



# Faculty Recruitment - Best Practices: Searching for Excellence

Presenters today:

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National Science Foundation ADVANCE-IT 1409472



UD ADVANCE in partnership with:



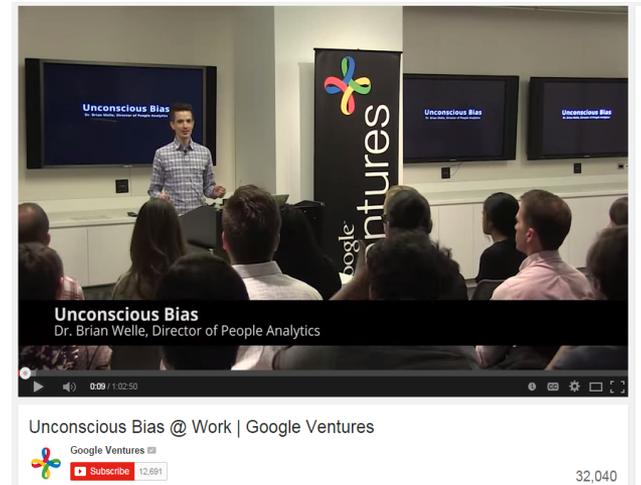
W I S E L I

Women in Science & Engineering Leadership Institute  
University of Wisconsin-Madison



# Search Committees

- Faculty hiring is one of the most important things we do
- It's not easy to do well
- NSF knows it (e.g., ADVANCE)
- Our peer universities know it (e.g., UW, UMich)
- Major companies know it (e.g., Google)
- We know it



<http://www.youtube.com/watch?v=nLjFTHTgEVU>



# Today's Plan

Identify a few key pitfalls

Learn best practices

***Help ensure we hire best faculty we possibly can  
...excellent scholars, teachers, leaders***



## Spoiler Alert!

### Four Main Points

- Diversity is important
- The UD College of Engineering is not as diverse as it could be
- One big reason is pervasive **Implicit Bias**
- Search committees can avoid **Implicit Bias** and improve diversity...Specific suggestions on how to do this



## Why is Diversity is Important?

- The right thing to do (?)
- Competitive advantage
- Increases creativity, innovation, new ideas
- Can better serve a diverse society
- Larger pool of talent to draw from
- Opportunity to distinguish UD

### Some types of diversity

#### Intellectual

- Expertise
- Disciplines
- School

#### Social

- Gender
- Age
- Race
- Religion
- Ethnicity
- Political orientation
- Sexual orientation
- Marital status
- Physical ability



# Why is Diversity is Important?

## Competitive advantage

- **S&P's Composite 1500 list, 1992-2006:**  
Female representation in top mgmt leads to increase of \$42 million in firm value, on average
- Companies that prioritized innovation saw even greater financial gains when women part of top leadership ranks

(Deszö, C. and Ross, D. 2012. Does female representation in top management improve firm performance? A panel data investigation. *Strategic Management Journal* 33, 1072–1089)

- **2,360 companies globally, 2005-2011:**  
Companies with  $\geq 1$  women on board delivered higher return on equity and better average growth

