Potential Risk of Gender Bias in Medical Faculty Narrative Evaluations

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Two narratives about medical faculty

Dr. M is an admired physician and remarkable educator. He/she provides good feedback to students, who report that he/she is a pleasant, competent instructor. Clinically, Dr. M is organized and careful to develop plans, but efficient also, with his/her case work. Students report that he/she has a warm personality with the patients.

Dr. R is committed to teaching. Students feel that it is a privilege to work with him/her. He/she is incredibly helpful as an instructor. Dr. R has a wealth of knowledge about clinical medicine but is also able to see the big picture. He/she is able to treat complex medical problems. Students feel that Dr. R is exciting to work with and has a good sense of humor with patients.

Overview
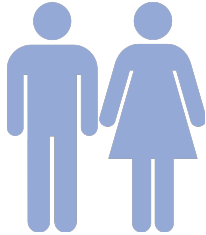
1. Background of gendered language
2. Research questions
3. Study design
4. Developing the narratives
5. Measures – Rating, Ranking, and Demographics
6. Next steps
7. Why does this matter? Significance and Limitations
8. Lessons learned
9. Questions or feedback

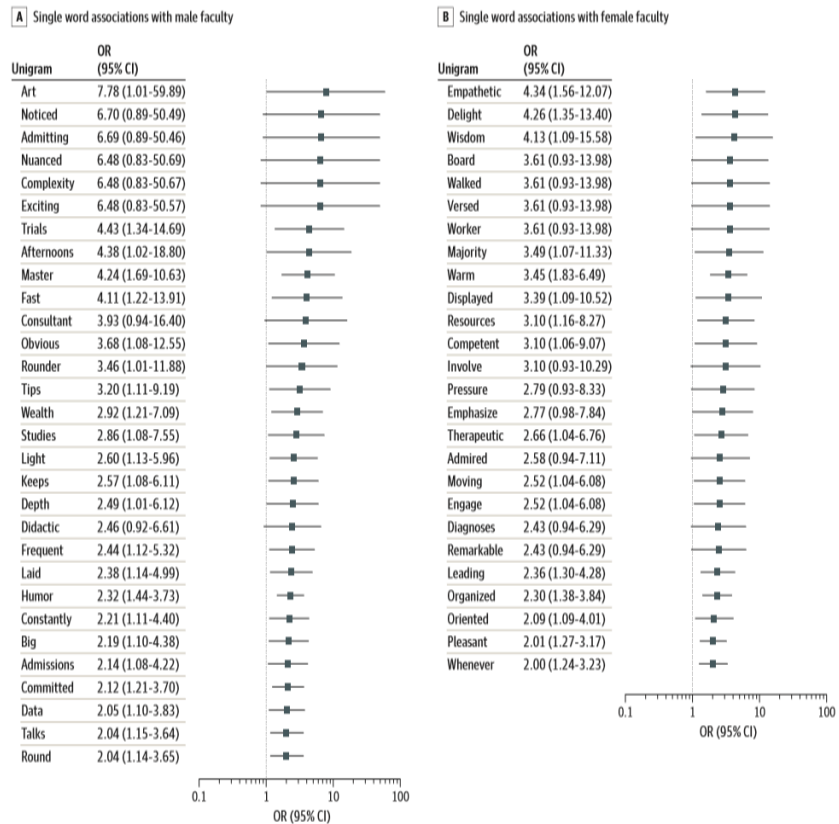# 1. Background of gendered language

- Gender bias persists in the world of academia, including in the medical profession
  - Medical trainees use different types of language when evaluating male faculty vs. female faculty
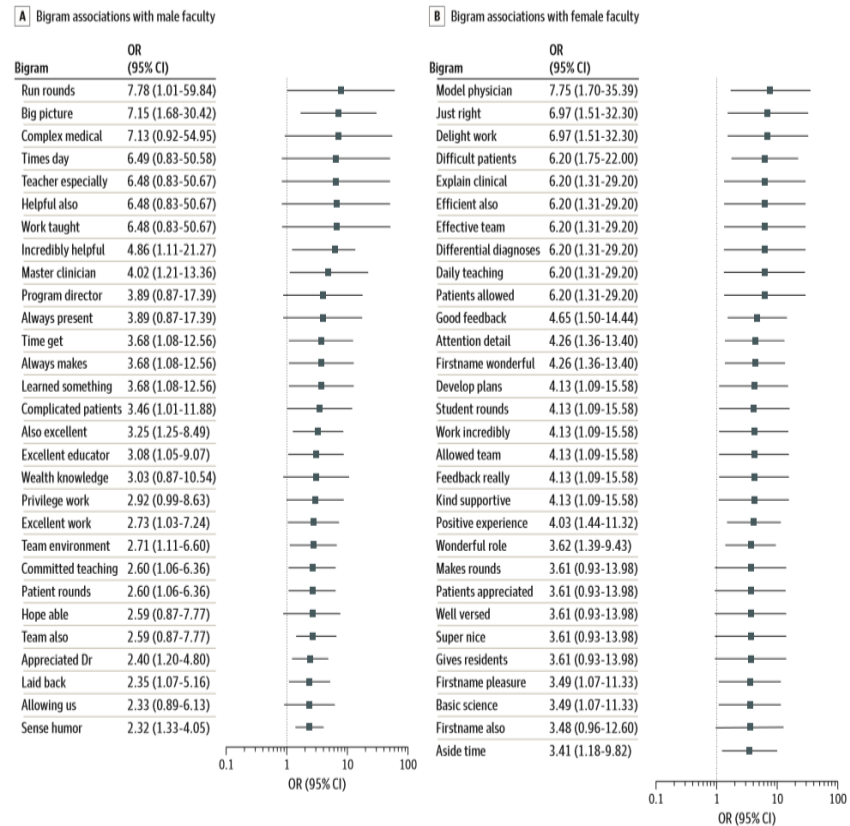
  Heath et al. (2019)

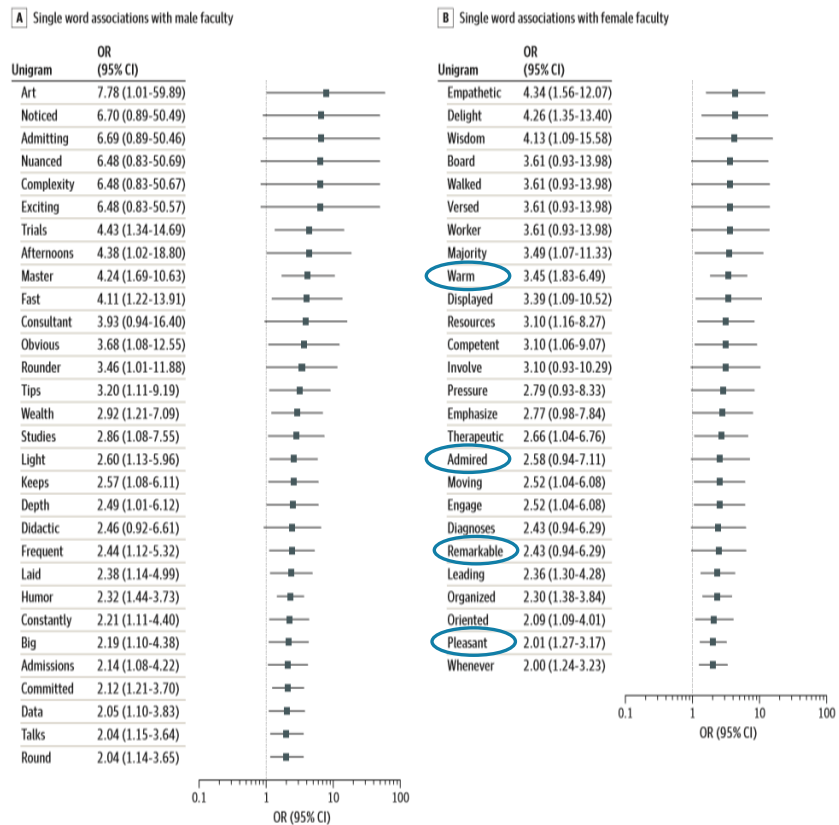# Figure 1. Significant Single-Word (Unigram) Associations by Faculty Gender

