Do the Best Researchers and Society Win?

Fairness, Validity, and Bias in Promotion and Tenure Decision Making

AIM Network Meeting: November 8, 2022

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Fairness and Bias in Promotion and Tenure (P&T) Processes

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November 8, 2022

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Project Goals
Background and Methods
Results
Takeaways and Recommendations

This Project is Funded Through NSF and the SLOAN Foundation

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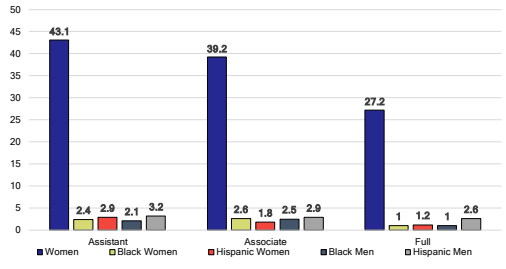
NSF Award Number: 2100034

Agenda

Overall Project Goals
Background and Methods
Dataset Descriptives
Analysis and Results
Takeaways and Recommendations

Women and Minorities are Underrepresented in Academia



We have 6 main Research Questions

1. What is the relationship between applicants' scholarly productivity and demographics with ERL linguistic content and length?
2. Do ERL writer characteristics predict ERL linguistic content and length?
3. What role does linguistic letter content and length play in determining subsequent promotion and tenure votes?
4. What role do tenure clock extensions, particularly caregiver and COVID clock extensions, play in ERL language and committee votes?
5. Do ERLs describe a candidate's collaborative research differently based on candidate gender?
6. Which ERL and P&T policies increase the validity of ERLs to where they are more strongly related to objective scholarly outcomes than to ERL writer features?

Looking at Specific Promotion and Tenure Questions

How does race and gender affect voting outcomes?

Do tenure clock extensions affect some candidates more than others?

We are a consortium of 10 partner institutions

LEHIGH · LSU · RICE · UTRGV

- 2017 - 2020 (Archival)
- 2021 - 2022 (COVID extension analysis)
- Total of 1700 candidates
- Over 9000 ERLs

These variables were captured from P&T packets & CVs:

Applicant & Letter Writer Features	Applicant & Letter Writer Productivity	Institution Features
Gender	H Index & Total Citations	Yes/No vote at Department, College, & University level
Ethnicity	Google Scholar Link	P&T Policies
Academic Discipline	# of students supervised (Candidate only)	
Institution Rank	External Grants (Candidate only)	
Year Ph.D. granted		
Tenure extension (Candidate only)		

We scrape Google Scholar profiles to collect data on research productivity

Data Scraping

Google Scholar

- ~200 complete records are collected by one device in one week

Other Databases Scraped for Additional Information

Scopus®

ACADEMIC ANALYTICS

We use Linguistic Inquiry Word Count (LIWC) to analyze letter content

1 Applicant Qualities	2 Applicant Productivity	3 Diversity, Equity, & Inclusion	4 Promotion and Tenure
Service and Invisible Service	Research	Diversity, Equity, and Inclusion	Early Promotion
Mentorship	Research Productivity	Age	Comparison
Exceeding Expectations	Innovation and Entrepreneurship	Sexism	Endorse P&T
Meeting Expectations	Patent(s)	Exclusion	
Independence	Funding	Spouse	
Leadership	Awards and Fellowships	Epistemic Exclusion	
Emotional Labor			
Doubt			
Brilliance			
Community Engagement			

Candidate & Letter Writer Demographics

- 93% of candidates are seeking promotion to Associate or Full Professor with Tenure
- 54% of candidates are in non-STEM disciplines
- 65% of candidates and 71% of letter writers are men
- 62% of candidates and 80% of letter writers are White

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5.0% of Candidates Requested a Non-COVID Tenure Extension for family or health reasons

- Approximately the same number of women and men took a non-COVID tenure extension
  - 31 Men & 28 Women

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P&T Outcomes

Unanimous Votes

- The number of committee "No Votes" equals 0 (including abstentions)

Overall Positive Vote

- The number of "Yes Votes" exceeds the number of "No Votes"

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P&T Outcomes: Control Variables