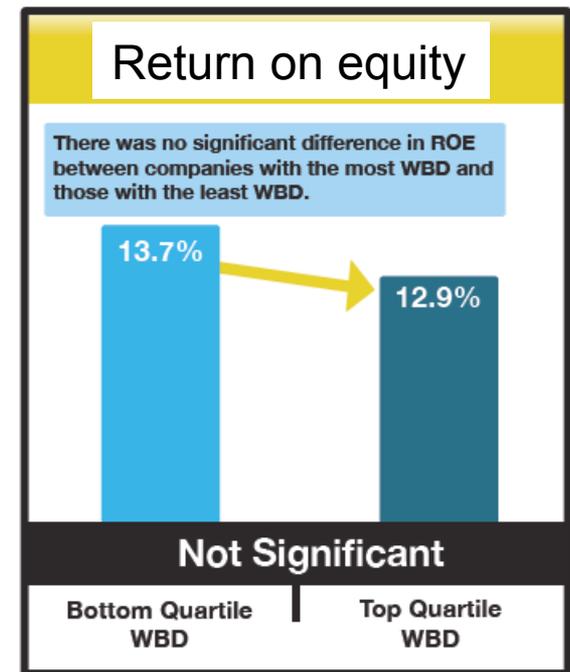
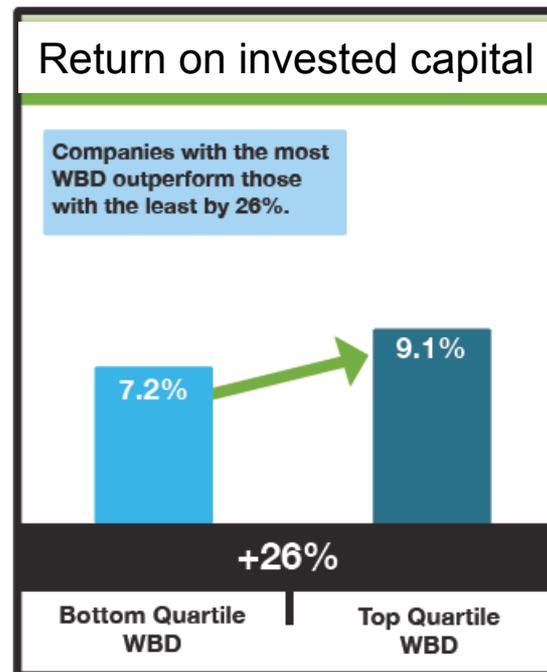
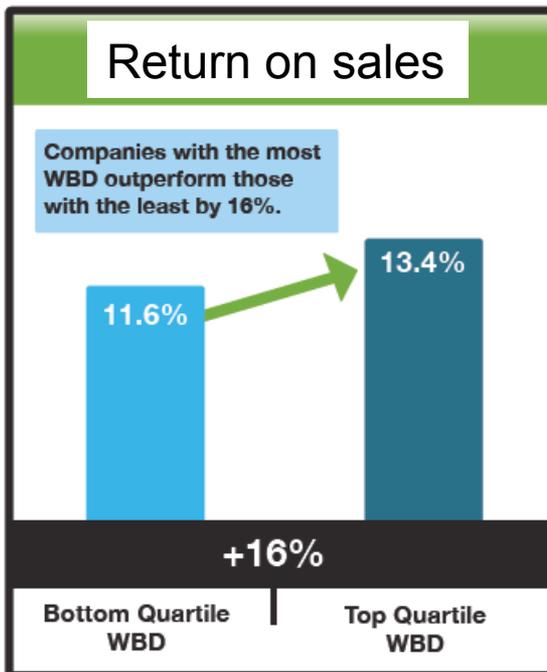
(Credit Suisse Research Institute. 2012. *Gender diversity and corporate performance*)



# Why is Diversity is Important?

## Competitive advantage

- Fortune 500 companies (2004-2008 data) WBD=women board directors  
(Catalyst. *The Bottom Line: Corporate Performance and Women's Representation on Boards*)

