0472	0.4121	0.9089

GENDER AND PROMOTION OVER TIME

Estimate	StdErr	ProbChiSq
0.1101	0.0892	0.2172

GENDER AND PROMOTION OVER TIME

REPORTING_UNIT	Estimate	StdErr	ProbChiSq
1	0.0758	0.1384	0.5840
2	-0.00052	0.1551	0.9973
3	0.3510	0.2097	0.0941

GENDER RATIOS IN RESIGNATION FROM UNTENURED POSITIONS

Estimate	StdErr	ProbChiSq
-0.5355	0.3117	0.0858

GENDER RATIOS IN RESIGNATION FROM UNTENURED POSITIONS

REPORTING_UNIT	Estimate	StdErr	ProbChiSq
1	0.2083	0.5113	0.6837
2	-1.4260	0.6324	0.0241
3	-1.3312	0.7119	0.0615

GENDER RATIOS IN RESIGNATION FROM UNTENURED POSITIONS OVER TIME

Estimate	StdErr	ProbChiSq
-0.00026	0.0979	0.9979

GENDER RATIOS IN RESIGNATION FROM UNTENURED POSITIONS OVER TIME

REPORTING_UNIT	Estimate	StdErr	ProbChiSq
1	0.2175	0.2195	0.3217
2	-0.00069	0.1927	0.9971
3	-0.00066	0.2488	0.9979

GENDER RATIOS IN RESIGNATION FROM TENURED POSITIONS

Estimate	StdErr	ProbChiSq
-0.5355	0.3117	0.0858

GENDER RATIOS IN RESIGNATION FROM TENURED POSITIONS

REPORTING_UNIT	Estimate	StdErr	ProbChiSq
1	0.2083	0.5113	0.6837
2	-1.4260	0.6324	0.0241
3	-1.3312	0.7119	0.0615

GENDER RATIOS IN RESIGNATION FROM TENURED POSITIONS OVER TIME

Estimate	StdErr	ProbChiSq
-0.00026	0.0979	0.9979

GENDER RATIOS IN RESIGNATION FROM TENURED POSITIONS OVER TIME

REPORTING_UNIT	Estimate	StdErr	ProbChiSq
1	0.2175	0.2195	0.3217
2	-0.00069	0.1927	0.9971
3	-0.00066	0.2488	0.9979

2004-2013 UPDATE: ADVANCEMENT OF WOMEN THROUGH THE ACADEMIC RANKS OF
THE COLUMBIA UNIVERSITY GRADUATE SCHOOL OF ARTS AND SCIENCES: WHERE ARE
THE LEAKS IN THE PIPELINE?

Commission on the Status of Women & Prof. Daniel Rabinowitz (Dept. of Statistics)
Columbia University Senate*

April 30, 2015

Original Report by:

*The Commission on the Status of Women
November 2001
With updated data in 2004.*

*Commission Membership as of April 2015:

Erin Bryk
Pam Cobrin (Chair)
Katie Conway
Mercy Davidson
Lucy Drotning (ex officio)
Kuheli Dutt
Suzanne Goldberg
Carol Hoffman (ex officio)
Candice Kail
Francine Kershaw
Lisa Northrop
Melissa Rooker (ex officio)
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Executive Summary

The Columbia University Arts and Sciences faculty strive for excellence in all that they do from educating the next generation of undergraduate students and advising graduate students to conducting research, writing, and other scholarship. Excellence is best obtained through a diversity of perspectives, opinions and approaches toward a common goal. As such, faculty diversity is critical to attaining the best scholarship in research endeavors, as well as to providing the student body with the best education and with role models who reflect student diversity.

This report provides a review of one facet of diversity on campus: the progress of women through the academic pipeline within Arts and Sciences at Columbia University, during the 10-year period of 2004-2013 (ending with academic year 2013-2014). The work here follows the [original pipeline study](#) presented in 2001, with updated data added in 2004. While diversity of many types is important – and while Columbia should be attentive to building a faculty that is reflective of the gender, race/ethnicity and other characteristics of the world it seeks to educate and study – this report focuses specifically on gender diversity because of its genesis in the *Commission on the Status of Women*, a subcommittee of the Columbia University Senate, whose mandate is to examine the status, equity, and opportunities available at Columbia to women.¹

The data show that during the first half of the decade the representation of women, particularly at the untenured level, improved significantly. This coincided with both the start of a period when attention and resources were focused on improving the ratio of women faculty within Arts and Sciences at Columbia, and a period of growth for the faculty of Arts and Sciences in general. However, as diversity efforts broadened and Arts and Sciences growth slowed, the situation returned to ‘business as usual’, and tenure-track ratios fell to at or near the levels at the start of the decade, led largely by a decline in Natural Sciences.

The progress in the tenure-track ranks during the early part of the decade demonstrates that the women are there in the pipeline, and that the situation can be addressed quite quickly if resources are available, department willingness is there, and the leadership is focused on these goals. However, the lack of progress in more recent years suggests that the converse is also true: without dedicated resources, willingness, and leadership in this area, Columbia will lose ground.

¹ While our study does not focus on diversity in terms of underrepresented minorities, we include those data, and think that many of the steps proposed herein will be applicable to improving diversity on many levels.

As with the previous report, the underrepresentation of women is most pronounced in the Natural Sciences, still quite pronounced in the Social Sciences (at the tenured level), but less problematic in the Humanities. At present rate of growth, the Natural Sciences will not reach parity until near the turn of the next century. Ratios of the graduate student body are within 10% of parity within all divisions, and have been for at least a decade. Thus the talent pool exists, and more should be done to attract and retain the top scholars of both genders.

Two particularly concerning leaks in the pipeline were identified. The first is that women appear to be leaving Social Sciences positions immediately prior to going up for tenure at a rate strongly disproportionate to men. Second, while the numbers are small, it also appears that women are more likely to leave, once tenured, across all three divisions.

Arts and Sciences, and the departments therein, must re-focus on recruiting and retaining top faculty members who are women at both the untenured and tenured levels. This responsibility lies functionally within departments, but also requires leadership at all levels within Arts and Sciences, as well as resources from Arts and Sciences and from Columbia at large. In addition, the negative impact of zero or limited growth of faculty numbers on the improvements in diversity of faculty should be considered.

Several recommendations are made to address the trends that appear in the data examined for this study:

- The University must be more systematic in collecting data so that less work needs to be put into extracting data, and more work can go into analyzing it. Additionally we recommend that more data be collected in terms of surveys within Arts and Sciences: 1) an MIT-style survey of women's committee and teaching workload, offices, lab space, salary and other similar points of comparison relative to male colleagues, and 2) an initial and follow-up 'quality of life' web-based survey, particularly targeting women faculty, both junior and senior, to try to establish why some groups are leaving at greater rate than their male colleagues, and to highlight aspects that may be working well. Further, as highlighted in the previous pipeline report, we recommend that the university consider conducting, and making openly available, pipeline studies for other schools at Columbia, in particular schools where women are known to be underrepresented, such as the Engineering School and the Business School.²

² One of the biggest challenges in completing this study, and in understanding root causes was lack of access to adequate data. As a result, our study is less comprehensive than the previous study, particularly in the area of hiring and departures. We recommend that the university invest more resources in collection and analysis of institutional data. This requires leadership from Columbia to commit to studying the issue.

- There must be a continued focus on diversity in hiring to recover to the diversity of untenured hiring rates from the early to middle part of this survey period, and hopefully improve on the diversity of external hires into the tenure ranks. Specifically, we recommend 1) that special attention be paid to hiring in Natural Sciences and Social Sciences, 2) that a tenured faculty member point-person within Arts and Sciences be appointed to track progress and help engage departments in diversity hiring opportunities, 3) that information on available resources for diversity hires is more broadly disseminated, and 4) that there is improved flexibility in hires through diversity resources, including timing of funds and a broader scope of use of funds.
- The disproportionate departure of women from the tenured ranks, in addition to the overall pipeline issues, suggests that attention to and dissemination of current research and relevant best practices happen in a more systematic fashion in order to allow for those involved in recruitment, and retention of faculty to be attentive to issues that may unintentionally discriminate against women.

1. Introduction

In 2001, Columbia's *Commission on the Status of Women* conducted the first pipeline study at Columbia, looking at data from 1990-2000, with an updated analysis in 2004, to track the progress of women through the Columbia University pipeline from undergraduate to tenured professor ([Commission on Status of Women, 2001; 2004](#)). That study concluded that progress toward equity was slow, and provided specific recommendations to help improve the rate of progress.

Some of the recommendations from the original pipeline report were followed and others appear not to have been – however, it was hard to even get data on what data is collected and where, and what processes are in place. Importantly, in 2004, a new office was created, led by Professor Jean Howard (George Delacorte Professor in the Humanities and currently Chair of the English Department) as the first Vice-Provost for Diversity, and followed in 2007 by Professor Geraldine Downey who led the office until 2009. In 2010 Professor Andrew Davidson was appointed to lead the Office of the Vice Provost for Academic Planning, which extended and replaced the work of the Office of the Vice Provost for Diversity. Some significant progress toward improving the pipeline has been made in the last decade, in large part because of this office, but progress at the tenured level is still slow.

The literature on the slow progress of women through the academic pipeline is substantial and there are an increasing number of studies that demonstrate how women are subjected to bias in evaluation of their accomplishments, particularly in the sciences (e.g. Valian, 1998; Steinpres et al. 1999; Trix & Psenka, 2003; Davies et al., 2005; Madera et al, 2009; Moss-Racusin et al, 2012; Reuben et al., 2014). This includes bias in obtaining funding (Brouns, 2000; RAND, 2005), differences in how letters of reference are written that negatively impact women (Trix & Psenka, 2003; Madera et al., 2009), lower salaries (Shen, 2013) that don't progress as fast as men (Valian, 2005), and in one study, the conclusion that women had to have 2.5 times more publications than men to achieve the same rating on scientific competence (Wenneras and Wold, 1997). It should be noted that both men and women have been shown to hold such unconscious biases (e.g. Steinpres et al. 1999; Moss-Racusin et al, 2012). In some areas of Natural Sciences that include field work, it has been shown that an alarming proportion of women have been subjected to sexual harassment (~71%) and even assault (~26%) during field work, most often by male colleagues who were senior to them (Clancy et al., 2014). Given these challenges, it is perhaps not surprising that women often leave the academic track at rates disproportionate to men.

The data presented here provide no information on causes for the slow progress of women toward the tenured ranks at Columbia, nor for any specific leaks in the pipeline where women become less well represented as seniority increases. At the tenured ranks progress will necessarily be most slow, since that represents the longest period of residence within one rank, and those ranks are still populated by a generation that was hired at a time when few women entered academia, especially in the sciences. However, the steady drop in women from undergraduate to graduate to tenure-track professor is happening despite

strong representation of women in the preceding ranks for longer than the duration of the residence in any given rank, bar tenured professor. Therefore it can be concluded that those leaks at the more junior level are not simply a result of past policies or practices that have since been reformed.

In [1999](#) & [2002](#) studies by the women tenured professors at MIT highlighted that they felt marginalized and demonstrated that they were being treated significantly differently from their male peers in everything from committee assignments, to lab space, to response to outside offers and salary. The leadership of MIT took a proactive approach to these findings and took steps to remedy the inequalities, leading to a significant improvement of morale among the women scientists, though it was clear in a follow-up [2011 study](#) that focus on the issues needs to be retained. No such study has been conducted at Columbia to date. We recommend that such a study be conducted as soon as possible.

We make this and other recommendations to try to better understand some possible causes of observed issues, but this report primarily seeks to document the progress, or in some cases, lack of progress, throughout Arts and Sciences. Data is described in terms of the overall picture in Arts and Sciences as well as at the divisional level (Humanities, Social Sciences, Natural Sciences), and occasionally at the department level. We also document the progress of underrepresented minorities through the ranks, but the analysis is focused on women, as a *Commission on the Status of Women* report. We hope that the newly forming Senate *Commission on Diversity* will follow up with more detailed analysis on underrepresented minority diversity.

2. Data and Report Approach

The biggest challenge facing this report of was lack of resources to conduct the analysis, and lack of data collection on salient topics. Despite clear recommendations in the last pipeline report for collection of data about arrivals and departures it proved impossible to even access some key pieces of data that were available when the last pipeline report was issued. For instance, the last report highlighted the problem of lack of women in the ‘target of opportunity’ hires into the tenured ranks over the 1990-2000 period. We suspect that the statistics would have improved since most of the hires made through the office of the Vice Provost for Diversity were done as target of opportunity hires. However, it proved impossible to get these data since they were apparently not collated anywhere, and the administrative personnel time to go through the raw data was not available.

Additionally, the original collated data that we were given for the tenure-track positions turned out to include a significant number of off-track positions, so we could not use it. This delayed the report by approximately a year and the analysis that had been completed to that point had to be redone. The final faculty data we got in raw format from Arts and Sciences, and authors of this paper had to process it themselves from scratch. This was a significant time sink, and these kinds of barriers to studying this important problem should not be in place.

One key recommendation we make is that the size of the institutional research office be increased so that pipeline data can be maintained with care and detail, including, hires, types of hires, departures and reasons for departures. This will help a great deal with transparency and identifying issues on something less than a decadal time scale. We note that all the administrators and staff that we worked with on this project were extremely helpful, but significantly overworked already. Columbia has one of the smallest institutional research offices in the Ivy League.

Because of the limitations of the data we had, our analysis in some cases is less detailed than provided in the original report, but with some expert assistance from the Statistics Department through their [free consulting program](#), we were able to conduct some important statistical analyses of the data, described in Section 4.

Most of our analysis is by division, since numbers in individual departments are too small to draw broad conclusions from. However, ultimately, the story is one that varies department by department, with some departments making significant progress in gender diversity and others going backwards.

As a result of the limited resources, we also focus most of our analysis on the faculty end of the pipeline (tenure-track and tenured) where the drop off in representation of women is most pronounced.

3. Observations

Figures 1-8 and Tables 1-4 show the 2004-2013 pipeline data for Arts and Sciences as a whole and broken down into divisions (Humanities, Natural Sciences, and Social Sciences). Figures 9-11 show the trends for tenure-track and tenured faculty from 1990-2013, for comparison with the trends observed in this study.

Undergraduate Students

The data show that, at the undergraduate level, women make up ~50% of the student body (noting that the undergraduate data is necessarily limited to those who have declared a major or concentration). This is the entry point over which Columbia central administration has the most control. When looking at divisions, while percentages fluctuate from year to year, no clear trend is apparent, and women make up on average 58% of Humanities majors, 53% of Natural Sciences majors and 45% of Social Sciences majors.

Graduate Students

At the graduate level, overall in Arts and Sciences, women make up on average about 47% of the student body, with a slight trend toward decreasing over time. This number reflects a divisional average of 53% in humanities, 42% in Natural Sciences and 44% in Social Sciences.

Most notable is the 11% drop in the Natural Sciences Ph.D.'s with respect to the undergraduate student body, and the fact that these numbers have been low in the most recent few years (41%) compared with a high of 44% over several years in the first half of this study period. This is the start of a series of leaks in the pipeline for Natural Sciences.

Social Sciences are notable for having almost no drop in the representation of women relative to the undergraduate student body. With the exception of one year (2009), the numbers are within a few % of each other, and sometimes the graduate student body actually has a higher % of women than the undergraduate student body. The pipeline into graduate school in Social Sciences therefore appears relatively healthy.

Humanities has a small drop in % women graduate students relative to undergraduate, but both numbers are at or above parity. There was decline in % of women graduate students from a high of 56% to a low of 49% in 2013, which should be watched, and potential causes considered. However, because the numbers are at or near parity, this stage of the pipeline still appears healthy.

We do not have data on gender distribution of students who complete their Ph.D., which is an important factor in considering the pipeline and we encourage further examination of this, particularly where women are heavily underrepresented at the tenure-track level.

Untenured – Tenure Track Faculty

Overall, the % of women on the untenured, but tenure-track faculty increased markedly for the first several years of the study period, coinciding with establishment of the Office of the Vice Provost for Diversity. However, following several years of parity, then numbers declined again, returning almost all the way back to levels seen at the beginning of the study period. This pattern is most pronounced in Natural Sciences, but a decline can be seen in the most recent years in all divisions. However, Humanities tenure-track faculty members have hovered around equity for the entire period (from 48-56% women), so this part of the pipeline is healthy, and broadly aligned with graduate student ratios. Social Sciences also increased from 33% to a high of 59% women, before falling back down to 49%, and actually exceeds the % of women undergraduate and graduate students for most of the last decade. So again, this appears to be a healthy pipeline. Natural sciences saw a dramatic increase from 21% to 40% over the first half of the study period, briefly reaching parity with the graduate student body, but then it plummeted back down to 23% by the end of the decade. This represents an unhealthy situation for the long-term pipeline, because historically a significant portion of the increase in tenured women in the Natural Sciences comes through promotion of internal candidates rather than external hires straight into tenure (Figure 12).

