

How Do Gender Stereotypes Affect Academic Career Development?

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What we believed...

- That the lack of women leaders in academic medicine would fix itself when the pipeline was full
- That if women just behaved like men in academic medicine, they would succeed at the same rate
- That academic medicine was a meritocracy where women's and men's accomplishments would be viewed and rewarded equally

What we now know...

- That unconscious gender-based assumptions and stereotypes are deeply embedded in the patterns of thinking of both men and women
- That women and work performed by women consistently receive lower evaluations than men and work performed by men (by both men and women evaluators)
- That these implicit cognitive processes function as “habits of mind” and are remediable

Gender Stereotypes

Common assumptions about how men and women behave

- Men are *agentic*: Decisive, competitive, ambitious, independent, willing to take risks
 - Women are *communal*: nurturing, gentle, supportive, sympathetic, dependent
 - Lead to *expectancy bias* and assumptions of *occupational role congruity*
 - *Social penalties* for violating prescriptive gender norms
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Works of multiple authors over 30 years: e.g. Eagly, Heilman, Bem, Broverman

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- Socialization of women toward “communal” specialties and lower status activities
 - Women physicians’ need to navigate the terrain between “giving orders” and gender norms for behavior
 - Gender bias in evaluation at critical career junctures
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Gender is a powerful status cue:

male > female

Status

**“Agentic” specialties:
Neurosurgery, Orthopedics,
Urology**

Lower status within specialties:

- education,
- service,
- anything specific to care of women,
- lower rank,
- non-tenured

Higher status within specialties:

- procedures (e.g. interv. cards, gyn oncology),
- higher rank,
- tenured

**“Communal” specialties:
Pediatrics, Family
Medicine, primary care IM
specialties
(GIM, Geriatrics)**

Proportion of women

Medical School Performance Evaluations: Does gender affect words and descriptors?

- Medical Student Performance Evaluation (MSPE);
AAMC attempt to standardize the “dean’s letter”
- 297 MSPEs of medical students applying to a
diagnostic radiology residency:
 - 227 male and 70 female students
 - 151 male, 140 female, 6 unknown authors (all Assoc. Dean or
comparable)
- Word categories, frequencies, and context analyzed

Isaac et al., Acad Med 86:1-8, 2011

Gender differences

- Male authors shorter MSPEs (209 words) ($p = .014$)
- Main effect student gender (MANOVA; Wilkes λ , $p = .046$)
- Significant differences in 3/85 word categories between the 4 author-student gender pairings (univariate F-tests)
- No difference NRMP ranked by author-student gender (26 M, 9 F)
 - Ranked students: “standout” ($p = .002$) and “positive emotion” ($p = .001$)

Isaac et al., Acad Med 86:1-8, 2011

Factor analysis – different patterns of words and descriptors in the 4 author-student gender pairs

Factor synthesis

- Male students:
 - Work eagerly, responsibly, and above expectations toward becoming an outstanding, insightful specialist
- Female students:
 - Work hard and enthusiastically; ask insightful questions befitting a specialist but would be exceptional in family medicine where they can take less initiative and responsibility

Male and female students socialized toward different specialties?

- Only female students with female authors had family medicine correlated with standout adjectives
- Male students
 - Male authors: Family medicine absent
 - Female authors: Family medicine negatively correlated with ability & insight
 - “[he] really surprised us! [he] is an exceptional student [in family medicine].”
 - “although [he] received highest honors on [his] family medicine rotation, surely [his] finest performance was on surgery ... was outstanding - spoke with families, got consent forms signed, was extremely aggressive....”

Conclusions

- Our results suggest that gender can override attempts at standardization of medical student performance evaluations
- These differences did not appear to affect the ranking of individual students
- The pattern of descriptors suggests that women may be subtly socialized toward family medicine and men toward subspecialties which requires further exploration

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Background

- Resident physicians placed in positions where they need to direct patient care
- Women are socialized to have less direct communication styles (*e.g. Juodvalkis et al., Int J Organizational Analysis 11:67-84, 2003*)
- Autocratic leadership style in women is least effective (*e.g. Eagly et al. Psychol Bull 111:3-22, 1992*)

Does gender affect resident experience with directing patient care?