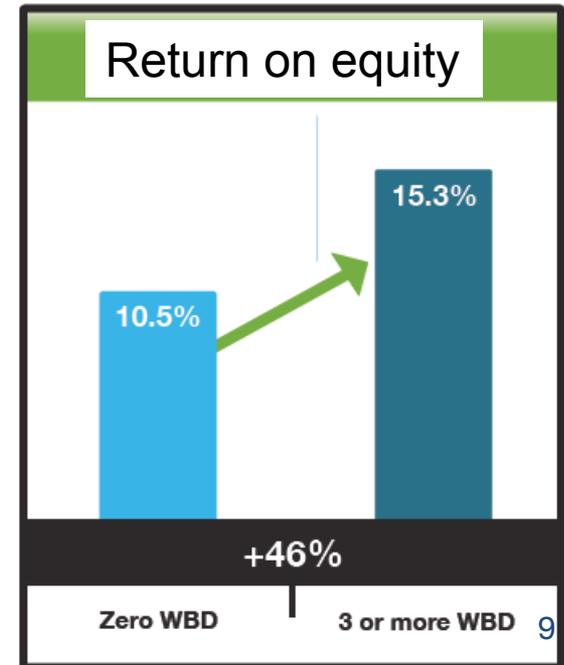
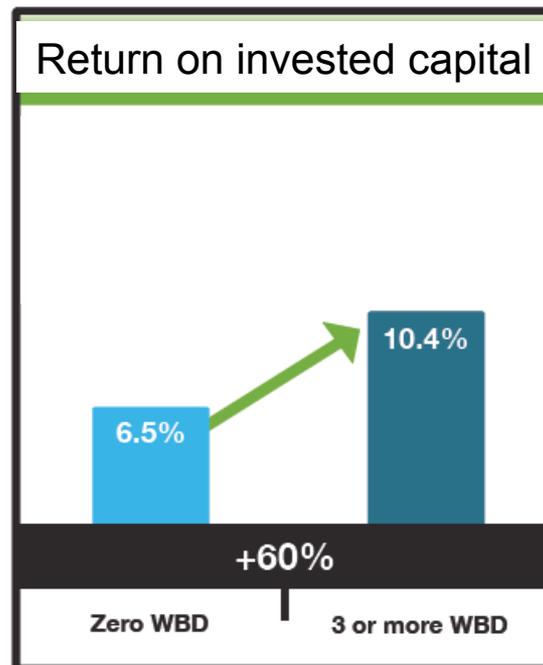
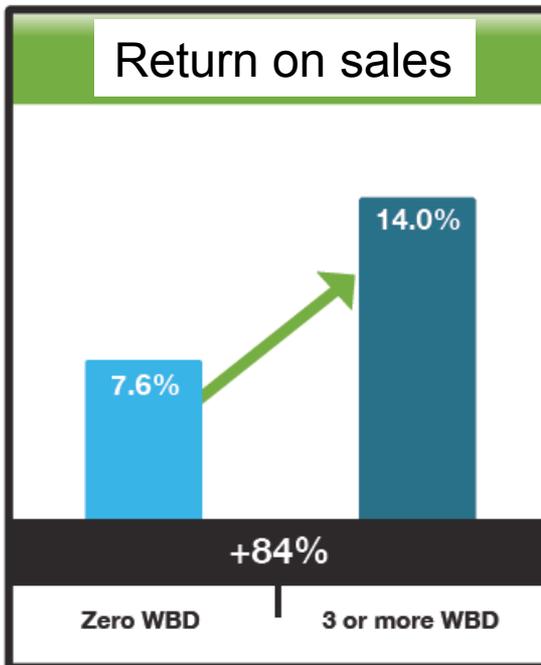




# Why is Diversity is Important?

## Competitive advantage

- Fortune 500 companies (2004-2008 data) WBD=women board directors





# Why is Diversity is Important?

## Competitive advantage

- Study of 2.5M scientific research papers  
Papers written by diverse ethnic groups (based on last names) receive more citations and are more likely to be in lower-impact journals, after controlling for many factors

(Freeman, R., and Huang, W. 2014. Strength in diversity. *Nature* 513, p305)





# Why is Diversity is Important?

## Increases creativity, innovation, new ideas

- Brings more perspectives to the table
- Also makes each person think/behave differently because
  - Expect greater challenge to ideas
  - Less likely to assume everyone agrees/understands each other
  - Small group dynamics altered