Tenured Faculty

Overall, the % of women in tenured faculty positions in Arts and Sciences has continued to grow at a steady, albeit slow, rate. The rates of growth by division are similar, though somewhat slower in Social Sciences where it grew only 4% over the decade (from 22% to 26%). Social Sciences is notable in that it actually has largely plateaued in the number of tenured women over the last half of the decade, with the highest absolute number and % occurring in 2010 (27%). Humanities grew by 6%, going from 33% to 39%, and is the division closest to parity, but it also has plateaued in the last few years. Natural sciences grew the most, at 7%, but is the division furthest from parity with % of tenured women growing from 12% to 19%. However, since much of that growth came through promotions to tenure, it is concerning that the untenured pipeline in Natural Sciences is now little better (+4%) than the tenured faculty, and so concerted efforts will be needed to maintain any growth in Natural Sciences.

Long-term Trends on the Tenured and Tenure-Track Faculty

While a simple look at the beginning and end numbers of the decade, described in the paragraph above, suggests a slightly more encouraging picture, this method is susceptible to small peaks or troughs in the data. For instances the picture of 7% growth of tenured women in Natural Sciences is due in large part to a 3% jump in the last year (2013) when 6 women were promoted/hired into tenure. The dearth of women in the Natural Sciences untenured pipeline suggest 2013 was anomalous, and that the representation of women at the tenured level is now likely to decrease or remain stagnant without focused efforts to improve it.

Figures 9-11 provide a linear fit to the data back to 1990, and show that overall the trends for tenured faculty have not changed significantly. The long-term trend in Humanities for the tenured faculty is an ~11% increase in the representation of women per decade, which means that at current rates, the Humanities division may reach parity in approximately one more decade. For Natural Sciences, the long-term trend was an increase of ~4% per decade, meaning that at present rates of increase it will take close to 80 years to reach parity, or almost the end of the 21st century. For Social Sciences the rate was only moderately better at a little less than 5%, suggesting about 50 years to parity.

The fact that the long-term trends in growth of tenured faculty don't appear to change significantly over the last decade compared to the previous decade, suggests that without the focused diversity efforts of the last decade things may have gotten significantly worse.

Promotions to Tenure and Tenured Hires

We were provided with tenure statistics across the three divisions for candidates that had been put forward by their departments to Arts & Sciences for consideration for tenure either through internal promotion or as part of an external recruitment. Once reaching this stage, the vast majority of all candidates (~92% for internal, and ~97% for external) were tenured, and if anything, women were slightly more likely to get tenure than men, but the numbers are very small. However, statistical analysis (see Section 4) suggests that women in Social Sciences were less likely than men to reach the stage of being put forward for tenure by their department.

The break down into internal versus external tenure cases provides a snapshot of the relative % of women coming into the tenure-track faculty through internal promotions versus external hires (Figure 12). With the exception of Social Sciences, where women were brought into the tenured ranks at very similar proportions both externally and internally (possibly because a potential problem exists with internal promotion – see Section 4, Promotion to Tenure), the pool brought in through internal promotions was significantly richer in women. This is particularly true in the Natural Sciences where the internally promoted pool had double the proportion of women to the external hires (38% vs. 19%). This is especially concerning given the recent downturn in representation of women on the untenured Natural Sciences faculty, where the most recent percent of women is only 23%, making it unlikely that the internally promoted pool will be richer than that in the near future.

One of the major points of concern of the previous pipeline report was the dearth of women hired through 'target of opportunity' hires as opposed to through open searches. For the 1990-2000 period, it was noted that in Natural Sciences of 11 target-of-opportunity hires, zero were women. We were not able to get gender data on the target-of-opportunity hires made in the decade of our study from 2004-2013. Despite recommendations by the last pipeline that these data be carefully tracked, no one appears to be doing so. However, these

numbers should have improved (from zero in the Natural Sciences) given that there were a number of target of opportunity hires through the Vice Provost of Diversity office.

Nevertheless, since there were only 6 female external tenured hires altogether in Natural Sciences, even with the diversity program, compared to 25 men, we suspect that the hiring patterns with respect to gender have not changed substantially outside of directed diversity efforts.

Faculty Pipeline Averages

Figure 13 shows the average relative proportions of women in and flowing through the Columbia Arts and Sciences pipeline, color-coded by division. The aggregate hiring numbers were not made directly available to us, and do not appear to be kept in an organized fashion. Instead we looked through the raw data provided by the office of the Vice-President of Arts, which included hiring dates. With the exception of Social Sciences it is clear that hiring into the (non-tenured) tenure track and promotion to tenure was more effective at increasing tenured diversity than hiring directly onto the tenured faculty, despite focused diversity efforts.

Overall, internal promotions and External hires contribute approximately equally to the numbers of new tenured faculty members, so the dearth of women hired through external searches is a significant drag on the improvement of the tenured ranks, particularly in the Natural Sciences.

Underrepresented Minority Data

Tables 5-7 provide the data for underrepresented minorities from 1992-2014 for undergraduate, graduate student, tenure-track and tenured faculty. Note that for these data the untenured faculty ranks may contain some faculty that Arts and Sciences considers off track faculty, which are not contained in the gender data (see issue outlined in paragraph 2 of Section 2). As mentioned earlier, these data are not the focus of our study, but illustrate another significant diversity problem that the university faces. There is a pronounced drop at the undergraduate to graduate point in the pipeline; relatively similar numbers between the graduate and untenured faculty, suggesting that this point does not represent a huge leak in the pipeline; and a big drop at the tenured faculty level. Of particular note is a recent *decrease* in both the % and the absolute number of underrepresented minority tenured faculty within Social Sciences, suggesting not only possible recruitment issues, but also retention issues. Overall, numbers are alarming small, particularly in the Natural Sciences.

Department-level Changes & Growth in Tenured Faculty

The observations discussed above are made on an Arts and Sciences wide or divisional basis to ensure that numbers are large enough to be meaningful. However, each one of the hires, promotions, retentions and departures are occurring at the department level, and each has

its own story. The previous report noted that in general, growth of departments was a key factor in improvements in diversity, and overall our data back this up, as detailed below.

Division Level Growth

Figure 14 shows the overall growth in tenured faculty numbers within a division compared to the growth in number of tenured women. With the exception of Social Sciences, more than half of the growth in the number of tenured faculty is accounted for by growth in the number of women faculty. The increase in division size is accounted for by 45% women in Social Sciences, 58% women in Natural Sciences and 64% women in Humanities. Figure 15 shows how the improvements in diversity within each division, and Arts and Sciences overall, were closely tied to increases in the number of faculty.

Department Level Growth

However, as Figure 16 shows, growth in women was not accomplished evenly across growing departments. Some departments increased the number of tenured women faculty by a greater amount than the department grew altogether (indicating departing/retiring men being replaced by women). Other departments doubled in size, but didn't hire a single additional woman. As with the previous pipeline report, we provide a list of the 'most improved' departments and 'least improved' departments (page 45). The most improved departments were defined as those that had a > 20% increase in the representation of women, and/or a greater change in the number of women than the change in the department size. The least improved departments were those where the representation of women on their tenured faculty actually decreased (5 departments), or remained the same (2 departments), despite the department growing.

4. Statistical Analysis

Statistical analysis of hiring, promotion and resignation patterns over the course of the study period was conducted by Professor Daniel Rabinowitz (Dept. of Statistics). Because these data were not directly available (with the exception of resignation), they had to be derived from changes and criteria associated with specific names in the raw catalogues provided by Arts and Sciences.

Statistical methods are outlined in the Appendix, along with the statistical test results. Estimates of regression coefficients and their associated p-values may be viewed as descriptive of the history of hiring, promotion, resignation, and retiring; to view estimates and p-values as statistical inferences about the culture of our institution would be predicated on the view that the experiences of individual faculty members are independent replications with common probabilistic properties. In other words, the statistical methods applied here are not necessarily appropriate for the type of dependent data examined, but are nevertheless useful in understanding the strength of apparent signals in the data.

Trends and observations are detailed below, with nominal statistical significance noted where present. Overall, despite the fact that these are small numbers, the results represent summaries of the history. Perceptions of greater hiring of men over women, perceptions of greater likelihood for women to resign at the tenured level, and for women being less likely to be put up for tenure are born out by a review of the data.

STATISTICAL RESULTS

Hiring – Untenured Faculty (Tenure-Track)

- Men were hired at greater rate than women among untenured (tenure-track) positions overall in Arts and Sciences (statistically significant). However, this does not account for the variability in the hiring pool.
- By divisions, there were slightly more men in Humanities, roughly equal numbers in Social Sciences, and vastly more in the Natural Sciences.

Hiring – Tenured Faculty

- Men were hired at a greater rate than women in the tenured ranks, with more extreme ratios than in the junior faculty hiring (statistically significant). Again, this does not account for the variability in the hiring pool.
- By division, vastly more men were hired in all divisions, with the Natural Sciences being the most extreme.

Hiring - Trends

- Overall, rates of hiring of women relative to men *decreased* with time, with the decrease more marked in non-tenured (statistically significant).
- By division, the trend is positive among the tenured natural scientists, but negative for all the non-tenured groups and tenured Social Sciences and Humanities.

Promotion to Tenure

- Women were less likely than their peers to be promoted (from untenured to tenured). This happened in all three reporting units, although the effects were negligible in Humanities and Natural Sciences, but substantial in the Social Sciences (statistically significant). Note: this happens before the cases reach university-level tenure review. At that step, 96% of women and 90% of men were tenured. Information was not available on why women left before this step.
- Overall the situation with respect to promotion seemed to improve for women over time, except in Social Sciences where the situation remained the same.

Resignations – Untenured Faculty (up to 5 years of service)

- Overall, women were less likely to resign from untenured positions (after adjusting for years of service), though this was not statistically significant. Note this does not include resignations immediately prior to going up for tenure, which are covered in promotion (above).
- By division, women were less likely to resign in Social Sciences (statistically significant) and Natural Sciences (barely significant), but more likely in the Humanities (not significant).
- Overall there were no significant trends over time with respect to untenured resignation, with no effect in Natural Sciences or Social Sciences, but perhaps likely more likely to resign overtime in Humanities.

Resignations – Tenured Faculty

- Overall, women were much more likely to resign from tenured positions.
- This trend was true across all divisions (Natural Sciences, Social Sciences and Humanities).
- Over time this trend was decreasing but with the change being almost entirely due to Natural Sciences.

5. Conclusions

PIPELINE TRENDS

1. While diversity in the tenured ranks at Columbia continues to improve overall, the rate of improvement does not appear to have changed significantly from the previous decade. At current rates it will take close to a century to reach parity in Natural Sciences, and about half a century in the Social Sciences, although Humanities is on track to be at parity in approximately a decade, assuming the recent stall is not maintained (see 3 below).
2. The representation of women in the non-tenured ranks has been decreasing in the last several years, and this decrease is particularly pronounced in the Natural Sciences. This could lead to a stall in progress at the tenured level. Overall there is a highly significant trend for hiring women at the untenured rank to be getting worse over time.
3. The number of tenured women in Humanities and Social Sciences appears to have stalled in the last 3-5 years of the study.
4. Women are more likely to be brought into the tenured ranks through promotion from untenured ranks than through hiring directly into the tenured ranks for Natural Sciences and Humanities, making the internal Columbia tenure-track pipeline particularly important for these divisions.

LINK OF DIVERSITY TO GROWTH AND FOCUSED ATTENTION

5. Focused gender diversity efforts, combined with a growth in the number of Arts and Sciences (A&S) faculty, in the ~2004-2008 time period appear to have been effective in increasing diversity in the tenure-track ranks. However, as growth decreased, or stalled altogether, and diversity efforts became broader and less focused on A&S, hiring patterns appear to have plateaued and in some cases reverted back to the original diversity level of a decade ago.
6. The decline in untenured ranks is led by the Natural Sciences, despite near parity in the graduate student body. The reasons for this are unknown, but it coincides with less focused attention on diversity within Natural Sciences as the scope of the Office of the Vice Provost for Diversity was broadened.
7. Overall, improvements in diversity appear to be closely tied to growth of A&S faculty, particularly at the tenured level, with the major improvements occurring when divisions were growing, and decreases or stalls occurring when growth was small or non-existent.

8. At the department level, in general, an increase in department size leads to an improvement in gender ratios. However, this varies significantly department by department, with some departments showing dramatic improvement, and a few decreasing in diversity despite increasing in size.

CLEAR LEAKS IN THE PIPELINE

9. Women in Social Sciences are significantly more likely to leave the untenured ranks immediately prior to going up for tenure than men.
10. Women are more likely than men to depart from tenured ranks, though it is not statistically significant. However, the lack of significance is at least in part because the pool is so small.
11. The recent drop in hiring of women at the untenured level is going to negatively impact progress at the tenured levels without focused efforts to hire more women at both the tenured and untenured ranks.

ISSUES TO ADDRESS MOVING FORWARD

12. Ultimately the responsibility for diverse and equitable hiring and promotion practices starts at the department level, with huge variability in growth of representation of women from department to department. Solutions need to be tailored to the issues facing specific departments from low pipelines to hiring practices. On a department scale, where women are significantly underrepresented on the faculty, they often (though not always) are also significantly underrepresented at the student level, suggesting a multi-level approach is needed. However, for most departments the pipeline is healthy at the graduate student level, and for many, it is healthy at the untenured level.
13. Departments within Arts and Sciences have not been particularly pro-active in accessing the most recently available diversity funds. This may in part be because communication about accessibility of these funds seems minimal at the department level, and confusion abounds.
14. Many of the conclusions of the first pipeline report still hold true, and many of the recommendations appear to remain unimplemented.
15. Conclusions and timeliness of this report were significantly hampered by lack of access to relevant data, and lack of staff to help assemble and analyze the data. This appears largely to be because data is not collected in a consistent and readily accessible fashion as recommended by the previous pipeline report.

6. Recommendations

DATA NEEDS

As per the prior Pipeline Report, the University needs to be much more systematic in collecting data so that less work needs to be put into extracting data, and more work can go into analyzing it. Additionally we recommend that more data be collected in terms of surveys within Arts and Sciences. We specifically recommend that:

1. The University increase the size of the Institutional Research Office. We have one of the smallest such offices in the Ivy League.
2. Arts and Sciences conduct an MIT-style survey of women's committee and teaching workload, offices, lab space, salary and other similar points of comparison relative to male colleagues. This should be led by tenured faculty.
3. Arts and Sciences conduct an initial and follow-up 'quality of life' web-based surveys, particularly targeting women faculty, both junior and senior, to try to establish why some groups are leaving at greater rate than their male colleagues, and to highlight aspects that may be working well.
4. Incorporate analysis of underrepresented minorities into the above surveys.

HIRING PRACTICES

Continued focus on diversity in hiring is essential to recover to the diversity of untenured hiring rates from the early to middle part of this survey period, and hopefully improve on the diversity of external hires into the tenure ranks. Specifically we recommend:

5. Special attention be paid to hiring in Natural Sciences and Social Sciences, keeping a close eye on the untenured pipeline, particularly in Natural Sciences, but also on the diversity of external hires to tenure in both divisions.
6. Appoint a tenured faculty member point-person within Arts and Sciences to track progress and help engage departments in diversity hiring opportunities.
7. Broaden dissemination of information on available resources for diversity hires so that everyone at the department level is engaged.
8. Improve flexibility in hires through diversity resources, including timing of funds and a broader scope of use of funds.

RETENTION AND RECRUITMENT

The disproportionate departure of women from the tenured ranks suggest that Arts and Sciences appears to be less successful at retaining women who receive outside offers, though no data is collected on this. Below we have recommendations that might help improve retention of women faculty, but should also help attract the outstanding women faculty that we are seeking to hire.

9. Recognize that a narrower band of the societally regarded 'acceptable' behavior for women makes it harder for them to negotiate competitive retention or hiring packages, and women often 'under-ask' relative to their male peers. Consider offering women more than they ask for, particularly if they 'under-ask' relative to recent comparable male hires or retentions.
10. Recognize that women may be less likely to seek outside offers specifically for salary raises, and since this is a primary tool used for obtaining higher salaries, this may lead to a *de facto* discriminatory salary policy.
11. Recognize that getting the best women may sometimes require making spousal hires, and that hiring male partners of women being retained or recruited should get the same priority as hiring female partners of male faculty being retained or recruited.
12. Ensure closer diversity oversight for hiring committees – in particular for departments that have fallen behind. Ensure [best practices](#) at every stage, including clear criteria for structuring search committees.
13. Recognize that diversity is best achieved in an environment of stable growth of faculty.

EXPANDING PIPELINE STUDIES

14. Finally, as highlighted in the previous pipeline report, we recommend that the university consider conducting, and making openly available, pipeline studies for other schools at Columbia, in particular schools where women are know to be underrepresented, such as the Engineering School and the Business School.

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ADVANCEMENT OF WOMEN THROUGH THE ACADEMIC RANKS OF
THE COLUMBIA UNIVERSITY GRADUATE SCHOOL OF ARTS AND SCIENCES:
WHERE ARE THE LEAKS IN THE PIPELINE?