Mixed methods

- Survey:
 - 65/100 UW Medicine Residents responded
 - Vignettes with varying degrees of assertive responses
 - Self-assessment of stress in giving orders
 - Rating of factors that affect effectiveness in directing patient care
- Semi-structured interview:
 - 16 residents

Survey results

- Male residents higher cumulative assertiveness score (p=0.047)
- Difference in self-reported stress by year of training (p=0.008) but not gender (p=0.86)
- 30% female and no male resident ranked gender as the greatest disadvantage in directing patient care (p<0.01)

Interviews

Congruent with gendered norms:

- Men more likely “authoritative” “confident” “assertive”
- Women more likely “reflective” “self-conscious”
- “Tone” noted to be important for women

Representative quotes:

- “I’ve seen men able to say things in just terrible tones, but it’s just accepted. Whereas if a woman tried that...” *Senior M*
- “It just didn’t seem right for me to tell people what to do, even if I was asking them in a nice way.” *Junior F*
- “Sometimes you’re afraid that you’ll be thought of as being bossy or too aggressive.” *Junior F*

Conclusion

Gender impacts the residency experience, especially for women in ways that are consistent with research on gender and social norms.

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Systematic Review of Interventions Affecting Gender Bias in Hiring

- 9639 from 9 electronic data bases
- 1920 abstracts screened
- 130 articles reviewed in full
- 27 met criteria:
 - After 1972
 - Randomized, controlled design
 - “Goldberg” paradigm (M and F with identical qualifications rated for employment outcomes)
 - Participants blinded to intent
 - Both genders in applicant pool and raters

What can institutions do to mitigate bias against women in hiring settings?

At least 1 RCT = level 1 evidence

- Infuse environment with statements that research evidence shows equivalent gender competence in relevant roles
- Encourage raters to take adequate time
- Allow applicants to provide individuating evidence of job-relevant competency
- Work for applicant pool to have at least 25% women
- Do not ask about parenthood status
- Use structured vs. unstructured interview questions
- Avoid man-suffix job titles (e.g. use chair rather than chairman)
- Use inclusion vs. exclusion strategy for selection from final list
- Implement training workshops for personnel decision-makers

Isaac, Lee, & Carnes. Acad Med, 84:1440-46, 2009

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The Impact of Gender Stereotype Priming

Exposure to stereotype-congruent information affects subsequent decision-making (multiple studies by Banaji's group, Steele's group including Davies et al. Pers Soc Psychol. 2005)

Semantic gender priming and tenure criteria?

- Top 25 ranked medical schools
- Tenure criteria from websites
- Scanned for “Leader”
- Slopes of regressions for annual % faculty who are tenured women x 7 years
- “Leader” = OR 6.0 (1.02, 35.37) for slope below median compared to those without