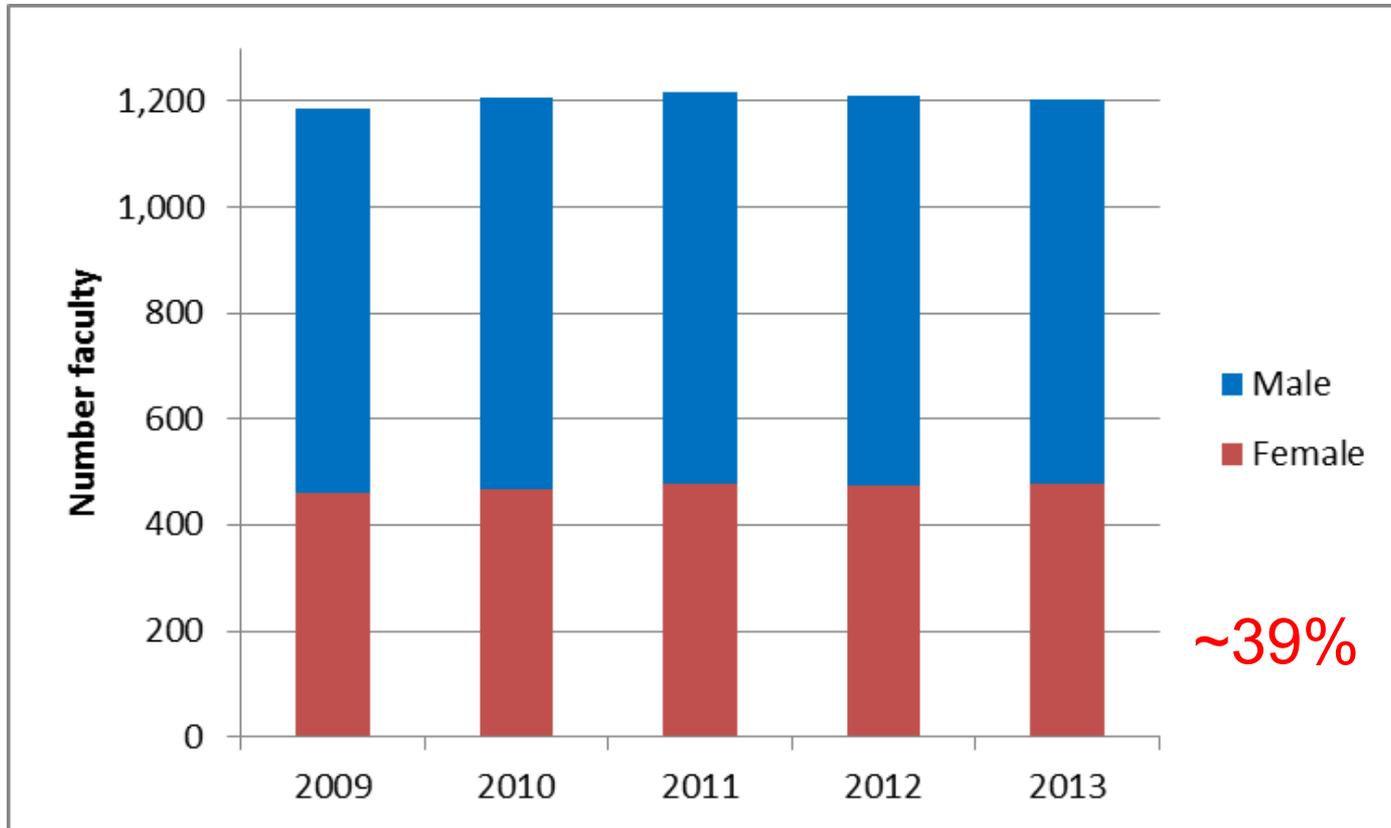
# Why is Diversity is Important?