The Commission on the Status of Women

November 2001

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EXECUTIVE SUMMARY

Over the last decade, there has been progress toward gender equity within the Arts and Sciences at Columbia University. In 1990, women represented 30.8% of the tenure-eligible faculty; by 2000, this had risen to 33.3%. Over the same time period, representation of women among the tenured faculty rose from 13.2% to 19.9%. Some specific departments where women were underrepresented at the start of the study period have moved toward equity at rates far faster than these averages.

Although there has been progress, it has been slow and unevenly distributed, especially over a time that saw a nationwide increase in women completing Ph.D.s in many disciplines. This pipeline study attempts to identify the choke points in the system, the points where women do not seem to be making the same gains as do men in progressing through the academic system, attaining Ph.D.'s, attaining entry-level jobs, and attaining tenure.

We note the following areas of concern:

- Among Ph.D. students, we see a higher level of attrition among women than men in all divisions of Arts & Sciences. Female-rich attrition occurs both early and late in the graduate student career, among both funded and unfunded students. This problem does not appear to be improving over time.
- For the tenure-eligible faculty ranks, we see a leak in the pipeline at the entrance to the applicant pool. Compared to national availability data, or to Columbia's own Ph.D. production rate, Columbia is attracting substantially less than its share of female applicants for junior faculty jobs. Once within the applicant pool, women are hired at an equitable rate.
- For entry into the tenured ranks, we find that the promotion process has contributed toward improving the gender balance of the tenured faculty, but the process of hiring from outside directly into tenure has not. External hires into tenured positions in Social Sciences and Natural Sciences are only half as likely to be female as are candidates promoted from within the University. This is important, because fully half of all new appointments to tenure come from outside Columbia. The imbalance is particularly bad for "targets of opportunity" (applicant pool of one) within the Natural Sciences; eleven male and zero female scientists were hired through this mechanism over the decade studied.

We also note that management decisions taken without consideration of gender balance may have unintended gender consequences. Over the decade of our study period, progress toward gender equity seems closely linked to expanding faculty size in a given unit. Departments, divisions, and ranks that are growing in overall number of faculty have had the most success in moving toward gender equity, while areas that have diminished in size have in some cases actually decreased their percentage of women. Consequently, as the demographics of the faculty shift, from division to division, department to department, untenured to tenured, special care must be taken to ensure that such shifts do not inadvertently retard progress toward gender equity.

This study concludes with recommendations for action and for further study. In brief, we recommend that the University:

- extend the pipeline study to other parts of the University, and to possible causative factors, such as inequity in workload and non-salary support;
- identify and rectify the causes of Ph.D. student attrition, through exit interviews with departing students, a stronger support system for first-year students, and examination of longitudinal data to identify pressure points;
- proactively recruit qualified women to apply for entry-level faculty jobs at Columbia, and examine factors that may be discouraging women from applying for Columbia jobs;
- bring the gender ratio among external hires into the tenured ranks into line with the gender ratio of promotions from within the University.

1. INTRODUCTION

In the spring of 1998, the Commission on the Status of Women, working with the Office of Institutional Research, began to collect data on women's progress through the academic pipeline at Columbia. Loosely modeled on the University of Michigan study of 1996, this effort represents an attempt to chart the relative success of men and women progressing through the academic ranks: earning degrees, attaining faculty posts, advancing to tenure, receiving benefits and support from the institution, and maintaining a manageable workload.

Invaluable staff support has been provided to the Commission by Lucy Drotning of the Office of Institutional Planning and Research.

Scope of the present report

Addressing all relevant pipeline issues for women in all divisions of the University was a task that the Commission and one research staff member could not accomplish in one or two years. We therefore constrained the initial scope of the study to two areas. On the matter of earning degrees, we looked at attrition rate of students enrolled in Ph.D. degree programs and within the Arts & Sciences. With respect to recruitment to and advancement through the faculty ranks, we looked at faculty in the Arts & Sciences (exclusive of the School of the Arts).

Additional crucial pipeline issues remain to be studied. These include: male versus female attrition among undergraduates, masters candidates, and professional school students; recruitment to and advancement through the faculty ranks of the professional schools; male versus female likelihood of success at tenure review; gender equity in distribution of workload; and gender equity in receipt of benefits and support from the University.

Organization of the report and definitions

This report begins with an examination of the current demographics of the Arts & Sciences student body and faculty and the demographic trends over the last decade (1990–2000). We then work upward through the academic ranks looking for leaks in the pipeline, beginning with graduate student attrition, continuing with hiring into tenure-eligible positions, followed by promotion/recruitment into the tenured ranks. Following this vertical slice through the data, we take

a horizontal slice, emphasizing the importance of microclimates in individual departments or divisions. The report concludes with recommendations for both further work and changes to procedures and policies.

Some data is reported according by “division.” Exhibit 1 defines which departments make up each division. In the discussion of faculty, “tenure-eligible faculty” includes instructors, assistant professors, and associate professors without tenure. “Tenured faculty” includes associate professors with tenure and full professors. Adjunct or visiting faculty and professors without tenure are not included in the study.

2. DEMOGRAPHICS

Student body

The undergraduate and graduate student bodies are both close to 50:50 men:women, integrating across the Arts & Sciences, and not counting Barnard or SEAS. Following the admission of women to Columbia College in 1983–1984, the percentage of women in the college expanded rapidly until approximately 1990. Since 1990, the percentage of women in Columbia College and among the Arts & Sciences graduate students has risen slowly, approximately half a percent per year.

Not surprisingly, given the national trends, the gender makeup of the student body varies from division to division (Exhibits 2, 3, and 4). Of the divisions, Humanities has the largest percentage female graduate students and female majors/concentrators (both approximately 60%). Social Sciences (approximately 47%) and Natural Sciences (50% undergrad majors/concentrators and 33% grad) have lower percentages.

The trend lines for female representation tend upward in all of the divisions, for both graduate students and undergraduate majors/concentrators (Exhibits 2, 3 and 4). The increases are slow but steady, in the range of 1–10 % change over the interval from 1990 to 2000.

In Humanities and Social Sciences, the trend lines for undergraduate and graduate female percentages (Exhibits 2 and 3) track within a few percentage points of each other. But in Natural Sciences (Exhibit 4), there is a persistent gap of 17–22 percentage points between graduate and undergraduate female representation (1990: 50% women among undergrad majors/concentrators versus 30% women among grad students; 2000: 50% women undergrad majors/concentrators versus 33% women grad students). Is this part of a national trend, or is it possible that Columbia’s Natural Sciences departments are underrecruiting women for their graduate programs?

Faculty

Exhibit 5 gives a snapshot of the women’s position on the Arts & Sciences faculty in academic year 2000. The higher the rank, the lower the number of women in that rank: 17% of tenured full professors were female; 33% of associate professors; 35% of assistant professors; as contrasted with 62% of lecturers and associates. In the non-tenure-eligible ranks of lecturer and associate, women outnumber men. In the tenure-eligible and tenured ranks, men outnumber women. Note that there are approximately as many full professors (N=292) as all of the other full-time instructional ranks combined (N=304), so that the male-rich gender ratio at the top of the hierarchy weights the entire faculty toward a more disproportionate gender ratio.

In keeping with the national trends, women are best represented among the Humanities faculty, less abundant in the Social Sciences, and least represented in the Natural Sciences (Exhibits 2, 3, and 4). This hierarchy of Humanities>Social Sciences>Natural Sciences is found at both the tenure-eligible and tenured ranks, and has persisted over the decade covered by this study.

Looking back over the last decade, the percentage of women among the tenure-eligible faculty in all of the Arts & Sciences stagnated at around 30% female between 1990 and 1997, and then rose slightly to 33% (58/174) by 2000 (Exhibit 6). This rate of increase seems very slow given the influx of young women into the Ph.D.-bearing ranks across the country during this decade. In the Humanities (Exhibit 7), tenure-eligible faculty dropped very slightly from 44% to 43% women, as the total number of tenure-eligible professors shrink from 91 to 54. In the Social Sciences (Exhibit 8), the junior faculty went from 19 women (32%) in 1990 to 20 women (36%) in 2000. Almost all of the gain in tenure-eligible women was achieved in Natural Sciences (Exhibit 9), which started at a low baseline of 5 women (9%) in 1990, and rose to 15 women (23%) by 2000.

Among the tenured faculty across all of the Arts & Sciences, both the percentage and number of tenured women increased slowly but surely between 1990 and 2000, from 13% (39/296) to 20% (68/341). This occurred in the context of an expanding tenured faculty (Exhibit 6). In the Humanities (Exhibit 7), the number of tenured women grew from 19 to 31, resulting in a tenured faculty that was 25% female by 2000. In the Social Sciences (Exhibit 8), the number of senior women grew from 12 to 24, while the senior faculty as a whole went from 91 to 101, resulting in a tenured faculty that was 23% women by 2000. In the Natural Sciences (Exhibit 9), the number of tenured women was 8 in 1990, dropped to 6 in 1994, got out of single digits in 1998, and reached 13 (11%) in 2000.

Relationship between gender balance and growth rate

Over the 1990–2000 study interval, those components of the faculty that experienced overall growth in number of individuals have generally made substantial progress toward gender balance:

- total A&S tenured faculty (296 → 341 individuals; 13% → 20% women)
- Humanities tenured faculty (109 → 122 individuals; 17% → 25% women)
- Social Sciences tenured faculty (91 → 103 individuals; 13% → 23% women)
- Natural Sciences tenure-eligible faculty (57 → 64 individuals; 9% → 23% women)
- Natural Sciences tenured faculty (96 → 116 individuals; 8% → 11% women)

On the contrary, those elements of the faculty where the total number of individuals has decreased have generally* been less successful in moving toward gender balance:

- total A&S tenure-eligible faculty (208 → 174 individuals; 31% → 33% women)
- Humanities tenure-eligible faculty (91 → 54 individuals; 44% → 42% women)

* Social Sciences tenure-eligible faculty presents a mixed trend. From 1990 to 1997, the pattern held: 60 → 58 individuals; 32% → 24% women. But from 1997 to 2000, the trend reversed: 58 → 56 individuals; 24% → 36% women)

This association between faculty growth rate and progress toward gender balance reflects the reality that the easiest way to change a gender balance is through new hires, and new hires happen more frequently in growing departments and divisions. This reality needs to be taken into account when allocating new faculty lines.

The other way to change a gender balance is through disproportionate gender balance in faculty departures. The current study did not examine the gender ratio of faculty leaving Columbia; this should be done.

Relationship among gender, rank, and disciplinary balance

Columbia's progress in advancing the percentage of women in the graduate student and faculty ranks over the 1990–2000 interval must be considered in the context of the changing disciplinary and rank balance of the Arts & Sciences over this time interval.

Between 1990 and 2000, both the Ph.D. student body and the faculty became less Humanities-heavy. In 1990, the Ph.D. student body was 44% Humanities (1212/2761), 38% Social Sciences (1033/2741), and only 18% Natural Sciences (516/2761). By 2000, Humanists were down to 41% of the graduate student body (949/2292), Social Scientists down to 36% (834/2292), and Natural Scientists had increased to 22% (509/2292). A shift of comparable magnitude out of Humanities occurred in the faculty. In 1990, the total tenured + tenure-eligible Arts & Sciences faculty was 40% Humanities (200/503), 30% Social Sciences (150/503), and 30% Natural Sciences (153/503). By 2000, Humanists were down to 34% (176/515), while Natural Scientists were up to 35% (180/515); Social Scientists held nearly steady at 31% (159/515). To the extent that women have a stronger presence in Humanities than in the Social or Natural Sciences, this shift in disciplinary balance has made it harder to achieve a substantial increase in the overall number or percentage of women.

Over this same interval, the tenured:tenure-eligible ratio among the faculty shifted toward the tenured. In 1990, 59% of the tenured + tenure-eligible faculty had tenure (296/504). By 2000, the percentage had risen to 66% (341/515). Because of the relatively recent entry of substantial numbers of women into some A&S disciplines, the available pool of qualified women in some fields remains small at the tenured level. Thus the shift toward a more heavily tenured faculty has probably worked against the effort to increase the overall number and percentage of women in the faculty.

Comparison of student versus faculty gender ratios

In considering gender balance among the faculty, one tough question is, What should the goal be; what would be a fair or desirable ratio of women to men on the faculty?

One possible way to answer this question is to say that the gender ratio among the faculty in any division should approximate the gender ratio among the graduate students in the same disciplines. At a school like Columbia, which trains Ph.D. students for careers in academia, the percentage of women among the graduate students is an indicator of how many women aspire to, and are appropriately trained for, careers as professors. Furthermore, a faculty gender ratio approximating the student gender ratio facilitates mentoring relationships among that subset of students who prefer a mentor of their own gender.

Progress toward this goal would be represented by convergence between the faculty lines and the Ph.D. student lines in Exhibits 2, 3, and 4. By this measure, Columbia has a long way to go (Exhibit 10). The gap between female representation in the graduate student body and that in the tenured faculty is 28 percentage points, ranging from 22% in Natural Sciences to 33% in Humanities. This situation is not improving very quickly: back in 1990, the gap was 32%. For tenure-eligible faculty, the gap is smaller but still substantial (15%). In Social Sciences and Humanities, the gap between female representation among tenure-eligible faculty versus graduate students has actually increased between 1990 and 2000.

One bright point in the picture is the rapid convergence between the percentage of women among Natural Sciences tenure-eligible faculty and graduate students, shrinking a 21% gap down to a 10% gap between 1990 and 2000 (Exhibits 4 and 10). In light of the comments above about growth rate, it may be significant that the Natural Sciences is the only division where the number of tenure-eligible faculty did not shrink over the study period.

Summary of demographics and trends

Columbia's Graduate School of Arts & Sciences has made some progress over the last decade in increasing the participation of women in the undergraduate and graduate student body, and in the tenure-eligible and tenured faculty. The student body now approximates a 50:50 male:female ratio, which is probably a healthy and desirable situation. Among the faculty, women are less represented at higher ranks than in lower ranks, and less represented in the Natural Sciences than in the Humanities or Social Sciences, reflecting the national trends. The representation of women in the faculty still lags far behind that which would be expected or desired, given the influx of women into Ph.D. programs and professions across America in the last quarter century. In general the trend lines for representation of women among the faculty are not close to converging with the trend lines for representation of women among the Ph.D. students in similar disciplines. Progress in advancing the number and percentage of women in the tenure-eligible non-tenured ranks has been especially slow, even more so than for the tenured ranks.

RECOMMENDATIONS ARISING FROM EXAMINATION OF DEMOGRAPHICS

- As a target for monitoring progress toward achieving gender balance among the faculty, Columbia should aim for a convergence between the trend lines for percentage of women among the Ph.D. students and percentage of women among the faculty in similar disciplines. This metric self-corrects for the differing representation of women from discipline to discipline.
- It must be recognized that in a population where women are unevenly distributed, decisions that appear to be gender-neutral may in fact have gender-balance consequences. For example, it seems likely that the shift toward a more fully tenured and less Humanities-rich faculty has slowed Columbia's efforts to achieve a more gender-balanced faculty overall. In the future, the potential gender-balance consequences of any such policy changes should be considered in advance rather than discovered retrospectively.
- Examine possible causes for the persistent 20% gap between the percentage of women among Natural Science undergraduate major/concentrators and the percentage of women among graduate students in the same disciplines. Is this part of a national

pattern, or might it be possible that the Natural Sciences are underrecruiting women for their graduate programs?

3. ATTRITION OF GRADUATE STUDENTS

We examined attrition rate of male versus female Ph.D. students at two points in the pipeline, one year into their graduate studies, and seven years after matriculation.

First year attrition is interesting from both the perspective of cause and potential cure. Students who leave in the first year are probably doing so of their own volition; few departments have an up or out hurdle this early in the graduate student career. Thus first year attrition numbers can be considered a measure of student unhappiness, rather than a measure of student performance. Departments, divisions and GSAS have (or could potentially have) quite a bit of influence over the first year graduate experience, when students tend to follow a somewhat prescribed pathway through orientation activities and coursework. The later part of the graduate experience, after students have dispersed to their individual scholarly endeavors, is much less amenable to any sort of intervention that might be attempted at the department, division, or school level.

Exhibit 11 shows the attrition of doctoral students one year into their graduate studies, as of the fall of 2000. In all divisions, women left the Ph.D. program at rates two or three times larger than their male classmates. Nineteen percent of female Humanities students left the program within one year, 13% of Social Sciences women, and 15% of Natural Sciences women. The comparable figures for men were 7%, 5% and 4%. Across all divisions, the cohort began with a male: female ratio of 192:145, or approximately 4:3. After only one year, 23 women (and 10 men) had left the program and the ratio had deteriorated to 182:122, or approximately 3:2.