Marchant, et al., J Woman's Health, 2007

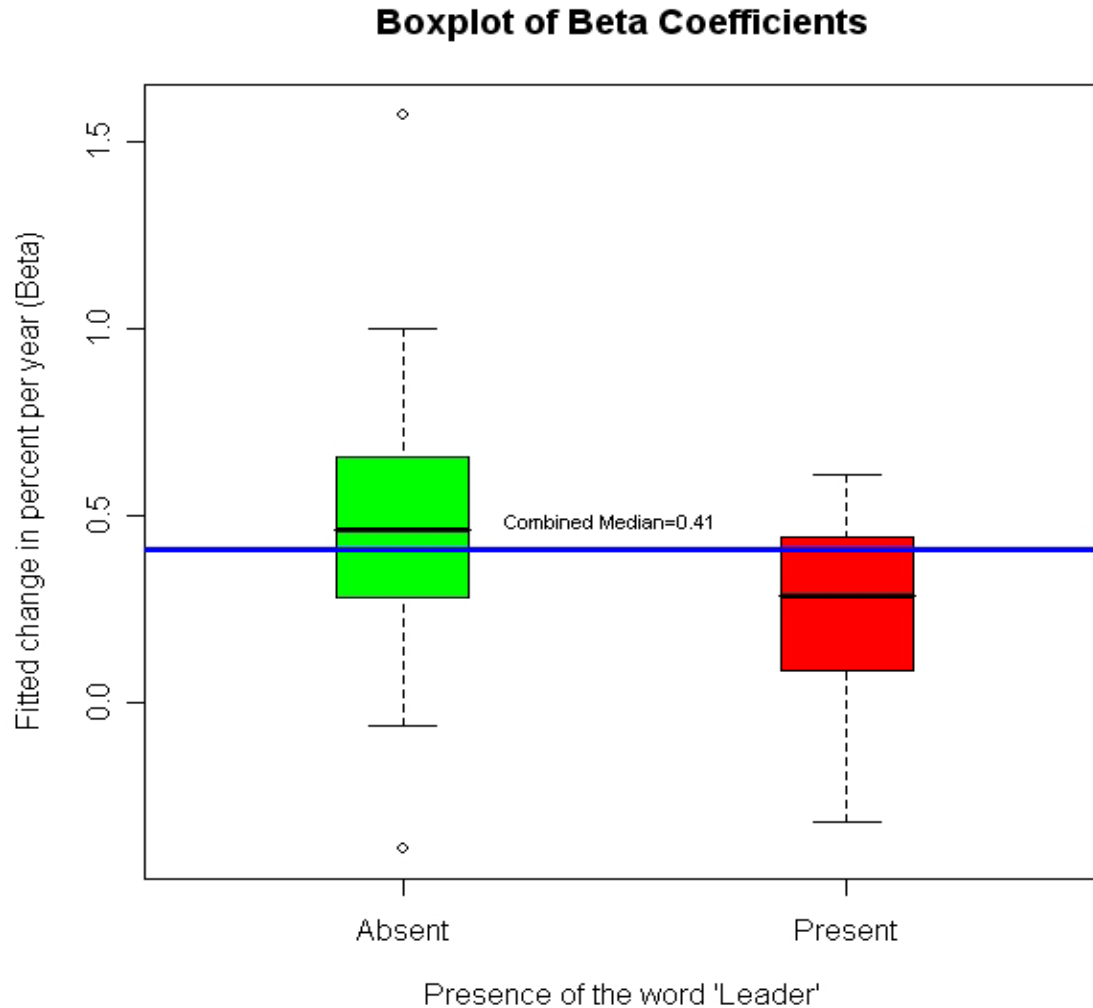


Figure 1. Box plots of beta coefficients (slopes of regression lines) for annual change in percent faculty who are tenured women over 7 years. Schools with the word “leader” in tenure criteria have significantly higher odds of having a slope below the median slope for all institutions ($p = 0.04$).

Words describing stereotypically male traits predominate in tenure criteria

Male

- Analytical
 - Competitive
 - Defends
 - Independent
 - Individualistic
 - Leadership
 - Risk
-

Med 5.5/school; 2-50

Total 183

Neutral

Friendly
Helpful
Inefficient
Truthful

4 schools
Total 5

Female

Sensitive
Understanding
Yielding

3 schools
Total 3

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Gender bias in grant review?