A Single word associations with male faculty

Unigram	OR (95% CI)	
Art	7.78 (1.01-59.89)	
Noticed	6.70 (0.89-50.49)	
Admitting	6.69 (0.89-50.46)	
Nuanced	6.48 (0.83-50.69)	
Complexity	6.48 (0.83-50.67)	
Exciting	6.48 (0.83-50.57)	
Trials	4.43 (1.34-14.69)	
Afternoons	4.38 (1.02-18.80)	
Master	4.24 (1.69-10.63)	
Fast	4.11 (1.22-13.91)	
Consultant	3.93 (0.94-16.40)	
Obvious	3.68 (1.08-12.55)	
Rounder	3.46 (1.01-11.88)	
Tips	3.20 (1.11-9.19)	
Wealth	2.92 (1.21-7.09)	
Studies	2.86 (1.08-7.55)	
Light	2.60 (1.13-5.96)	
Keeps	2.57 (1.08-6.11)	
Depth	2.49 (1.01-6.12)	
Didactic	2.46 (0.92-6.61)	
Frequent	2.44 (1.12-5.32)	
Laid	2.38 (1.14-4.99)	
Humor	2.32 (1.44-3.73)	
Constantly	2.21 (1.11-4.40)	
Big	2.19 (1.10-4.38)	
Admissions	2.14 (1.08-4.22)	
Committed	2.12 (1.21-3.70)	
Data	2.05 (1.10-3.83)	
Talks	2.04 (1.15-3.64)	
Round	2.04 (1.14-3.65)	

B Single word associations with female faculty

Unigram	OR (95% CI)	
Empathetic	4.34 (1.56-12.07)	
Delight	4.26 (1.35-13.40)	
Wisdom	4.13 (1.09-15.58)	
Board	3.61 (0.93-13.98)	
Walked	3.61 (0.93-13.98)	
Versed	3.61 (0.93-13.98)	
Worker	3.61 (0.93-13.98)	
Majority	3.49 (1.07-11.33)	
Warm	3.45 (1.83-6.49)	
Displayed	3.39 (1.09-10.52)	
Resources	3.10 (1.16-8.27)	
Competent	3.10 (1.06-9.07)	
Involve	3.10 (0.93-10.29)	
Pressure	2.79 (0.93-8.33)	
Emphasize	2.77 (0.98-7.84)	
Therapeutic	2.66 (1.04-6.76)	
Admired	2.58 (0.94-7.11)	
Moving	2.52 (1.04-6.08)	
Engage	2.52 (1.04-6.08)	
Diagnoses	2.43 (0.94-6.29)	
Remarkable	2.43 (0.94-6.29)	
Leading	2.36 (1.30-4.28)	
Organized	2.30 (1.38-3.84)	
Oriented	2.09 (1.09-4.01)	
Pleasant	2.01 (1.27-3.17)	
Whenever	2.00 (1.24-3.23)	

OR (95% CI)

Figure 2. Significant 2-Word (Bigram) Associations by Faculty Gender

A Bigram associations with male faculty

Bigram	OR (95% CI)	
Run rounds	7.78 (1.01-59.84)	
Big picture	7.15 (1.68-30.42)	
Complex medical	7.13 (0.92-54.95)	
Times day	6.49 (0.83-50.58)	
Teacher especially	6.48 (0.83-50.67)	
Helpful also	6.48 (0.83-50.67)	
Work taught	6.48 (0.83-50.67)	
Incredibly helpful	4.86 (1.11-21.27)	
Master clinician	4.02 (1.21-13.36)	
Program director	3.89 (0.87-17.39)	
Always present	3.89 (0.87-17.39)	
Time get	3.68 (1.08-12.56)	
Always makes	3.68 (1.08-12.56)	
Learned something	3.68 (1.08-12.56)	
Complicated patients	3.46 (1.01-11.88)	
Also excellent	3.25 (1.25-8.49)	
Excellent educator	3.08 (1.05-9.07)	
Wealth knowledge	3.03 (0.87-10.54)	
Privilege work	2.92 (0.99-8.63)	
Excellent work	2.73 (1.03-7.24)	
Team environment	2.71 (1.11-6.60)	
Committed teaching	2.60 (1.06-6.36)	
Patient rounds	2.60 (1.06-6.36)	
Hope able	2.59 (0.87-7.77)	
Team also	2.59 (0.87-7.77)	
Appreciated Dr	2.40 (1.20-4.80)	
Laid back	2.35 (1.07-5.16)	
Allowing us	2.33 (0.89-6.13)	
Sense humor	2.32 (1.33-4.05)	