By seven years post-matriculation, a student making good progress should have graduated. Thus we took the percentage of students who had matriculated in 1993, but had neither graduated nor registered for further study in the fall of 2000, as an indicator of “ultimate attrition” of Ph.D. students. The class which entered in 1993 was the oldest cohort for which data were available, and the way in which the data were compiled did not allow us to identify whether there might be students who were on formal leave-of-absence, who might complete their Ph.D. eventually. In any case, the available numbers show students who had failed to achieve their original objective of obtaining a Ph.D. in a reasonable length of time (7 years).

Within these caveats, Exhibit 12 indicates the attrition of doctoral students seven years post-matriculation, as of the fall of 2000. Once again, we see a consistent pattern: attrition for women in all divisions was apparently higher than for their male classmates. Forty-six percent of female Humanities students had neither graduated nor re-registered seven years after matriculation, 44% of Social Sciences women, and 33% of Natural Sciences women. The comparable numbers for men were 35%, 39%, and 28%. Across all divisions, the cohort began with a male: female ratio of 207:202, or nearly 1:1. After seven years, 71 men and 86 women had not achieved their objective of obtaining a Ph.D..

We note that the imbalance between male and female attrition rates pertains across all three divisions. Although Natural Sciences, with its smaller percentage of women students and women faculty, has a reputation for being inhospitable to women, the male versus female attrition rates for Natural Science students are not notably worse than for Humanities or Social Sciences.

We considered whether funding status might influence a student's likelihood of dropping out. Exhibit 13 shows the interaction between funding status and attrition rate for the cohort that entered in 1993. In the 1993 Humanities cohort, women were much more likely to be unfunded than men (52% men funded versus 39% women funded), and not surprisingly, unfunded students were much more likely to drop out than funded students. But even when comparing just those Humanities students who did have funding, attrition among female students was much higher than among male students (32% attrition among funded woman versus 19% attrition among funded men). In the 1993 Social Sciences cohort, a higher percentage of women than men were funded. The attrition rate among funded men and women was comparable; the attrition rate among unfunded Social Sciences women was higher than for unfunded Social Sciences men (57% versus 46%). In Natural Sciences nearly all Ph.D. students are funded.

We wished to examine whether women's attrition rates have improved through time, in parallel with women's general advancement throughout society. Unfortunately, the data we had available covered only one snapshot in time, the fall of 2000. From the data in hand, we can say that M/F attrition rates to date in the cohort that entered in the fall of 1999 (Exhibit 11) are even more lopsided than the cohort that entered in 1993 (Exhibit 12). This observation is alarming, but inconclusive, given the differing pressures on first-year versus end-game graduate students, and the changing demographics of the GSAS student body. A far preferable data analysis would be to follow individual cohorts of students longitudinally, graphing and tabulating the number of students remaining registered, graduated, and attrited versus year since matriculation. This approach would allow identification of when pressure point in the pipeline occur, which would be a more informative starting point for a discussion of potential interventions. In addition, this approach would help us understand whether we are making progress as an institution: is there evidence that female students in recently matriculated cohorts are faring better than cohorts from 5 or 10 years ago?

RECOMMENDATIONS CONCERNING GRADUATE STUDENTS

- Extend the study of student attrition to undergraduates, masters students, and professional school students
- Institute exit interviews or questionnaire for students leaving the Ph.D. program. A standard set of questions should be asked, and the data should be tabulated in a way that can be compared across divisions and across cohorts.
- Examine and strengthen the support structure for first-year Ph.D. students, including orientation activities, first year course of study, and the mechanism for matching student with advisor.
- Recompile the data on graduate student attrition into a form that will allow individual entering cohorts to be tracked longitudinally.

- Examine longitudinal data for pressure points: are there points in the student trajectory where attrition of female students preferentially occurs, cohort after cohort?
- Compare longitudinal data across cohorts for evidence of change over time: is there evidence that female students in more recent cohorts are faring better than the cohorts from 5 or 10 years ago?

4. HIRING INTO THE TENURE-ELIGIBLE RANKS

We examine two aspects of hiring into the tenure-eligible ranks: (1) is the influx of new hires into the tenure-eligible ranks working toward better gender balance? And (2) does the selection of new hires favor or disfavor women?

Gender balance of new hires versus existing faculty

Exhibit 14 compares the gender balance of new hires against the gender balance of existing tenure-eligible faculty, by time slice and by division. For any given segment of the university and time slice, if the percentage of women among the new hires is larger than the percentage of women in the existing tenure-eligible faculty, then the new-hire process is, on net, working toward improving the gender balance of the faculty. Integrating across all of Arts & Sciences, the influx of new hires has been very slightly (1–4%) more female-rich than the standing stock since 1993. This average masks a substantial variation from division to division: since 1993, Humanities has consistently brought in a substantially (2–19%) more female-rich group than their standing stock; whereas Natural Sciences has brought in a group of new hires which is less female-rich (by 1–7%) than their standing stock.

It is not obvious at first glance how to reconcile the data in Exhibit 14 with the observation that the percentage of tenure-eligible women has increased substantially in Natural Sciences (Exhibit 9) and hardly budged in Humanities (Exhibit 7). How can Humanities consistently bring in a more female-rich group of new hires than their existing tenure-eligible faculty, and yet not succeed in raising the percentage of women among their tenure-eligible faculty? And how can Natural Sciences consistently bring in a less female-rich group of new hires than their standing stock, and yet achieve a dramatic (Exhibit 9) increase in percentage of women in the tenure-eligible ranks? As illustrated graphically in Exhibit 15, the answer may lie in the fluxes out of the tenure-eligible ranks, by promotion to tenure and by departures from the University. That a male-rich outflux from the tenure-eligible ranks in Natural Sciences could have occurred is supported by the observation (Exhibit 9) that the number of tenure-eligible men in that division decreased from 52 to 49 between 1990 and 2000. That a relatively female-rich outflux from Humanities could have occurred is supported by the observation (Exhibit 7) that the tenure-eligible women in that division decreased by 43% (17 lost out of 40 initially), while the tenure-eligible men decreased by only 39% (20 lost out of 51 initially). Departures from the faculty ranks were not examined in the current study, but must be a priority for the next phase of the project.

Gender balance of new hires versus applicant pool and availability pool

Exhibits 16 and 17 compare the percentage of women among the group of new hires with that of the applicant pool from which they were selected. Looking first at the 1999–2000 time slice

(Exhibit 16 top; Exhibit 17), we see that female applicants have done well in the competition for Columbia tenure-eligible positions. Integrating across Arts & Sciences, a new-hire group comprising 34% women was selected from an applicant pool that was only 23% female. Both Social Sciences and Natural Sciences selected a group of new hires that was more female-rich than the applicant pool.

However, when we compare the percentage of women in the applicant pool with the percentage in the national availability pool (Survey of Earned Doctorates, NSF, 1975–1998), we find that Columbia is attracting less than our share of female applicants. In Natural Sciences, for example, Columbia’s applicant pool in 1999–2000 was less than half as female-rich as the national availability pool (14% versus 39%). In Humanities and Social Sciences the discrepancy was in the same direction, although not as extreme.

This pattern has been amazingly robust over time (Exhibit 16, bottom). In every time slice since 1990, women applicants have been hired into Columbia’s tenure-eligible ranks at rates higher than their representation in the applicant pool. But, at the same time, women have been substantially underrepresented in the applicant pools, relative to the national availability pools.

We considered the possibility that the national availability pool data might not be the appropriate basis for comparison. For example, it was suggested that the highest-quality Ph.D. programs, from which Columbia likes to select its junior faculty, might be less female-rich than the national availability pool. As a proxy for the Ph.D. production rate at Columbia-caliber universities, we considered Columbia’s own Ph.D. production rates (Exhibit 16, table, far right column). The percentage of women among Columbia’s own Ph.D. recipients in the preceding years differs slightly from the national availability pool, but is still substantially higher than in the applicant pools.

There could be many reasons why women are underrepresented in Columbia’s applicant pools. Something about Columbia’s history, location, or reputation could be off-putting to potential applicants. The observation that women are overselected from among the applicant pool could mean that self-selection and/or different recruiting practices have prefiltered out a smaller but higher-caliber group of female applicants than male applicants. Columbia’s true availability pool could differ from the national availability pool, for example, by being more international or more geographically mobile. Developing and testing hypotheses about the apparent discrepancy between the availability pool and the applicant pool should be a priority for the next phase of the pipeline study. Fruitful lines of inquiry would be to compare Columbia’s statistics with those for other elite, international Universities, to compare Columbia’s statistics against those for other New York City universities, to record and examine the point of initial contact for applicants (advertisement, professional society meeting, personal contact through a faculty member at student’s university, etc.), and to dig deeper into the meaning of the “national availability pools.”

5. ENTRY INTO THE TENURED RANKS

With respect to entry into the tenured ranks, we consider three pathways of entry: internal promotion through the tenure review process, external hire through competitive selection, and “target of opportunity” hiring. “Targets of Opportunity” are identified as external hires for which the applicant pool, as reported to the Affirmative Action Office, comprises one person.

Concerning internal promotions, we would like to be able to ask: are male and female candidates equally likely to be successful in the promotion-to-tenure process? A subcommittee of the Provost’s Salary Equity Committee was charged with tackling this complex question, and therefore it was excluded from the scope of this CSW Pipeline Study. We urge that the promotion study be updated with accepted and transparent methodology, and that the methodology, results, and supporting data be disseminated to the University community.

The data available to us do permit us to ask a simpler question: is the promotion-to-tenure process, on net, serving to bring the gender ratio of the tenured faculty more nearly into balance? Exhibits 18 and 19 show that the answer is yes. For all of the Arts & Sciences, and for each division considered individually, the flux of new blood entering the tenured ranks via internal promotion is more female-rich than that of the standing stock of existing tenured faculty.

A similar comparison can be made for external hires (Exhibits 18 and 19). Here the picture is mixed. In the Humanities, external hires and promotees have both been 40% female, much higher than the ratio within the existing tenured faculty. But in Social Sciences and Natural Sciences, the percentage of females among the external hires is substantially lower than among the promotees, and the external hires have not helped the gender balance. This is an important point, because fully half of the new appointments in Columbia’s tenured ranks arrive through external hire rather than through promotion (88 promotees versus 87 external hires between 1990 and 2000 across all of the Arts & Sciences). A particularly egregious data point concerns “target of opportunity” hires in Natural Sciences (Exhibit 18, lower right): eleven natural scientists were hired into the tenured ranks without competitive searches, and not a single one of them was female.

A complete picture of the fluxes and populations of male and female faculty should include fluxes out as well as in (Exhibit 19, bottom), i.e., retirements and departures from the University. Given the relatively recent entry of substantial numbers of women into many academic disciplines, the outflux due to retirement is probably more male-rich than the tenured population as a whole. The outflux through departures to other universities at the tenured level could also plausibly be more male-rich; this hasn’t yet been studied. Male-rich outfluxes from a male-rich population will tend to drive the population toward a more even gender ratio, and this process could explain some fraction of the progress toward an increasing percentage of women in the tenured faculty (Exhibit 6).

RECOMMENDATIONS CONCERNING THE FACULTY PIPELINE

- Extend the faculty pipeline study to the professional schools
- Develop and test hypotheses concerning low representation of women in Columbia's tenure-eligible applicant pools: comparison with other elite universities, other NYC universities, etc.
- Recruit women proactively for tenure-eligible positions. Scrutinize the makeup of each applicant pool, as well as consider whether women *in* the applicant pool were fairly considered.
- Update the study of the success rate of male and female candidates for promotion to tenure, with accepted methodology, and disseminate the methodology, results, and supporting data to the University community.
- Scrutinize every external hire into a tenured position, especially in the Social Sciences and Natural Sciences, seeking to improve upon the record of the last decade in which external hires had a gender balance only half as female-rich as internal promotions in these divisions.
- Investigate the gender balance of fluxes out of the faculty: by retirement, death, and for other jobs, at tenured and tenure-eligible levels.

6. THE IMPORTANCE OF MICROCLIMATES

School-wide trends, or even trends by division, mask significant department-to-department variation. It is within individual departments that hiring decisions originate, and where women and men have the majority of their day-to-day interactions. Some microclimates are more or less chilly for females, both students and faculty.

Exhibit 20 is an example of a large department that has made negative progress toward achieving gender balance over the last decade. In this department, the number of tenured women, the number of tenure-eligible women, the percentage of tenured women, and the percentage of tenure-eligible women, all dropped between 1990 and 2000. What would a reasonable percentage of women in this department be? Is it possible that this department already had achieved a good gender balance back in 1990 and is now fluctuating about an appropriate plateau? No. Exhibit 21 demonstrates that both the graduate student body and undergraduate major/concentrators have been maintaining at approximately 60% female in this department for a decade or longer, while the percentage of women in the tenured faculty of this department has remained stuck at less than half that.

Exhibits 22 and 23, in contrast, portray an example of a department of similar size that has made positive net progress over the last decade, increasing both number and percentage of women among both the tenure-eligible and tenured faculty. The gap between percentage of women in the tenure-eligible faculty and percentage of women in the student body has collapsed over the last few years.

In light of our earlier finding on the relationship between gender balance and growth rate, it may not be coincidence that the department in the first example decreased in size over the study period,

while the department in the second example achieved its improvements in the representation of women during 1996–2000, a period of growth in departmental size.

Exhibit 24 lists departments that made substantial progress on improving the representation of women in their tenured and tenure-eligible ranks between 1990 and 2000—and departments that did not. The majority of Arts & Sciences departments are somewhere in the middle, with either little change or a mixed message. This could mean a department that has had no hiring opportunities—or a department which has failed to take advantage of the growing availability of women in its field. Graphs and tables such as Exhibits 20–23 for all of the A&S departments are forthcoming on the World Wide Web at www.columbia.edu/cu/senate.

RECOMMENDATIONS CONCERNING MICROCLIMATES

- Disseminate the department-by-department data on faculty and student gender balance over time, 1990–2000, to allow individual departments to evaluate their own standing and progress.
- In allocating new faculty lines, the administration and the favored departments/divisions must realize that the opportunity to achieve gender balance for the entire University lies preferentially with departments that are growing. These opportunities cannot be allowed to be squandered.
- Conversely, when it is considered necessary to reduce the faculty size in a given department or division, precautions should be taken to ensure that this shrinkage does not occur by differential elimination of females.

7. SUMMARY OF RECOMMENDATIONS

We conclude by summarizing all of the recommendations coming forward from our study, both for actions and policies and for further study.

RECOMMENDATIONS FOR ACTIONS AND POLICIES

- As a target for monitoring progress toward achieving gender balance among the faculty, Columbia should aim for a convergence between the trend lines for percentage of women among the Ph.D. students and percentage of women among the faculty in similar disciplines. This metric self-corrects for the differing representation of women from discipline to discipline.
- Recognize that in a population where women are unevenly distributed, decisions that appear to be gender-neutral may in fact have gender-balance consequences. In the future, the potential gender-balance consequences of any such policy changes should be considered in advance rather than discovered in retrospect.
- Institute exit interviews or questionnaire for students leaving the Ph.D. program. A standard set of questions should be asked, and the data should be tabulated in a way that can be compared across divisions and across cohorts.

- Examine and strengthen the support structure for first-year Ph.D. students, including orientation activities, first year course of study, and the mechanism for matching student with advisor.
- Recruit women proactively for tenure-eligible positions. Scrutinize the makeup of each applicant pool, as well as consider whether women *in* the applicant pool were fairly considered.
- Scrutinize every external hire into a tenured position, especially in the Social Sciences and Natural Sciences, seeking to improve upon the record of the last decade, in which external hires had a gender balance only half as female-rich as did internal promotions in these divisions.
- Disseminate the department-by-department data on faculty and student gender balance over time, 1990–2000, to allow individual departments to evaluate their own standing and progress.
- In allocating new faculty lines, the administration and the favored departments/divisions must realize that the opportunity to achieve gender balance for the entire University lies preferentially with departments that are growing. These opportunities cannot be allowed to be squandered.
- Conversely, when it is considered necessary to reduce the faculty size in a given department or division, precautions should be taken to ensure that this shrinkage does not occur by differential elimination of females.

RECOMMENDATIONS FOR CONTINUED STUDY

- Examine possible causes for the persistent 20% gap between the percentage of women among Natural Science undergraduate major/concentrators and the percentage of women among graduate students in the same disciplines. Is this part of a national pattern, or might it be possible that Columbia's Natural Sciences are underrecruiting women for their graduate programs?
- Extend the study of student attrition to undergraduates, masters students, and professional school students.
- Recompile the data on graduate student attrition into a form that will allow individual entering cohorts to be tracked longitudinally. Examine longitudinal data for pressure points: are there points in the student trajectory where attrition of female students preferentially occurs, cohort after cohort? Compare longitudinal data across cohorts for evidence of change over time: is there evidence that female students in more recent cohorts are faring better than the cohorts from 5 or 10 years ago?
- Extend the faculty pipeline study to the professional schools.
- Develop and test hypotheses concerning low representation of women in Columbia's tenure-eligible applicant pools: comparison with other elite universities, other NYC universities, etc.
- Update the study of the success rate of male and female candidates for promotion to tenure (previously performed by the Committee on Salary Equity), and disseminate the methodology, results, and supporting data to the University community.