- Women are held to higher confirmatory standards to be judged competent in roles implicitly linked to men (*Biernat et al., Social Cognition 26:288, 2008*)
- Science is more strongly associated with male than female on implicit measures (*Nosek et al., Group Dynamics: Theory, Research, and Practice 6:101, 2002*)
- NIH R01s 2003-2007: For first time MDs and all experienced investigators, female applicants significantly less likely to be funded. *Ley & Hamilton Science 322:1472, 2008*
- NIH R01s 2008: For experienced investigators applying for renewals (Type 2), female applicants significantly less likely to be funded. *Pohlhaus et al., Acad Med 86:759, 2011*



MALE

NIH R01

- High prestige
- Scientific leadership
- Keen competition for scarce resources with high status

Agentic

- Role congruity for men
- Gender norm violation for agentic women



NIH K23

- Mentored (usually by senior male)
- Lower status than reviewers
- Lower budget
- Less competitive

Communal



FEMALE

- Status differential replicates societal gender roles



Study Section

NIH Director's Pioneer Awards

Awards to women scientists

- 2004 = 0/9
- 2005 = 6/13 = 43%
- 2006 = 4/13 = 31%
- 2007 = 4/12 = 33%
- 2008 = 4/16 = 25%
- 2009 = 7/18 = 39%

Semantic Priming in NIH Director's Pioneer Award?

2004

≥ 2005

Characteristics of target scientist and research

Risk-taking emphasized:

- “exceptional minds willing and able to explore ideas that were considered risky”
- “take...risks”
- “aggressive risk-taking”
- “high risk/high impact research”
- “take intellectual risks”
- application URL included “highrisk”

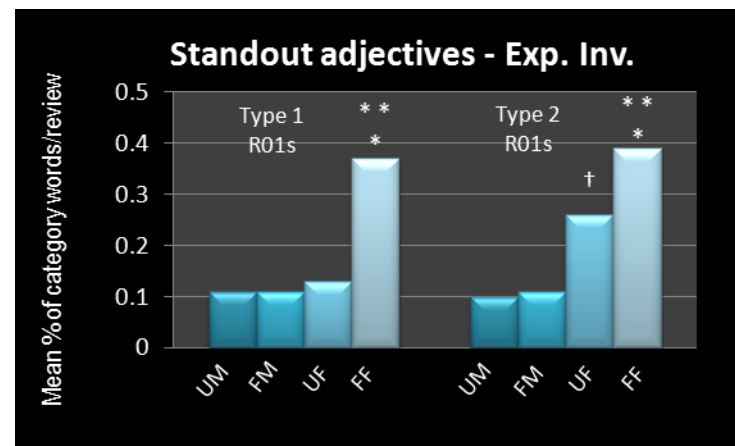
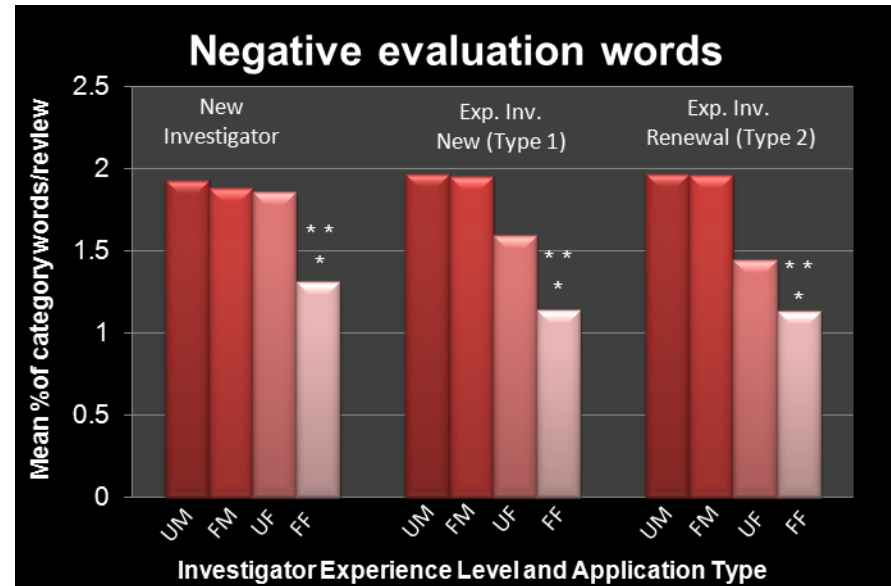
Emphasis on risk removed:

- “pioneering approaches”
- “potential to produce an unusually high impact”
- “ideas that have the potential for high impact”
- “highly innovative”
- URL no longer includes “risk”

Carnes et al. J Womens Health, 2005

Quantitative text analysis of R01 grant reviews

- 443 grant reviews from 65 of 75 awarded in 2008 with A1 or A2 proposals to PIs at UW-Madison
 - New/Type 1: 6 M, 5 F
 - Exp/Type 1: 19 M, 5 F
 - Exp/Type 2: 18 M, 12 F
- Text analyzed with LIWC for word categories relevant to gender (*Trix & Psenka, 2003; Schmader et al., 2007; Madera et al., 2009*)
- Developed 2 new categories for grant evaluation:
 - Negative (e.g. concern, underdeveloped, unsupported)
 - Positive (e.g. outstanding, innovative, novel) grant evaluation words
- Multifactorial mixed analysis of variance: no difference in applicant data
- Women's funded proposals have fewer negative words and more standout descriptors



Conclusion

Quantitative text analysis of R01 grant reviews is consistent with the requirement of higher confirmatory standards of competence for female scientists.

Cluster randomized trial of an educational
intervention for faculty in 90 Medicine,
Science, and Engineering Departments
(NIH R01 08847):

*Breaking the Prejudice Habit Through
Bias Literacy*

Progressive movement toward habitually *acting* without bias (and *feeling good* about it!)

Motivation to respond without prejudice¹

Low External
Low Internal

High External
Low Internal

High External
High Internal

High Internal
Low External



Stages of change – health behaviors²

Precontemplation > Contemplation > Preparation > Action > Maintenance



Adult learning^{3,4}

Unconscious
Incompetence

Conscious
Incompetence

Conscious
Competence

Unconscious
Competence

1. Plant & Devine, 1998
Devine, 1989
2. Prochaska & DiClemente, 1984
Carnes et al., 2005
3. Howell, 1982
4. Bandura, 1977

Workshop Format

- 2.5 hours
- 3 modules
 - Module 1: Implicit Bias as a Habit
 - Module 2: Identifying 6 Bias Constructs
 - Module 3: Strategies to Reduce the Influence of Implicit Bias
- Opportunities for active participation (“think-pair-share”, reader’s theater)

What is needed to change a habit?

Required	How workshop is addressing this
Recognition/ Motivation	<ul style="list-style-type: none">• IAT = demonstrate own implicit bias• Important to NIH, NSF, NAS
Self-efficacy	<ul style="list-style-type: none">• Literate in bias constructs & terms• Arm with theoretically informed, evidence-based strategies
Positive outcome expectations	<ul style="list-style-type: none">• Illustrate how these strategies can result in something you want
Deliberate practice	<ul style="list-style-type: none">• Write down a commitment to do so

Personal Bias Reduction Strategies

- Stereotype Replacement
- Counter-Stereotypic Imaging
- Individuating
- Perspective-Taking
- Increase Opportunities for Contact

Early Results

- Workshops individually for 36 departments/divisions
 - 32% attendance overall (13-94%)
 - Very useful = 80%
 - Somewhat or very useful = All
- 80% incorporated workshop elements in written commitments to promote gender equity
- At 3 months, biggest difference is in positive outcome expectations vs. control depts

Summary

- A gendered culture, mostly in unconscious ways, establishes expectations for women and their expectations for themselves
- Evidence suggests that stereotype-based cognitive bias negatively impacts women's career advancement in traditionally male fields, especially toward leadership in these fields
- We can work to minimize cognitive bias through institutional & environmental interventions and by helping individual men and women break their own bias habit by applying the same strategies we do to get our patients to stop smoking!

Thank you!