Candidate H-Index at Time of P&T

- Calculated with scraped Google Scholar data

Candidate Discipline

- CIP Code

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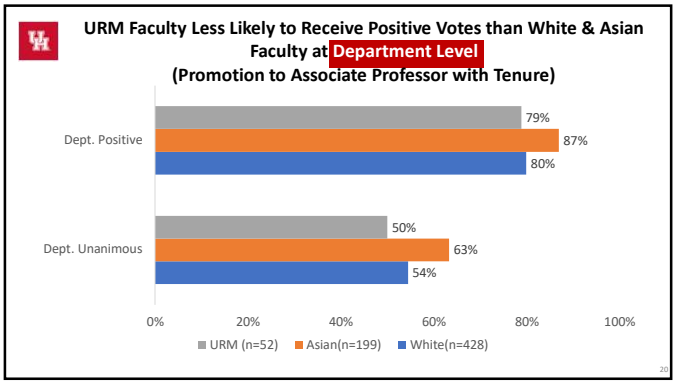
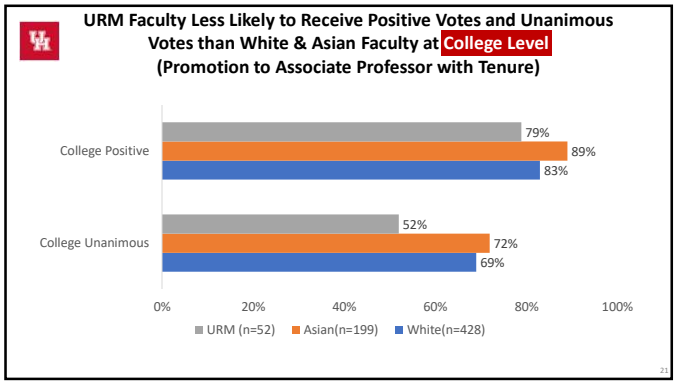
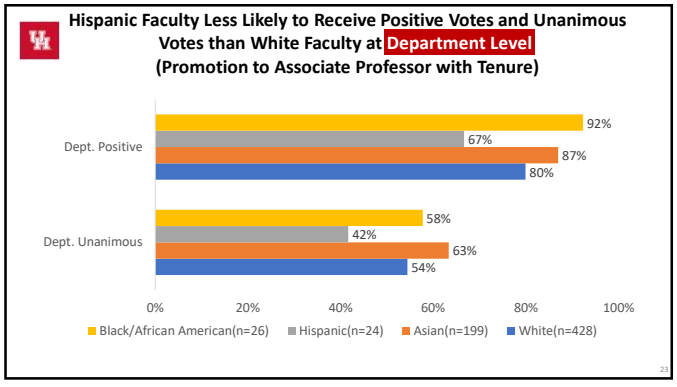
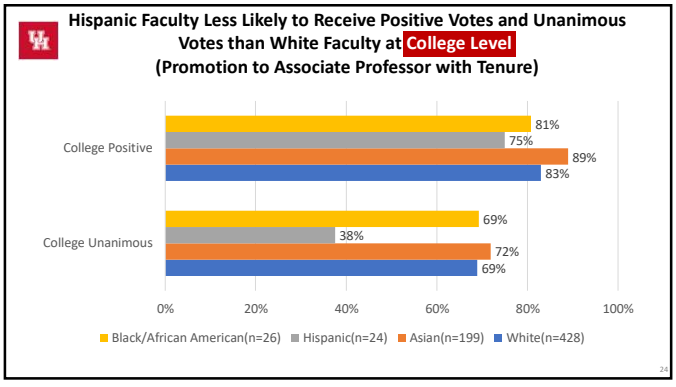
Promotion to Associate Professor