- Investigate the gender balance of fluxes out of the faculty: by retirement, death, and for other jobs, at tenured and tenure-eligible levels.

ADDITIONAL AREAS RECOMMENDED FOR STUDY

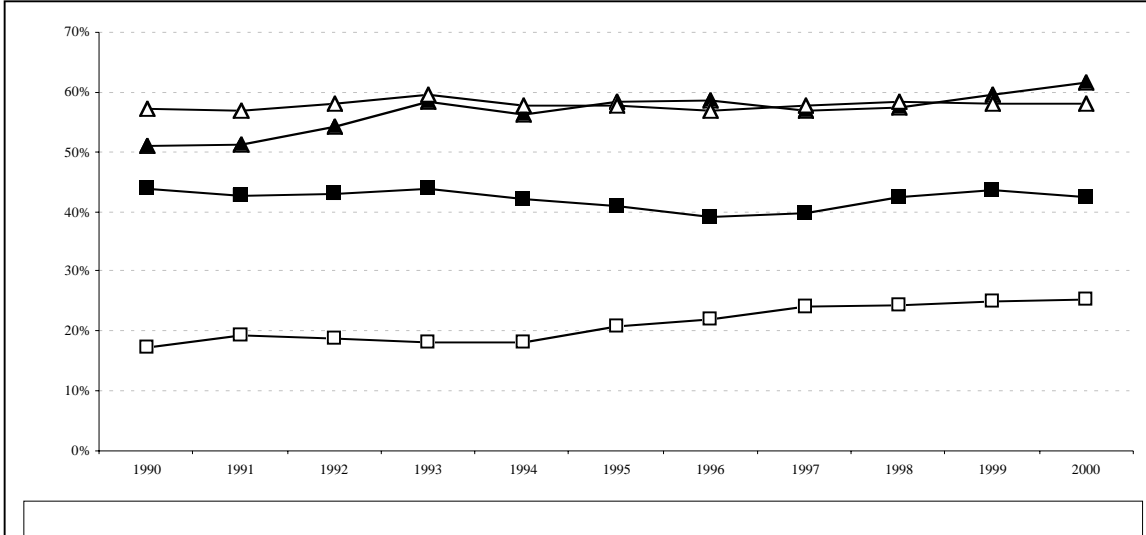
- Examine gender equity in non-salary benefits and supports provided by the University and its subsidiary parts.
- Examine gender equity in allocation of faculty workload.

Exhibit 1: Definitions of GSAS Divisions

Humanities	Social Sciences	Natural Sciences
<ul style="list-style-type: none"> • Art History & Archaeology • Classics • East Asian Languages & Cultures • English & Comparative Literature • French & Romance Philology • Germanic Languages • Italian • Middle East & Asian Languages & Cultures • Music • Philosophy • Religion • Slavic Languages • Spanish & Portuguese 	<ul style="list-style-type: none"> • Anthropology • Economics • History • International & Public Affairs • Political Science • Sociology 	<ul style="list-style-type: none"> • Astronomy • Biology • Chemistry • Earth & Environmental Sciences • Mathematics • Physics • Psychology • Statistics

Exhibit 2

Humanities, 1990-2000
COMPARISON OF THE PERCENTAGE OF WOMEN STUDENT MAJORS
AND FULL-TIME INSTRUCTIONAL WOMEN FACULTY
 Undergraduate Majors & Concentrators and Ph.D. Graduate Students; Tenured and Tenure-Eligible Faculty



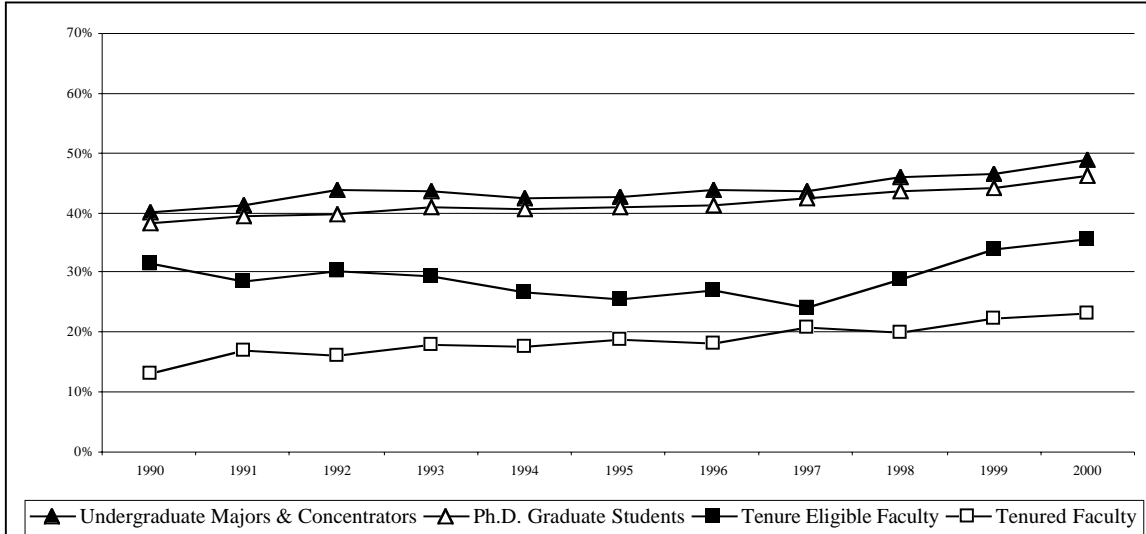
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Undergraduate Majors & Concentrators											
Women	372	366	318	327	384	414	430	412	450	462	478
Men	356	346	267	232	297	294	302	312	333	314	296
Total N	728	712	585	559	681	708	732	724	783	776	774
% Women	51.1%	51.4%	54.4%	58.5%	56.4%	58.5%	58.7%	56.9%	57.5%	59.5%	61.8%
Ph.D. Graduate Students											
Women	693	668	679	675	641	626	608	605	604	567	551
Men	519	504	486	459	466	456	456	439	427	407	398
Total N	1212	1172	1165	1134	1107	1082	1064	1044	1031	974	949
% Women	57.2%	57.0%	58.3%	59.5%	57.9%	57.9%	57.1%	58.0%	58.6%	58.2%	58.1%
Tenure-Eligible Faculty											
Women	40	35	35	33	30	27	24	24	23	24	23
Men	51	47	46	42	41	39	37	36	31	31	31
Total N	91	82	81	75	71	66	61	60	54	55	54
% Women	44.0%	42.7%	43.2%	44.0%	42.3%	40.9%	39.3%	40.0%	42.6%	43.6%	42.6%
Tenured Faculty											
Women	19	21	20	21	20	24	27	28	30	31	31
Men	90	87	86	93	90	90	95	88	92	92	91
Total N	109	108	106	114	110	114	122	116	122	123	122
% Women	17.4%	19.4%	18.9%	18.4%	18.2%	21.1%	22.1%	24.1%	24.6%	25.2%	25.4%

Notes: Undergraduates included are those students who have declared a major or concentration, usually juniors and seniors. Graduate Students includes students in registered in non-terminal M.A./M.S. and in Ph.D. programs. Tenure Eligible Faculty include Instructors, Assistant Professors, and Associate Professors without Tenure. Tenured Faculty include Associate Professors with Tenure and Full Professors. Adjunct or Visiting Faculty and Professors without Tenure are not included.

Sources: Student data are from the Student Information System (SIS). Faculty data are from the Office of the Vice Provost for Academic Administration.

Exhibit 3

Social Sciences, 1990-2000
**COMPARISON OF THE PERCENTAGE OF WOMEN STUDENT MAJORS
 AND FULL-TIME INSTRUCTIONAL WOMEN FACULTY**
 Undergraduate Majors & Concentrators and Ph.D. Graduate Students; Tenured and Tenure-Eligible Faculty



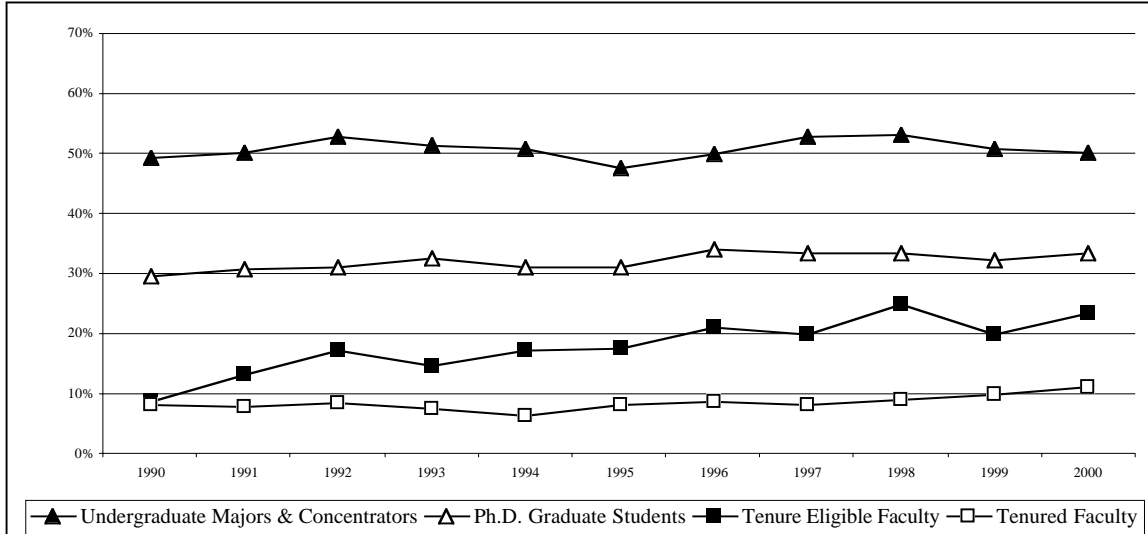
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Undergraduate Majors & Concentrators											
Women	335	369	375	360	369	412	447	413	448	521	547
Men	501	523	476	462	496	550	567	530	525	593	571
Total N	836	892	851	822	865	962	1014	943	973	1114	1118
% Women	40.1%	41.4%	44.1%	43.8%	42.7%	42.8%	44.1%	43.8%	46.0%	46.8%	48.9%
Ph.D. Graduate Students											
Women	396	403	409	407	403	405	389	396	404	394	386
Men	637	615	613	585	584	578	554	532	518	498	448
Total N	1033	1018	1022	992	987	983	943	928	922	892	834
% Women	38.3%	39.6%	40.0%	41.0%	40.8%	41.2%	41.3%	42.7%	43.8%	44.2%	46.3%
Tenure-Eligible Faculty											
Women	19	16	17	20	18	16	18	14	17	19	20
Men	41	40	39	48	49	46	48	44	42	37	36
Total N	60	56	56	68	67	62	66	58	59	56	56
% Women	31.7%	28.6%	30.4%	29.4%	26.9%	25.8%	27.3%	24.1%	28.8%	33.9%	35.7%
Tenured Faculty											
Women	12	15	14	16	16	17	16	18	19	23	24
Men	78	73	72	73	74	73	72	68	76	80	79
Total N	90	88	86	89	90	90	88	86	95	103	103
% Women	13.3%	17.0%	16.3%	18.0%	17.8%	18.9%	18.2%	20.9%	20.0%	22.3%	23.3%

Notes: Undergraduates included are those students who have declared a major or concentration, usually juniors and seniors. Graduate Students includes students in registered in non-terminal M.A./M.S. and in Ph.D. programs. Tenure Eligible Faculty include Instructors, Assistant Professors, and Associate Professors without Tenure. Tenured Faculty include Associate Professors with Tenure and Full Professors. Adjunct or Visiting Faculty and Professors without Tenure are not included.

Sources: Student data are from the Student Information System (SIS). Faculty data are from the Office of the Vice Provost for Academic Administration.

Exhibit 4

Natural Sciences, 1990-2000
**COMPARISON OF THE PERCENTAGE OF WOMEN STUDENT MAJORS
 AND FULL-TIME INSTRUCTIONAL WOMEN FACULTY**
 Undergraduate Majors & Concentrators and Ph.D. Graduate Students; Tenured and Tenure-Eligible Faculty



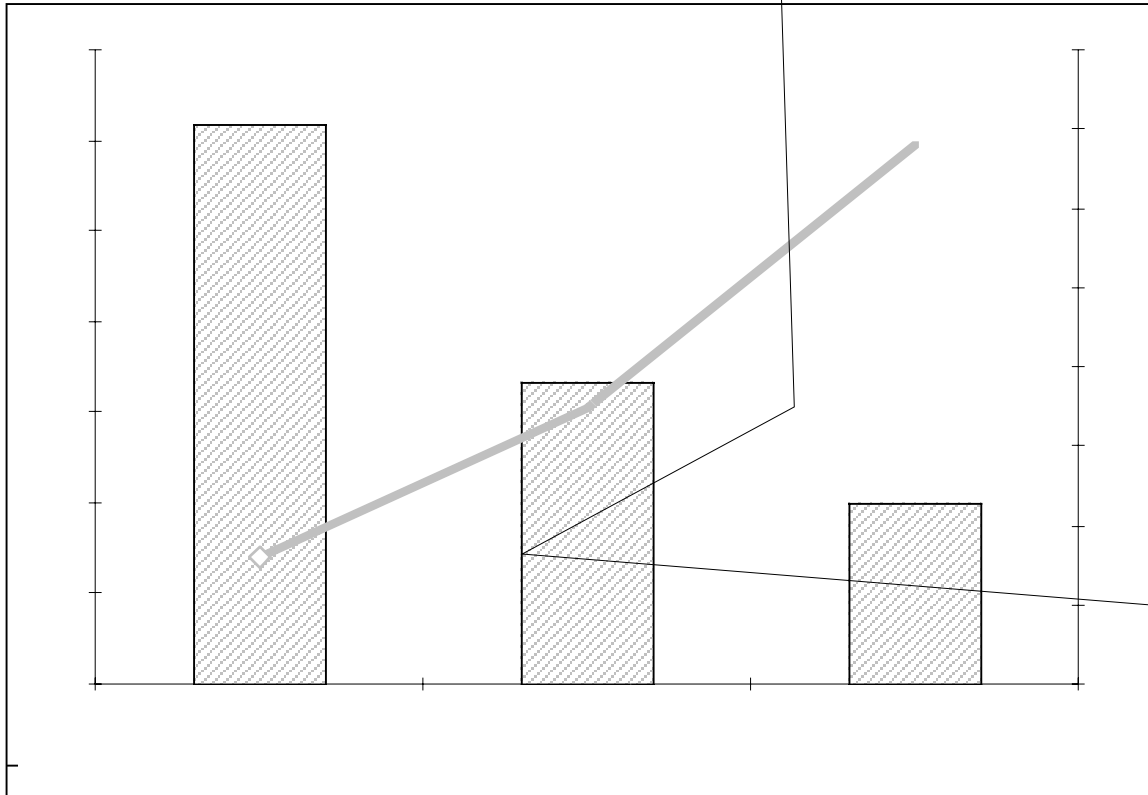
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Undergraduate Majors & Concentrators											
Women	135	147	155	156	189	196	217	248	265	261	258
Men	138	146	138	147	183	216	218	220	234	251	255
Total N	273	293	293	303	372	412	435	468	499	512	513
% Women	49.5%	50.2%	52.9%	51.5%	50.8%	47.6%	49.9%	53.0%	53.1%	51.0%	50.3%
Ph.D. Graduate Students											
Women	153	156	157	171	164	153	160	154	155	155	170
Men	363	349	346	352	364	339	307	307	309	326	339
Total N	516	505	503	523	528	492	467	461	464	481	509
% Women	29.7%	30.9%	31.2%	32.7%	31.1%	31.1%	34.3%	33.4%	33.4%	32.2%	33.4%
Tenure-Eligible Faculty											
Women	5	7	9	8	9	8	11	11	13	11	15
Men	52	46	43	46	43	37	41	44	39	44	49
Total N	57	53	52	54	52	45	52	55	52	55	64
% Women	8.8%	13.2%	17.3%	14.8%	17.3%	17.8%	21.2%	20.0%	25.0%	20.0%	23.4%
Tenured Faculty											
Women	8	8	8	7	6	8	9	9	10	11	13
Men	88	92	87	85	85	89	94	99	101	99	103
Total N	96	100	95	92	91	97	103	108	111	110	116
% Women	8.3%	8.0%	8.4%	7.6%	6.6%	8.2%	8.7%	8.3%	9.0%	10.0%	11.2%

Notes: Undergraduates included are those students who have declared a major or concentration, usually juniors and seniors. Graduate Students includes students in registered in non-terminal M.A./M.S. and in Ph.D. programs. Tenure Eligible Faculty include Instructors, Assistant Professors, and Associate Professors without Tenure. Tenured Faculty include Associate Professors with Tenure and Full Professors. Adjunct or Visiting Faculty and Professors without Tenure are not included.