- Can better serve a diverse society
- Larger pool of talent to draw from
- Opportunity to distinguish UD



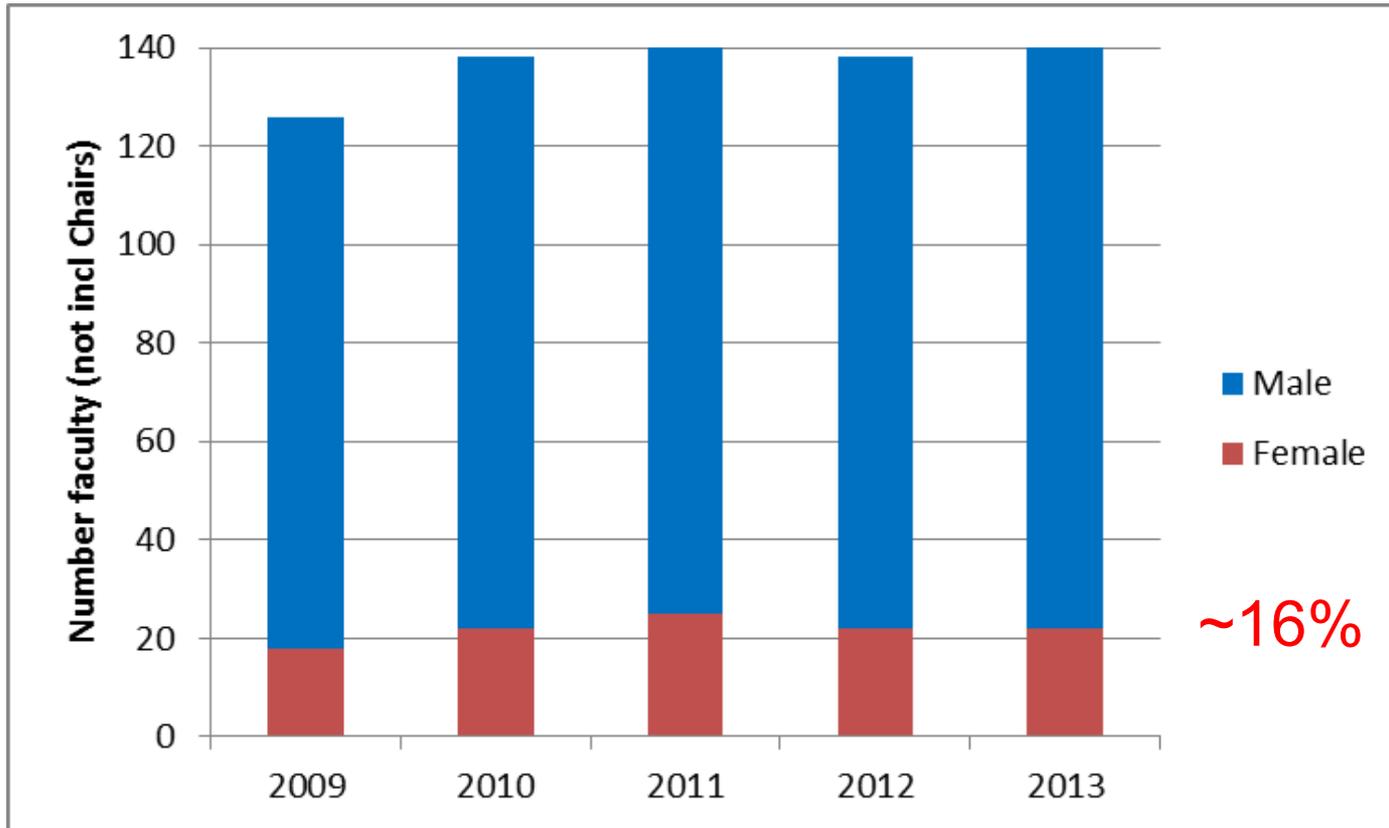


# How Diverse is UD?





# How Diverse is the UD College of Engineering?