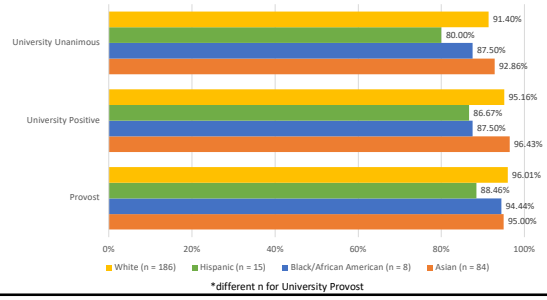


Observed Trends Most Pronounced for Hispanic Faculty





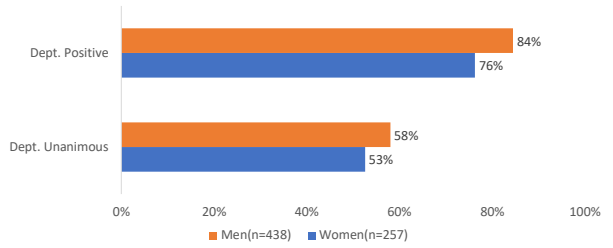
Hispanic Faculty Least Likely to Receive Unanimous & Overall Positive Votes than White & Asian Faculty at University Level (Promotion to Associate Professor with Tenure)



*different n for University Provost

Slightly less favorable voting outcomes by gender for promotion to Associate Professor with Tenure

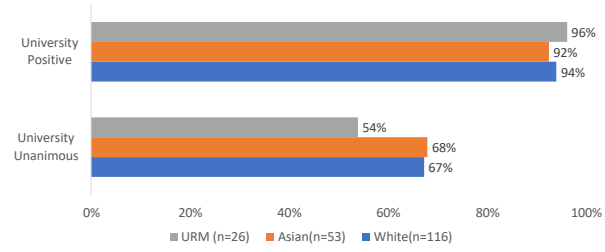
Women Less Likely to Receive Positive and Unanimous Votes than Men at Department Level (Promotion to Associate Professor with Tenure)



Promotion to Full Professor

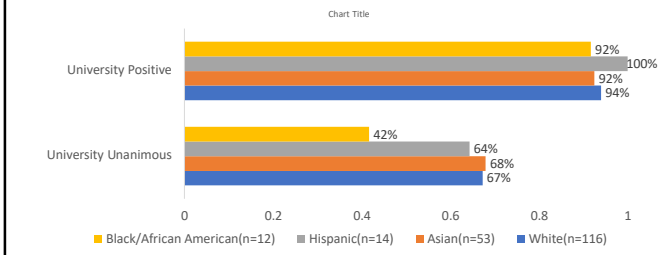
Fewer favorable votes for URM Faculty at University Level (Promotion to Full)

URM Faculty Less Likely to Receive Unanimous Votes than White & Asian Faculty at University Level (Promotion to Full Professor with Tenure)



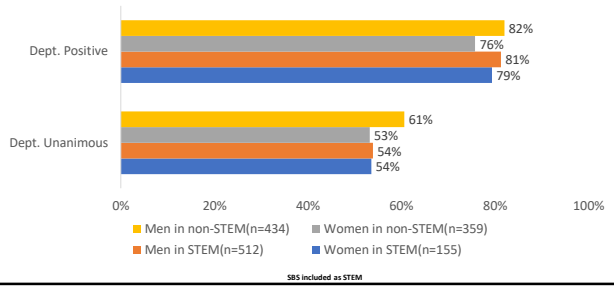
Black faculty receive least favorable voting outcome at University level (Promotion to Full Professor)

Black Faculty Less Likely to Receive Unanimous Votes than White Faculty at University Level (Promotion to Full Professor with Tenure)



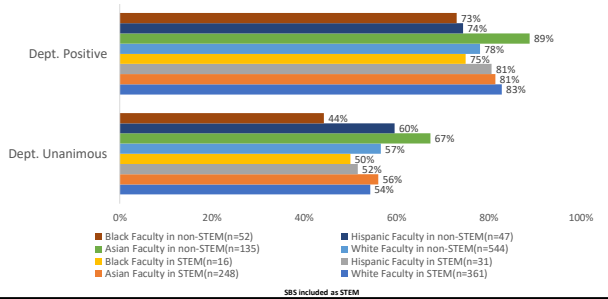
Less favorable outcomes for women in non-STEM than in STEM disciplines at Department level