Sources: Student data are from the Decision Support System (DSS). Faculty data are from the Office of the Vice Provost for Academic Administration.

Exhibit 5

Arts & Sciences
PERCENTAGE OF WOMEN FACULTY BY TENURE STATUS
 Regular Fulltime Instructional Faculty
 2000



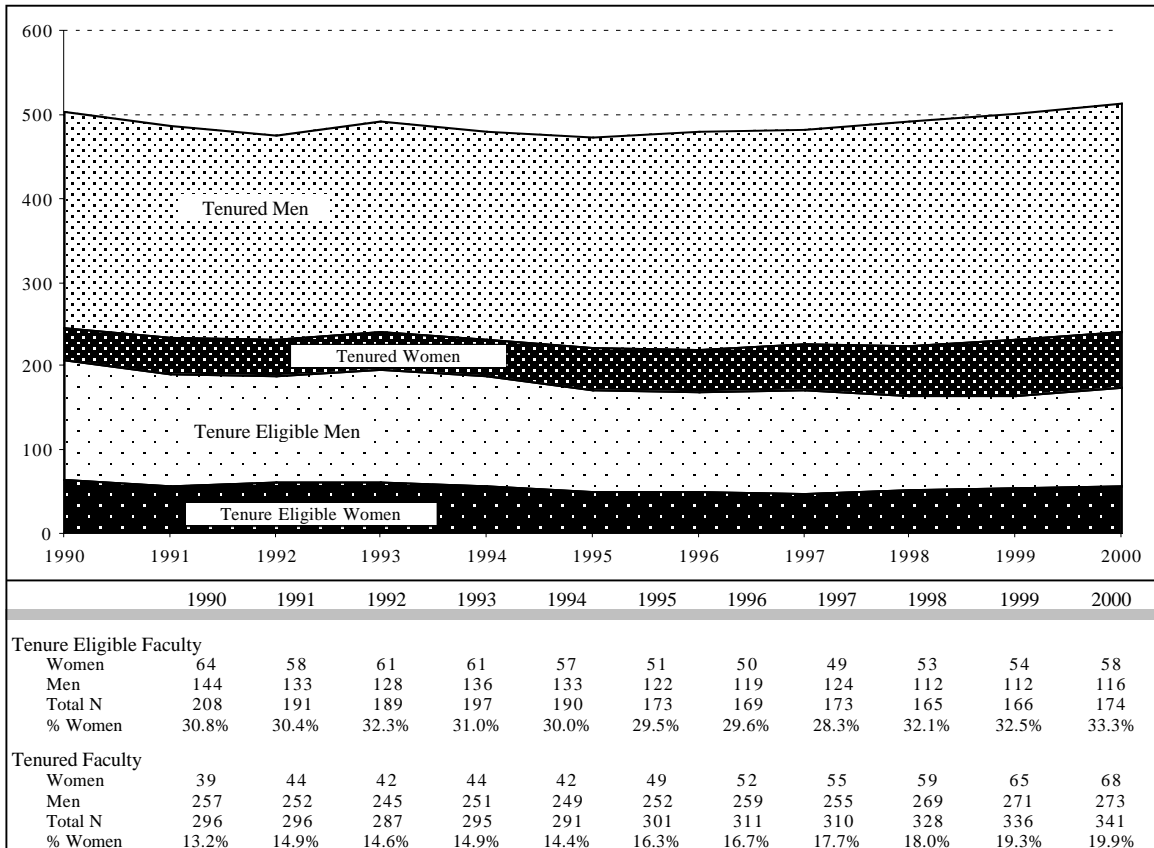
	Women	Men	Total	% Women
Lecturer and Associate	50	31	81	61.7%
Instructor & Assistant Professor	48	89	137	35.0%
Associate Professor w/o Tenure	10	27	37	27.0%
Associate Professor with Tenure	18	31	49	36.7%
Professor	50	242	292	17.1%
Tenure Eligible	58	116	174	33.3%
Tenured	68	273	341	19.9%
Total Number of Faculty	176	420	596	29.5%

Notes: Lecturer and Associate includes Associate, Associate in Language, Associate in Music, Lecturer, Lecturer in Language, Lecturer 2, Senior Lecturer, Senior Lecturer in Language.

Source: Office of the Vice Provost for Academic Administration.

Exhibit 6

Arts & Sciences DISTRIBUTION OF REGULAR FULL-TIME INSTRUCTIONAL FACULTY BY GENDER AND TENURE STATUS 1990-2000

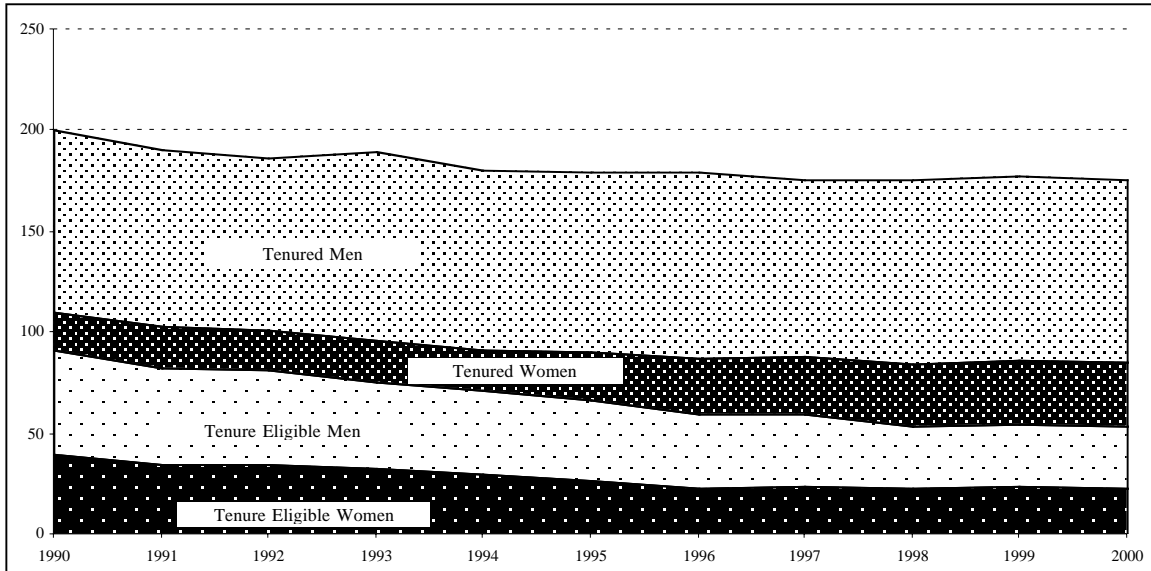


Notes: Tenure Eligible Faculty include Instructors, Assistant Professors, and Associate Professors without Tenure.
Tenured Faculty include Associate Professors with Tenure and Full Professors. Adjunct or Visiting Faculty and Professors without Tenure are not included.

Source: Office of the Vice Provost for Academic Administration.

Exhibit 7

Humanities
**DISTRIBUTION OF REGULAR FULL-TIME INSTRUCTIONAL FACULTY
 BY GENDER AND TENURE STATUS**
 1990-2000



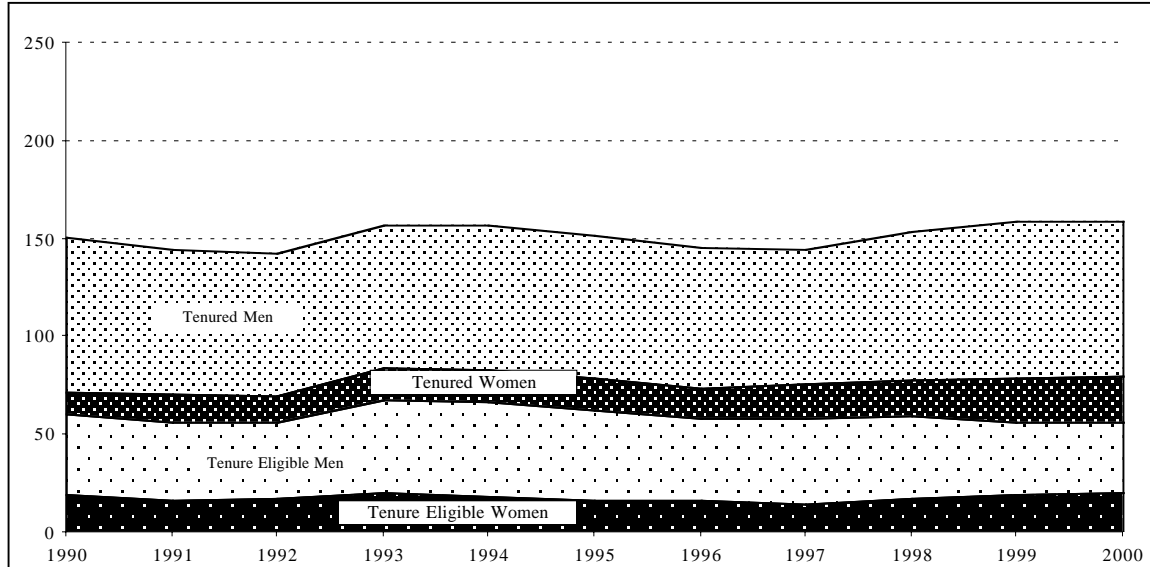
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Tenure Eligible Faculty											
Women	40	35	35	33	30	27	23	24	23	24	23
Men	51	47	46	42	41	39	37	36	31	31	31
Total N	91	82	81	75	71	66	60	60	54	55	54
% Women	44.0%	42.7%	43.2%	44.0%	42.3%	40.9%	38.3%	40.0%	42.6%	43.6%	42.6%
Tenured Faculty											
Women	19	21	20	21	20	24	27	28	30	31	31
Men	90	87	86	93	90	90	93	88	92	92	91
Total N	109	108	106	114	110	114	120	116	122	123	122
% Women	17.4%	19.4%	18.9%	18.4%	18.2%	21.1%	22.5%	24.1%	24.6%	25.2%	25.4%

Notes: Tenure Eligible Faculty include Instructors, Assistant Professors, and Associate Professors without Tenure.
 Tenured Faculty include Associate Professors with Tenure and Full Professors. Adjunct or Visiting Faculty and Professors without Tenure are not included.

Source: Office of the Vice Provost for Academic Administration.

Exhibit 8

Social Sciences
**DISTRIBUTION OF REGULAR FULL-TIME INSTRUCTIONAL FACULTY
 BY GENDER AND TENURE STATUS
 1990-2000**



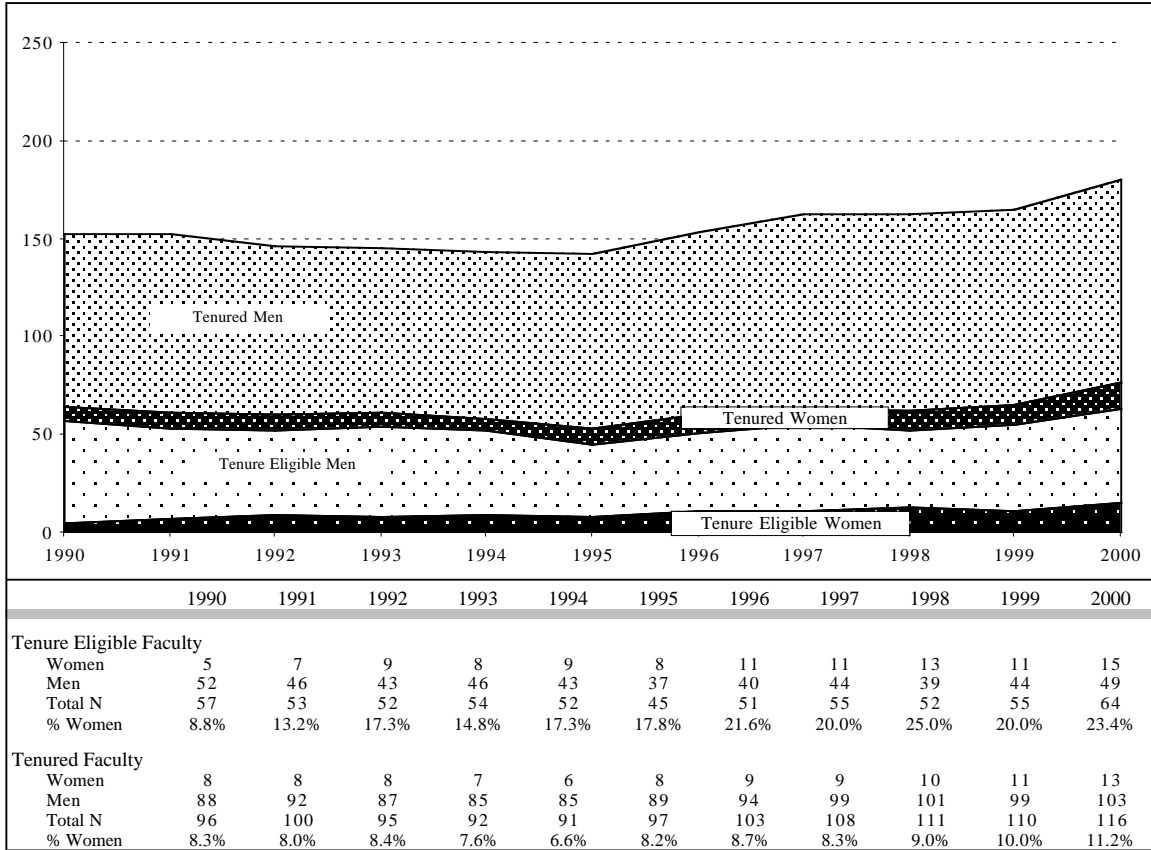
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Tenure Eligible Faculty											
Women	19	16	17	20	18	16	16	14	17	19	20
Men	41	40	39	48	49	46	42	44	42	37	36
Total N	60	56	56	68	67	62	58	58	59	56	56
% Women	31.7%	28.6%	30.4%	29.4%	26.9%	25.8%	27.6%	24.1%	28.8%	33.9%	35.7%
Tenured Faculty											
Women	12	15	14	16	16	17	16	18	19	23	24
Men	79	73	72	73	74	73	72	68	76	80	79
Total N	91	88	86	89	90	90	88	86	95	103	103
% Women	13.2%	17.0%	16.3%	18.0%	17.8%	18.9%	18.2%	20.9%	20.0%	22.3%	23.3%

Notes: Tenure Eligible Faculty include Instructors, Assistant Professors, and Associate Professors without Tenure.
 Tenured Faculty include Associate Professors with Tenure and Full Professors. Adjunct or Visiting Faculty and Professors without Tenure are not included.

Source: Office of the Vice Provost for Academic Administration.

Exhibit 9

Natural Sciences
**DISTRIBUTION OF REGULAR FULL-TIME INSTRUCTIONAL FACULTY
 BY GENDER AND TENURE STATUS**
 1990-2000



Notes: Tenure Eligible Faculty include Instructors, Assistant Professors, and Associate Professors without Tenure.
 Tenured Faculty include Associate Professors with Tenure and Full Professors. Adjunct or Visiting Faculty and Professors without Tenure are not included.

Source: Office of the Vice Provost for Academic Administration.

Exhibit 10

Gap between Percentage of Women in PhD Student Body and
Percentage of Women in Faculty

	Tenure-Eligible		Tenured	
	1990	2000	1990	2000
Total Arts & Sciences	14% (45% v 31%)	15% (48% v 33%)	32% (45% v 13%)	28% (48% v 20%)
Humanities	13% (57% v 44%)	15% (58% v 43%)	40% (57% v 17%)	33% (58% v 25%)
Social Sciences	6% (38% v 32%)	10% (46% v 36%)	25% (38% v 13%)	23% (46% v 23%)
Natural Sciences	21% (30% v 9%)	10% (33% v 23%)	22% (30% v 8%)	22% (33% v 11%)

Exhibit 11
 First Year Attrition of Doctoral Students
 (Students who entered fall of 1999; Status as of fall 2000)

Humanities

	Women	Men
# entered	59	54
# attrition	11	4
% attrition	19%	7%

Social Sciences

	Women	Men
# entered	52	59
# attrition	7	3
% attrition	13%	5%

Natural Sciences

	Women	Men
# entered	34	79
# attrition	5	3
% attrition	15%	4%

All Divisions

	Women	Men
# entered	145	192
# attrition	23	10
% attrition	16%	5%

Exhibit 12
 Ultimate Attrition of Doctoral Students
 (Students who entered fall of 1993; Status as of fall 2000)

Humanities

	Women	Men
# entered	96	60
# attrition*	44	21
% attrition	46%	35%

Social Sciences

	Women	Men
# entered	66	82
# attrition*	29	32
% attrition	44%	39%

Natural Sciences

	Women	Men
# entered	40	65
# attrition*	13	18
% attrition	33%	28%

All Divisions

	Women	Men
# entered	202	207
# attrition*	86	71
% attrition	43%	34%

* students neither graduated nor registered, seven years post-matriculation

Exhibit 13
 Influence of Funding Status on Attrition
 (Students who entered fall of 1993; Status as of fall 2000)

Humanities

	Women	Men
# entered	96	60
# funded	37	31
% funded	39%	52%
% attrition* among funded students	32%	19%
% attrition* among unfunded students	54%	52%

Social Sciences

	Women	Men
# entered	66	82
# funded	29	28
% funded	44%	34%
% attrition* among funded students	28%	25%
% attrition* among unfunded students	57%	46%

* students neither graduated nor registered, seven years post-matriculation

(Natural Sciences not shown because almost all students are funded.)