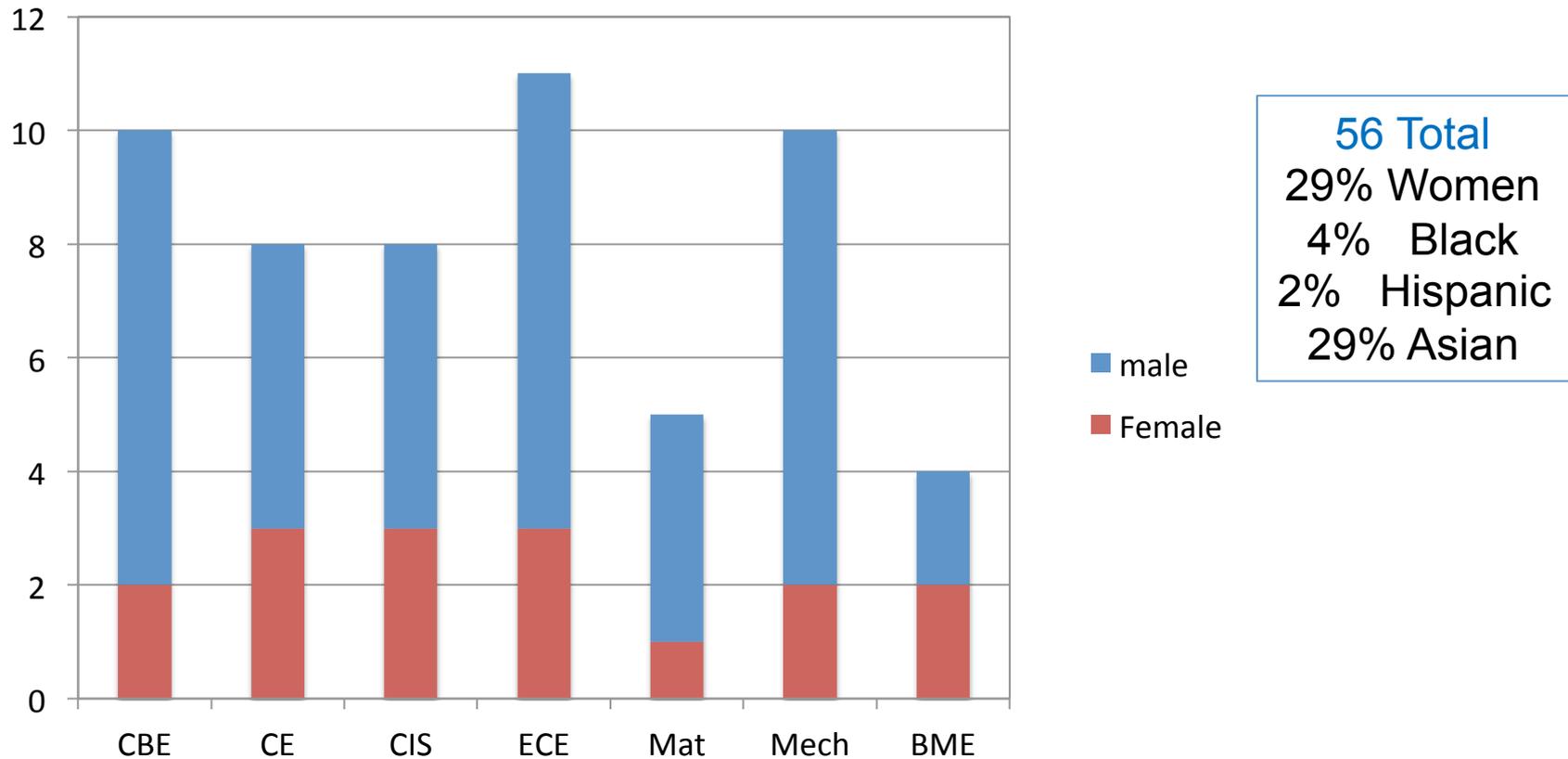


**2013 Undergrads**  
22% Women  
10% African-American or Hispanic

~16%



# COE Faculty Hired, 2005-2013



2006-2013: 49 Hires  
22% Women

2005: 5/7 hires were women!