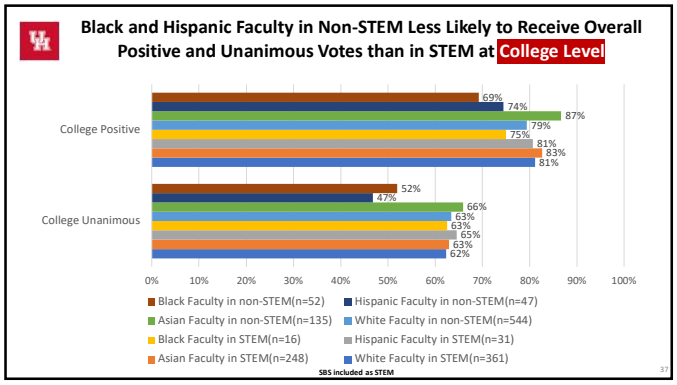
Women in non-STEM Less Likely to Receive Positive and Unanimous Votes than Men in Non-STEM at Department Level

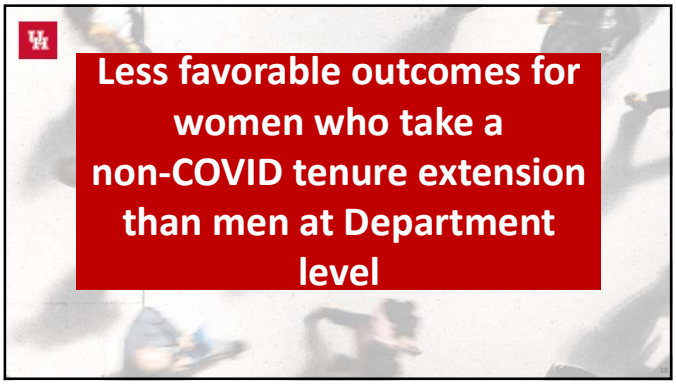


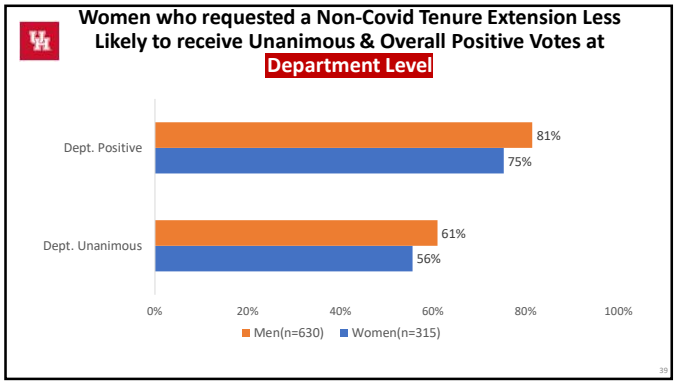
Less favorable outcomes for Hispanic and Black Faculty in non-STEM than in STEM disciplines at Departmental and College levels

Hispanic Faculty in Non-STEM Less Likely to Receive Overall Positive than in STEM at Department Level