Exhibit 14
Percent Women among New Hires for Tenure-eligible Ranks

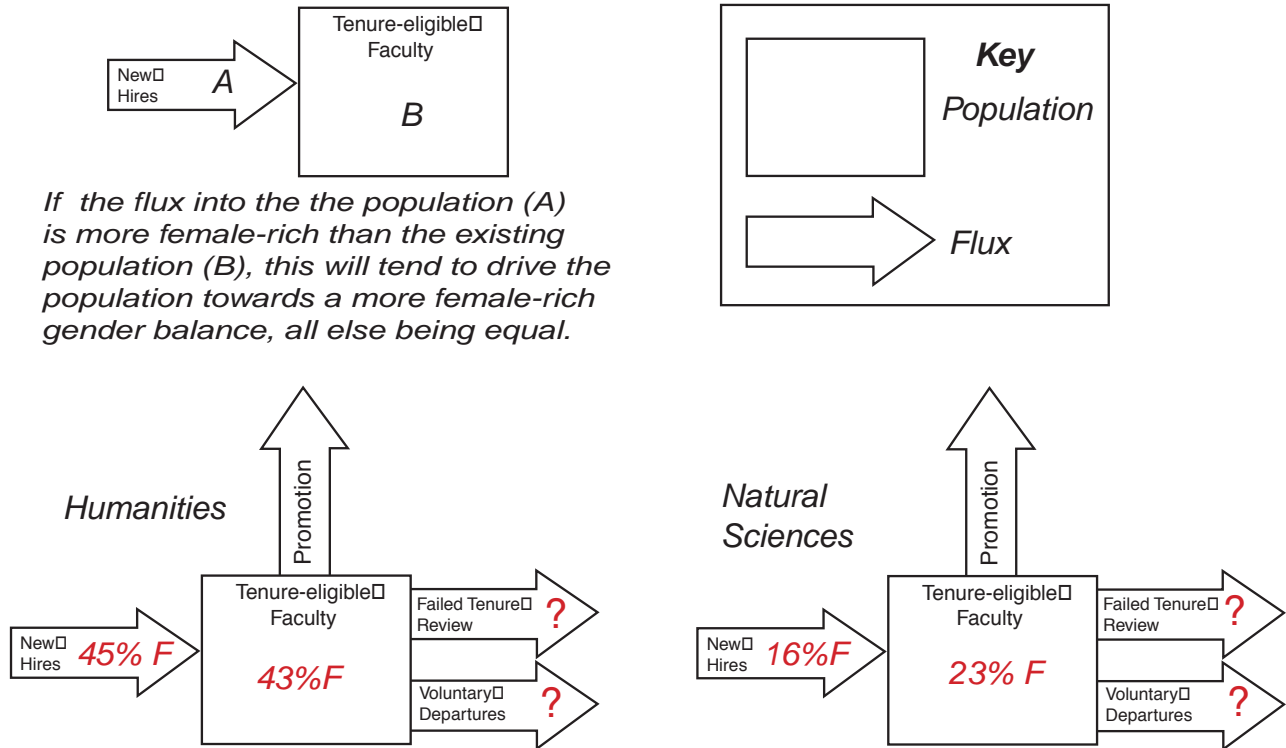
For any given segment of the University, during any given timeslice, if the percentage of women among the new hires exceeds the percentage of women among the existing faculty (the “standing stock”), then this will tend, all else being equal, to drive the gender balance among the faculty towards a more female-rich mixture. Italicized numbers show when this situation has occurred.

	1999-2000		1996-1998	
	Existing Tenure-Eligible Faculty*	New Hires	Existing Tenure-Eligible Faculty*	New Hires
Total Arts & Sciences	33%	<i>34%</i>	28%	<i>32%</i>
Humanities	43%	<i>45%</i>	40%	<i>46%</i>
Social Sciences	36%	<i>48%</i>	24%	<i>32%</i>
Natural Sciences	23%	16%	20%	19%

	1993-1995		1990-1992	
	Existing Tenure-Eligible Faculty*	New Hires	Existing Tenure-Eligible Faculty*	New Hires
Total Arts & Sciences	30%	<i>31%</i>	30%	<i>29%</i>
Humanities	42%	<i>63%</i>	43%	<i>37%</i>
Social Sciences	27%	<i>25%</i>	29%	<i>31%</i>
Natural Sciences	17%	11%	13%	<i>16%</i>

* “Existing” tenure-eligible faculty was taken as 2000 for the 1999-2000 time slice, as 1997 for the 1996-1998 time slice, as 1994 for the 1993-1995 time slice, and as 1991 for the 1990-1992 timeslice.

Exhibit 15



If the flux into the the population (A) is more female-rich than the existing population (B), this will tend to drive the population towards a more female-rich gender balance, all else being equal.

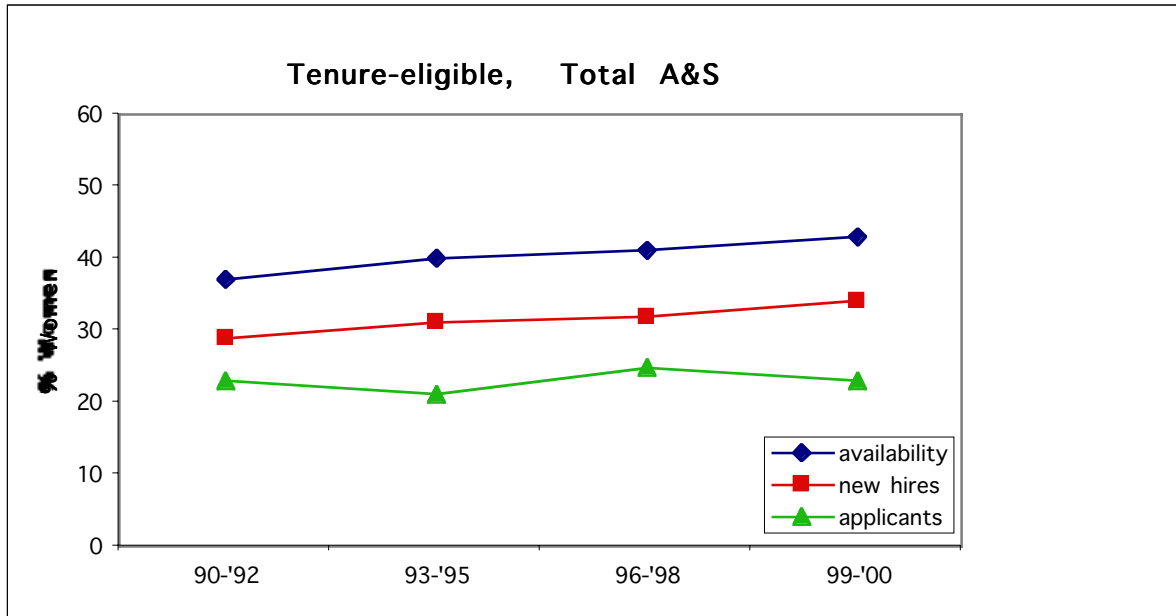
Exhibit 15: (upper right) In this and the following flowchart diagrams, a rectangle represents a “stock” or population of people, and an arrow represents a flux of people into or out of the population. (upper left) If the flux of people into the stock has a higher percentage of women than the existing population, that will tend to drive the population towards a more female-rich gender balance. (bottom) Paradoxically, the flux of new hires into the Humanities tenure-eligible faculty has been more female-rich than the existing population, but the population has not become more female-rich. The flux of new hires into the Natural Sciences tenure-eligible faculty has been less female-rich than the existing population, but the percentage of tenure-eligible women has increased in that division. Numbers shown are for 1999-2000, but a similar paradox has existed since 1993 (compare Exhibit 14). We hypothesize that the paradox may be resolvable through examination of the fluxes out of the populations, by promotion and departures from the University.

Exhibit 16

New Hires versus Applicant & Availability Pools
for Tenure-eligible Ranks
(1999-2000)

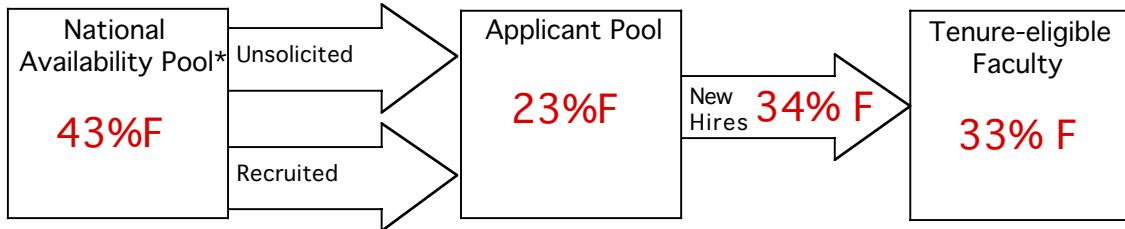
	% Women among					Columbia PhD's granted (‘97-’00)
	Current Ten-El. Faculty	New Hires	Applicant Pool	National Availability Pool		
Total Arts & Sciences	33%	34% >	23% <	43%		42%
Humanities	43%	45% <	48% <	51%		56%
Social Sciences	36%	48% >	31% <	42%		38%
Natural Sciences	23%	16% >	14% <	39%		32%

For the last decade, Columbia has consistently hired women into the tenure-eligible ranks at a rate higher than their proportion in the applicant pool. However, compared to the national availability pools, women have been consistently underrepresented in the applicant pools.

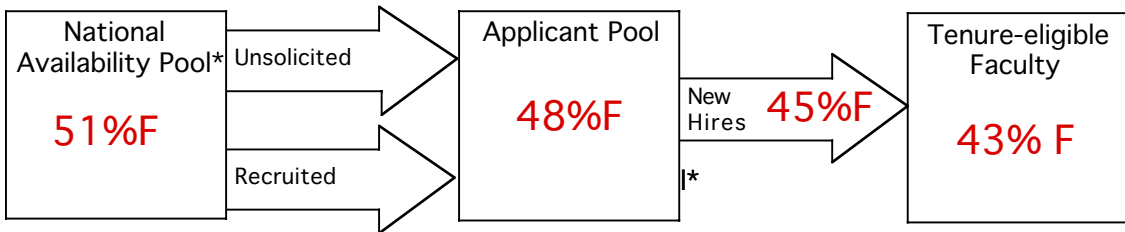


Flux of Women into the Tenure-eligible Ranks (1999-2000)

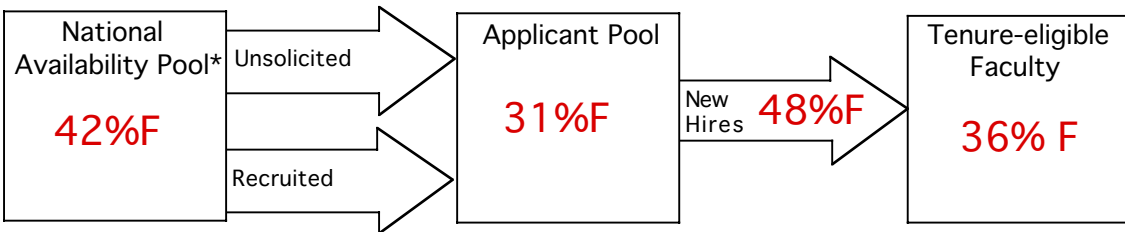
All Arts & Sciences



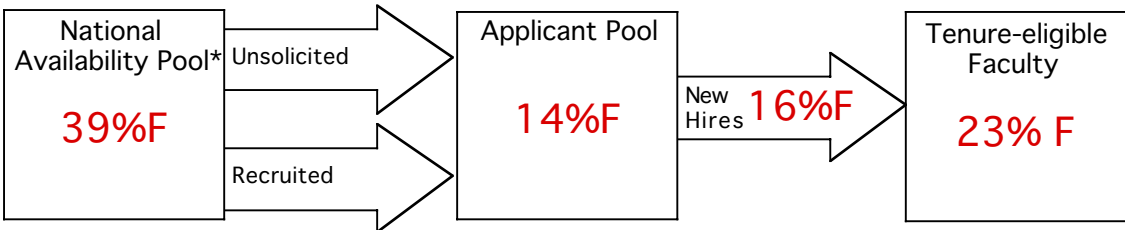
Humanities



Social Sciences



Natural Sciences



* Received PhD one to three years earlier

Exhibit 18

Entry to the Tenured Ranks
1990 – 2000

	Women/Total			
	Existing Tenured Faculty	Internal Promotions (1990-2000)	External Hires (1990-2000)	Targets* of Opportunity (1990-2000)
Total Arts & Sciences	1990: 13% 2000: 20%	33% (29/88)	22% (19/87)	27% (8/30)
Humanities	1990: 17% 2000: 25%	40% (15/38)	40% (10/25)	50% (5/10)
Social Sciences	1990: 13% 2000: 23%	40% (10/25)	19% (7/36)	33% (3/9)
Natural Sciences	1990: 8% 2000: 11%	16% (4/25)	8% (2/26)	0% (0/11)

* Applicant pool of one person, in Affirmative Action records

Exhibit 19
Entry into Tenured Ranks
 (1990 - 2000)