B Bigram associations with female faculty

Bigram	OR (95% CI)	
Model physician	7.75 (1.70-35.39)	
Just right	6.97 (1.51-32.30)	
Delight work	6.97 (1.51-32.30)	
Difficult patients	6.20 (1.75-22.00)	
Explain clinical	6.20 (1.31-29.20)	
Efficient also	6.20 (1.31-29.20)	
Effective team	6.20 (1.31-29.20)	
Differential diagnoses	6.20 (1.31-29.20)	
Daily teaching	6.20 (1.31-29.20)	
Patients allowed	6.20 (1.31-29.20)	
Good feedback	4.65 (1.50-14.44)	
Attention detail	4.26 (1.36-13.40)	
Firstname wonderful	4.26 (1.36-13.40)	
Develop plans	4.13 (1.09-15.58)	
Student rounds	4.13 (1.09-15.58)	
Work incredibly	4.13 (1.09-15.58)	
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Basic science	3.49 (1.07-11.33)	
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Heath et al. (2019)

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Heath et al. (2019)

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1. Background of gendered language

- Gender bias persists in the world of academia, including in the medical profession
  - Medical trainees use different types of language when evaluating male faculty vs. female faculty

  Heath et al. (2019)

Why study this further?
- Applicability to the "glass ceiling"
- Other industries: women have lower "promotion potential" in the eyes of superiors

  Landau, J. (1995)
- Using *identical* resumes or qualifications does not reveal bias

  Wiggins, T., & Coggins, C. (1986); Johnson, D., Larsen, M., & Wadlow, J. (1982)

2. Research questions

- When medical trainees chose different terms and phrases to describe medical faculty, do they contribute to the gender disparity in promotion?
- Does the difference in language used by medical trainees to describe male faculty versus female faculty have an influence on the appraisal of a faculty member's potential to succeed in a leadership position?

Goal: Determine the impact of this "gendered language" in medical faculty narrative evaluations on individuals' perceptions of the faculty.

3. Study design

- Develop a survey for medical faculty (*Qualtrics*)
- Ask participants to read hypothetical narratives
- Ask participants to rate the hypothetical faculty members on measures associated with promotion
- Ask participants to compare the two hypothetical faculty members and select the "better" of the two
- Record demographic information

4. Developing the narratives

Example Comments:

Working with FIRSTNAME was one of the best MICU experiences of the year. PRONOUN really supports the fellow taking charge of rounds and giving a chance to develop style and autonomy. PRONOUN is also an outstanding teacher, and his formal and informal teaching on physiology and nuanced vent management were a special addition to the MICU experience. A pleasure to work with, extremely professional, and an overall great experience for learning and growing as a fellow.

FIRSTNAME is an absolutely brilliant physician. I learned a ton from PRONOUN and PRONOUN really made the grueling work experience fun and enjoyable. PRONOUN is a great team leader and is incredibly gifted at teaching to many levels. I appreciate PRONOUN's use of the socratic method for teaching on rounds. PRONOUN's sense of humor keeps things light despite the challenging situations that arise in the MICU. I had a fantastic experience working with FIRSTNAME and hope we have the opportunity again soon!

Dr. LASTNAME has excellent clinical skills and is a phenomenal teacher. I learned a tremendous amount from PRONOUN during our rotation.

very knowledgeable, provides excellent perspective on inpatient versus outpatient work up, allows for fellow independence on consults which is appreciated

Appreciate the teaching during this rotation.

Excellent teaching, clinical decision making, especially for interstitial lung diseases and those with complex and uncertain presentations. Supportive of fellow duty hours, autonomy, and taking a leading role on the team. Great to work with.

Great clinical teacher.

Excellent clinical teacher. Fantastic critical care experience.

always a pleasure. Appreciate the flexibility to determine the plan on my own and lead rounds when possible.

A great 2 weeks. Appropriate balance of autonomy and support. Great rapport with the team. Communicates expectations clearly. Looking forward to working with him again.

Fantastic attending. Please see other comments

incredibly dedicated, knowledgeable, superb clinician.

Had fun discussing cases with PRONOUN.

Great teacher overall.

- Two versions that use the male-associated words and phrases
- Two versions that use the female-associated words and phrases
- All similar in structure, content, length, number of gender-associated words/phrases used
- Dr. S, Dr. R, Dr. P, Dr. M

Example narratives

Dr. S is an excellent educator and master clinician. When working with students he/she is able to cover subjects with depth, and students feel that they have learned something after working with him/her. Clinically, Dr. S is an expert at treating complicated patients. He/she is able to work fast, yet students' perceive his/her presence as laid back with patients.