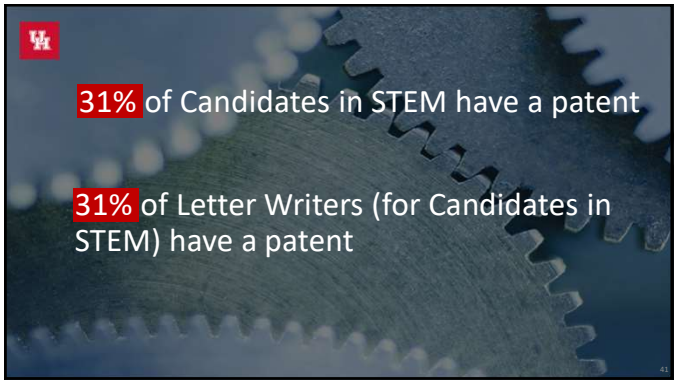


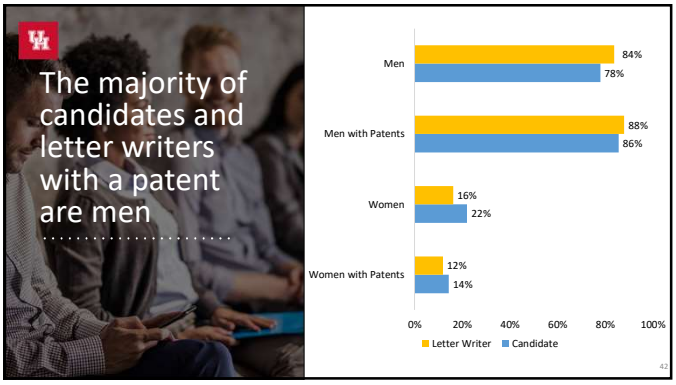

Black and Hispanic Faculty in Non-STEM Less Likely to Receive Overall Positive and Unanimous Votes than in STEM at College Level
College Positive
College Unanimous
69%
74%
87%
79%
75%
81%
83%
81%
52%
47%
66%
63%
63%
65%
63%
62%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Black Faculty in non-STEM(n=52)
Hispanic Faculty in non-STEM(n=47)
Asian Faculty in non-STEM(n=135)
White Faculty in non-STEM(n=544)
Black Faculty in STEM(n=16)
Hispanic Faculty in STEM(n=31)
Asian Faculty in STEM(n=248)
White Faculty in STEM(n=361)
SBS included as STEM


Less favorable outcomes for women who take a non-COVID tenure extension than men at Department level

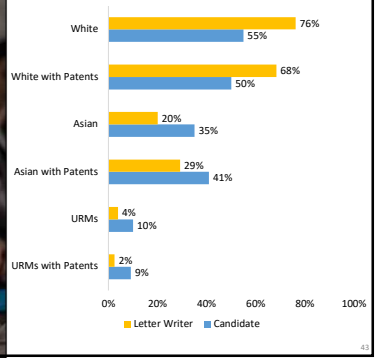

Women who requested a Non-Covid Tenure Extension Less Likely to receive Unanimous & Overall Positive Votes at Department Level
Dept. Positive
Dept. Unanimous
81%
75%
61%
56%
0%
20%
40%
60%
80%
100%
Men(n=630)
Women(n=315)

What Role Does Innovation and Entrepreneurship Play in Promotion and Tenure?


31% of Candidates in STEM have a patent
31% of Letter Writers (for Candidates in STEM) have a patent


The majority of candidates and letter writers with a patent are men
Men
Men with Patents
Women
Women with Patents
84%
78%
88%
86%
16%
22%
12%
14%
0%
20%
40%
60%
80%
100%
Letter Writer
Candidate

The majority of candidates and letter writers with a patent are White or Asian



Less Favorable Outcomes for I&E Endeavors

- Candidates with patents receive more negative votes at the university level
- Consequences for candidates who receive patent language in their ERLs
  - More negative votes at the departmental and university levels
  - Fewer unanimous votes at the departmental and university levels
- Candidates who receive innovation language in their ERLs receive fewer unanimous votes at the departmental level

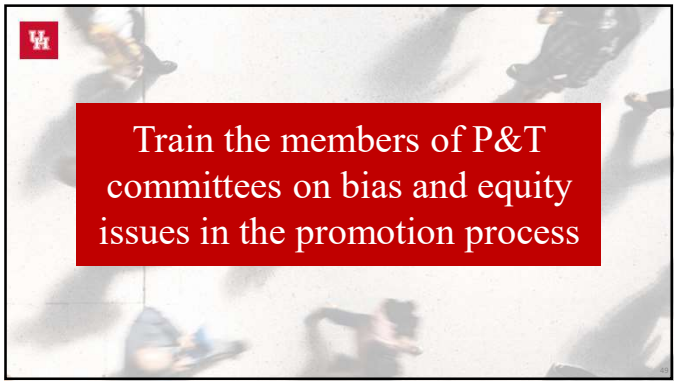
I&E Takeaways

- A focus on patents and I&E language is not pertinent to fostering an inclusive academy
- I&E accomplishments are associated with less favorable P&T outcomes
- P&T committee training should be implemented to advance diversity goals and I&E goals

Recommendations for the P&T Process

Reconsider the practice of treating unanimous votes as the "gold standard" for a successful application to full professor

Ensure representation from multiple and diverse perspectives on P&T committees


Train the members of P&T committees on bias and equity issues in the promotion process

Give more weight to service and mentorship in promotion decisions

Build a clear, structured promotion process for all candidates