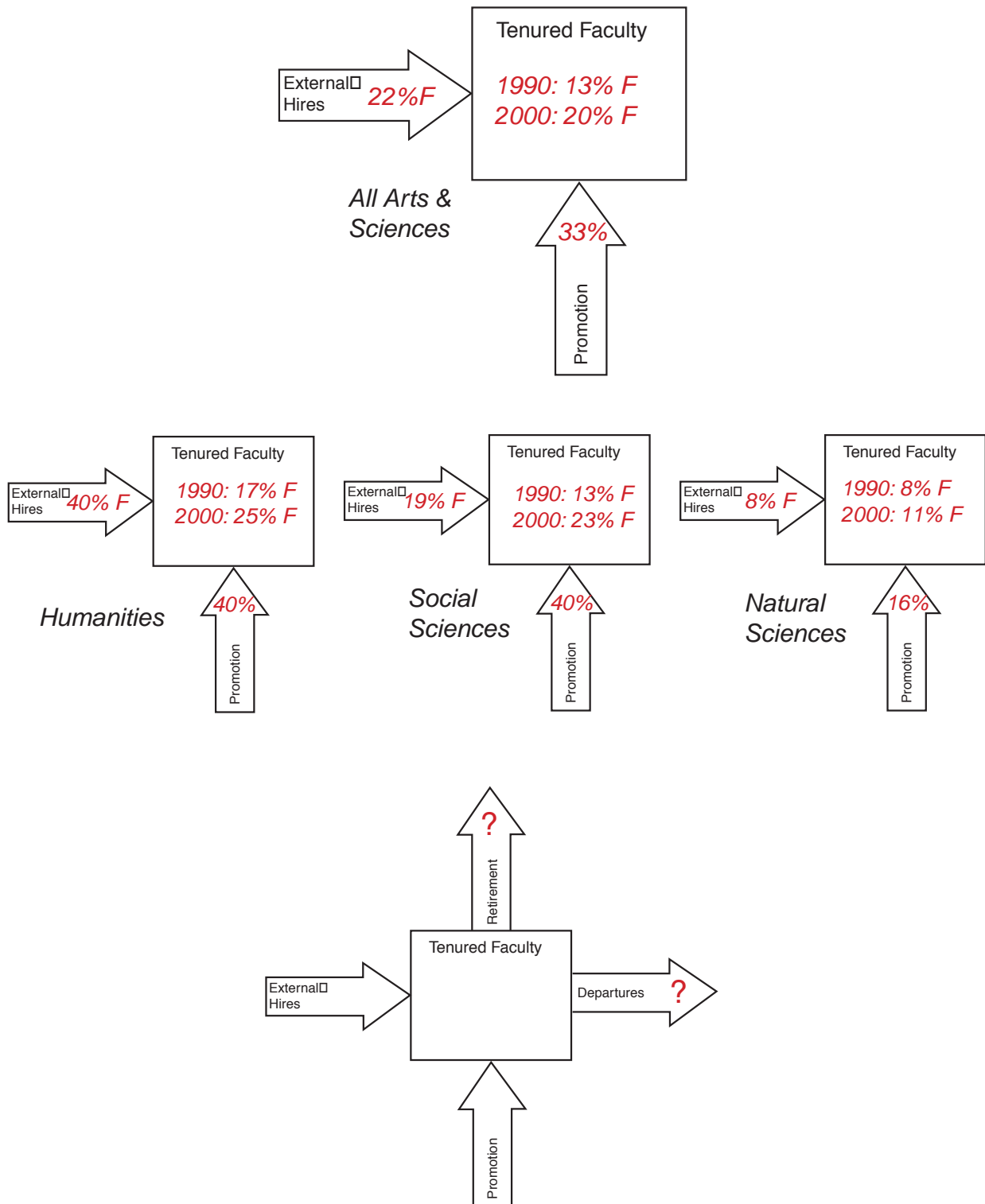
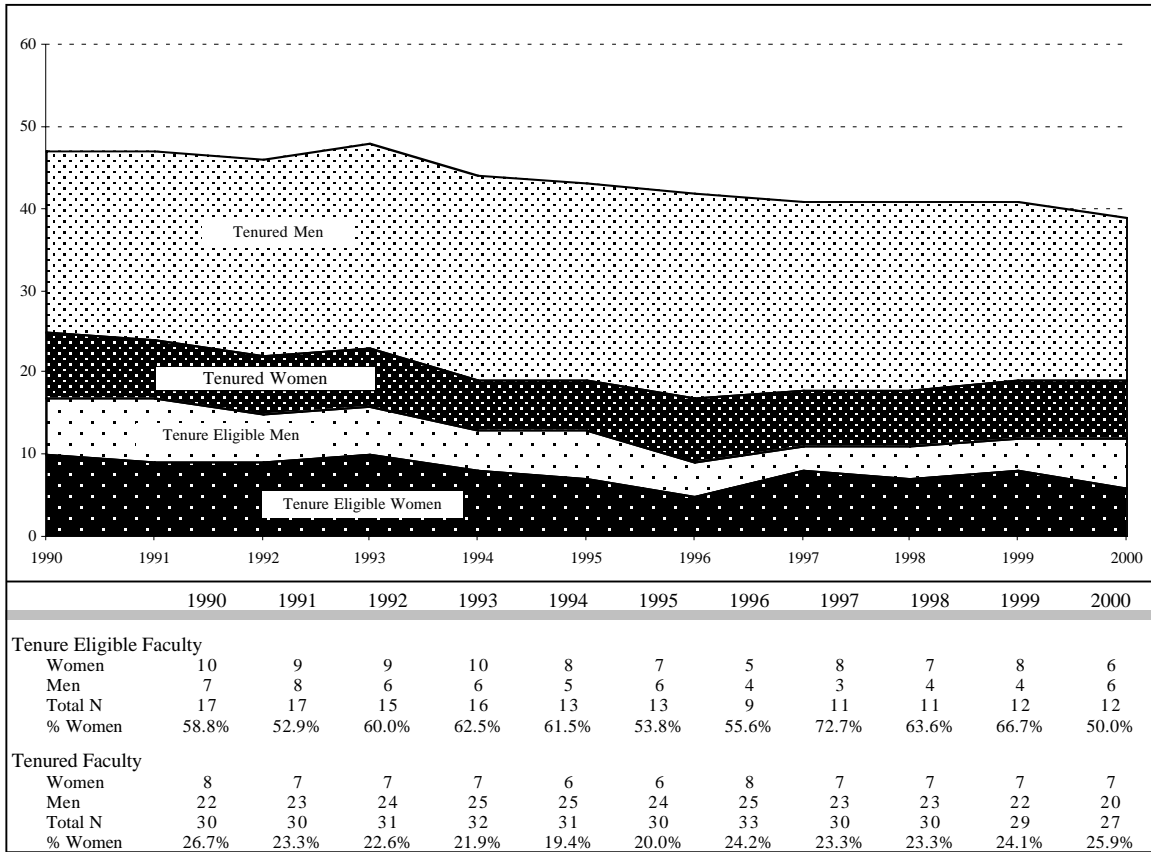


Exhibit 20

Example of a Department that has made negative progress
**DISTRIBUTION OF REGULAR FULL-TIME INSTRUCTIONAL FACULTY
 BY GENDER AND TENURE STATUS**
 1990-2000

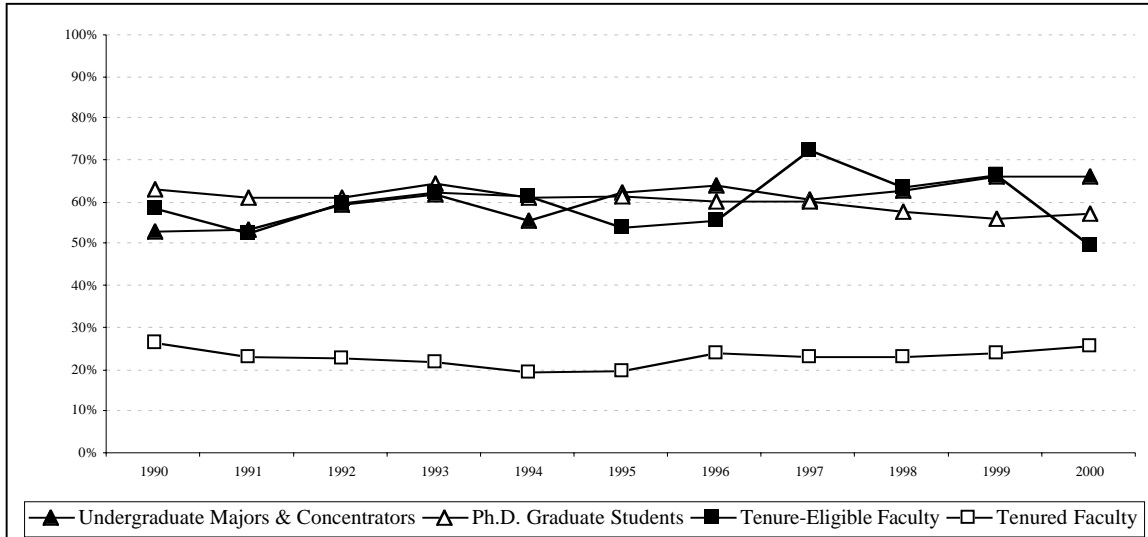


Notes: Tenure Eligible Faculty include Instructors, Assistant Professors, and Associate Professors without Tenure.
 Tenured Faculty include Associate Professors with Tenure and Full Professors. Adjunct or Visiting Faculty and Professors without Tenure are not included.

Source: Office of the Vice Provost for Academic Administration.

Exhibit 21

Same Department as previous exhibit
**COMPARISON OF THE PERCENTAGE OF WOMEN STUDENT MAJORS
 AND FULL-TIME INSTRUCTIONAL WOMEN FACULTY**
 Undergraduate Majors & Concentrators and Ph.D. Graduate Students; Tenured and Tenure-Eligible Faculty



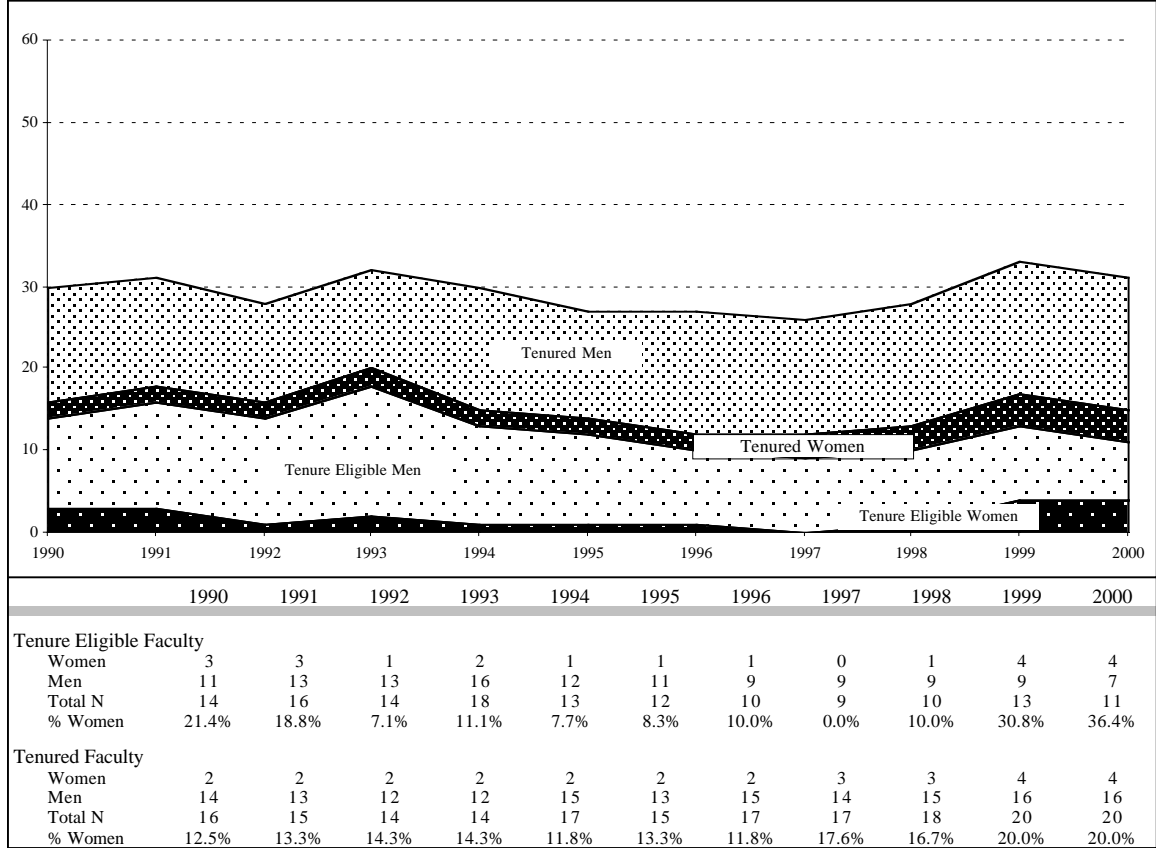
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Undergraduate Majors & Concentrators											
Women	177	170	153	160	168	184	194	168	182	197	196
Men	155	146	104	98	134	111	109	108	107	101	99
Total N	332	316	257	258	302	295	303	276	289	298	295
% Women	53.3%	53.8%	59.5%	62.0%	55.6%	62.4%	64.0%	60.9%	63.0%	66.1%	66.4%
Ph.D. Graduate Students											
Women	205	186	187	192	171	165	154	152	134	118	118
Men	119	119	119	105	109	103	102	100	97	93	87
Total N	324	305	306	297	280	268	256	252	231	211	205
% Women	63.3%	61.0%	61.1%	64.6%	61.1%	61.6%	60.2%	60.3%	58.0%	55.9%	57.6%
Tenure-Eligible Faculty											
Women	10	9	9	10	8	7	5	8	7	8	6
Men	7	8	6	6	5	6	4	3	4	4	6
Total N	17	17	15	16	13	13	9	11	11	12	12
% Women	58.8%	52.9%	60.0%	62.5%	61.5%	53.8%	55.6%	72.7%	63.6%	66.7%	50.0%
Tenured Faculty											
Women	8	7	7	7	6	6	8	7	7	7	7
Men	22	23	24	25	25	24	25	23	23	22	20
Total N	30	30	31	32	31	30	33	30	30	29	27
% Women	26.7%	23.3%	22.6%	21.9%	19.4%	20.0%	24.2%	23.3%	23.3%	24.1%	25.9%

Notes: Undergraduates included are those students who have declared a major or concentration, usually juniors and seniors. Graduate Students includes students in registered in non-terminal M.A./M.S. and in Ph.D. programs. Tenure Eligible Faculty include Instructors, Assistant Professors, and Associate Professors without Tenure. Tenured Faculty include Associate Professors with Tenure and Full Professors. Adjunct or Visiting Faculty and Professors without Tenure are not included.

Sources: Student data are from the Decision Support System (DSS). Faculty data are from the Office of the Vice Provost for Academic Administration.

Exhibit 22

Example of a department that has increased representation of women
**DISTRIBUTION OF REGULAR FULL-TIME INSTRUCTIONAL FACULTY
 BY GENDER AND TENURE STATUS**
 1990-2000

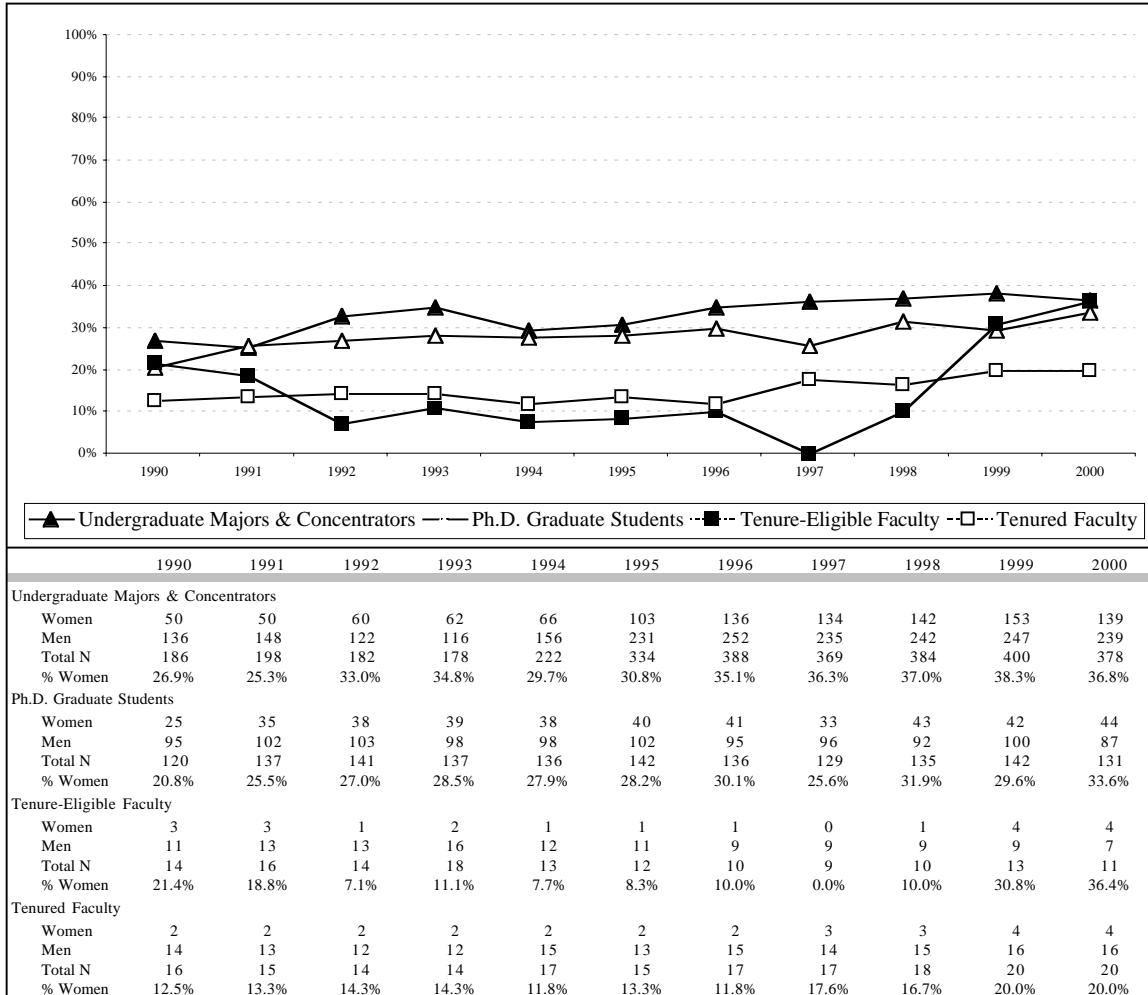


Notes: Tenure Eligible Faculty include Instructors, Assistant Professors, and Associate Professors without Tenure. Tenured Faculty include Associate Professors with Tenure and Full Professors. Adjunct or Visiting Faculty and Professors without Tenure are not included.

Source: Office of the Vice Provost for Academic Administration.

Exhibit 23

Same Department as previous exhibit
**COMPARISON OF THE PERCENTAGE OF WOMEN STUDENT MAJORS
 AND FULL-TIME INSTRUCTIONAL WOMEN FACULTY**
 Undergraduate Majors & Concentrators and Ph.D. Graduate Students; Tenured and Tenure-Eligible Faculty



Notes: Undergraduates included are those students who have declared a major or concentration, usually juniors and seniors. Graduate Students includes students in registered in non-terminal M.A./M.S. and in Ph.D. programs. Tenure Eligible Faculty include Instructors, Assistant Professors, and Associate Professors without Tenure. Tenured Faculty include Associate Professors with Tenure and Full Professors. Adjunct or Visiting Faculty and Professors without Tenure are not included.

Sources: Student data are from the Decision Support System (DSS). Faculty data are from the Office of the Vice Provost for Academic Administration.

Exhibit 24

Change in Representation of Women on Faculty
(1990 – 2000)

Improved substantially:

Anthropology
Classics
Economics
Italian
Philosophy
Psychology
Sociology

Least Improved:

English & Comparative Literature
Germanic Languages
Middle East & Asian Languages & Culture