Example narratives

Dr. S is an excellent educator and master clinician. When working with students he/she is able to cover subjects with depth, and students feel that they have learned something after working with him/her. Clinically, Dr. S is an expert at treating complicated patients. He/she is able to work fast, yet students' perceive his/her presence as laid back with patients.

Example narratives

Dr. S is an excellent educator and master clinician. When working with students he/she is able to cover subjects with depth, and students feel that they have learned something after working with him/her. Clinically, Dr. S is an expert at treating complicated patients. He/she is able to work fast, yet students' perceive his/her presence as laid back with patients.

Dr. P is a model physician and a delight to work with. Students report having a positive experience with him/her and feel that he/she is very kind and supportive as an instructor. Clinically, Dr. P is well versed in diagnosis and pays close attention to detail. Students describe Dr. P as empathetic and note that patients appreciate his/her work.

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Dr. P is a model physician and a delight to work with. Students report having a positive experience with him/her and feel that he/she is very kind and supportive as an instructor. Clinically, Dr. P is well versed in diagnosis and pays close attention to detail. Students describe Dr. P as empathetic and note that patients appreciate his/her work.

5. Measures – Rating

- Rate the faculty member on (from "extremely negative" to "extremely positive"):
  - Overall ability
  - Clinical ability
  - Teaching ability
  - Leadership potential
- Rate your perception of how certain individuals might feel about the faculty member ("extremely dissatisfied" to "extremely satisfied"):
  - Patient
  - Medical student
  - Medical intern or resident
  - Supervisor
- Rate how willing you would be to have the faculty member as a colleague ("extremely unwilling" to "extremely willing").
- Rate your perception of the experience level of this faculty member ("extremely inexperienced" to "extremely experienced").

5. Measures – Rating (*Qualtrics*)

Please use the narrative to rate the faculty member on each of the following.

	Extremely negative	Moderately negative	Slightly negative	Neither positive nor negative	Slightly positive	Moderately positive	Extremely positive
Overall ability	○	○	○	○	○	○	○
Clinical ability	○	○	○	○	○	○	○
Teaching ability	○	○	○	○	○	○	○
Leadership potential	○	○	○	○	○	○	○

5. Measures – Ranking

- Mark which faculty member you perceive as superior for:
  - Overall ability
  - Clinical ability
  - Teaching ability
  - Leadership potential
- Mark which faculty member you perceive as providing the highest satisfaction to the following individuals:
  - Patient
  - Medical student
  - Medical intern or resident
  - Supervisor
- Mark which faculty member you would be most willing to have as a colleague.
- Mark which faculty member you perceive as having the highest level of experience.

5. Measures – Ranking (*Qualtrics*)

Please use the narratives to mark which faculty member you perceive as superior for each category.

	Faculty member 1	Faculty member 2
Overall ability	○	○
Cinical ability	○	○
Teaching ability	○	○
Leadership potential	○	○

Please mark which faculty member you would be most willing to have as a collegue.

Faculty member 1	Faculty member 2
○	○

5. Measures – Demographic Questions

- In your job, how frequently do you:

    - Read faculty narrative evaluations?

    - Write faculty narrative evaluations?

- What is your age?

- What is your gender?

6. Next steps

- Sending out the survey to only one division of Penn Medicine

- Preliminary analysis

- Adapt survey as necessary and send to entire Medicine Dept.

7. Why does this matter?

SIGNIFICANCE

- Word choice differences are *especially* relevant if job qualifications are defined using stereotypically male characteristics
  Gorman, E. (2005)
- *Lower minimum standards* and *higher confirmatory standards* in the context of hiring and promotion
  Bosak, J. & Sczesny, S. (2011); Biernat, M. & Fuegen, K. (2001)

LIMITATIONS

- Our questions cannot capture everything related to promotion and our narratives are not without flaws
- Potential for interference from sex-role stereotyping
  Snipes, R., Oswald, S. & Caudill, S. (1998)

8. Lessons learned

- The importance of a conceptual framework

  - Having a focused research question

  - Every survey question must have a purpose

- IRB and other steps in the process

- Literature review and background as a basis

Questions or feedback?

THANK YOU!