*But at least 7 women have left in the same period*



## Why Aren't We More Diverse?

- MANY reasons
  - Interpersonal
  - Institutional
  - Cultural
- We'll focus on one particularly relevant for search committees



**Male**

**Female**



**Male**

**Female**

**Husband**



**Male**

**Female**

**Uncle**



**Male**

**Female**

**Grandpa**



**Male**

**Female**

**Son**



**Male**

**Female**

**Boy**



**Male**

**Female**

**Girl**



**Male**

**Female**

**Mother**



**Male**

**Female**

**Daughter**



**Male**

**Female**

**Grandma**



# Liberal Arts

# Science



**Liberal Arts**

**Science**

**Engineering**



**Liberal Arts**

**Science**

**Biology**



**Liberal Arts**

**Science**

**Music**



**Liberal Arts**

**Science**

**Chemistry**



**Liberal Arts**

**Science**

**Literature**



**Liberal Arts**

**Science**

**Geology**



**Liberal Arts**

**Science**

**English**



**Liberal Arts**

**Science**

**Humanities**



**Liberal Arts**

**Science**

**Physics**



**Liberal Arts**

**Science**

**Math**



**Female**

**or**

**Liberal Arts**

**Male**

**or**

**Science**



**Female**

**or**

**Liberal Arts**

**Male**

**or**

**Science**

**Music**



**Female**

**or**

**Liberal Arts**

**Male**

**or**

**Science**

**Mother**



**Female**

**or**

**Liberal Arts**

**Male**

**or**

**Science**

**Philosophy**



**Female**

**or**

**Liberal Arts**

**Male**

**or**

**Science**

**Father**



**Female**

**or**

**Liberal Arts**

**Male**

**or**

**Science**

**History**



**Female**

**or**

**Liberal Arts**

**Male**

**or**

**Science**

**Wife**



**Female**

**or**

**Liberal Arts**

**Male**

**or**

**Science**

**Engineering**



**Female**

**or**

**Liberal Arts**

**Male**

**or**

**Science**

**Son**



**Female**

**or**

**Liberal Arts**

**Male**

**or**

**Science**

**Chemistry**



**Female**

**or**

**Liberal Arts**

**Male**

**or**

**Science**

**Physics**



**Male**

**or**

**Liberal Arts**

**Female**

**or**

**Science**



**Male**

**or**

**Liberal Arts**

**Female**

**or**

**Science**

**Father**



**Male**

**or**

**Liberal Arts**

**Female**

**or**

**Science**

**Engineering**



**Male**

**or**

**Liberal Arts**

**Female**

**or**

**Science**

**Daughter**



**Male**

**or**

**Liberal Arts**

**Female**

**or**

**Science**

**Uncle**



**Male**

**or**

**Liberal Arts**

**Female**

**or**

**Science**

**Math**



**Male**

**or**

**Liberal Arts**

**Female**

**or**

**Science**

**Girl**



**Male**

**or**

**Liberal Arts**

**Female**

**or**

**Science**

**Literature**



**Male**

**or**

**Liberal Arts**

**Female**

**or**

**Science**

**Husband**



**Male**

**or**

**Liberal Arts**

**Female**

**or**

**Science**

**Physics**



## Implicit Association Test

Tony Greenwald, U. of Washington

Mahzarin Banaji, Harvard University

Brian Nosek, U. of Virginia

75% subjects feel that last set of associations are more difficult/take more time to answer

<https://www.projectimplicit.net>



## What are “Implicit” Assumptions?

- **Cognitive shortcuts** that we use to evaluate people and groups
- Stereotypes or expectations that we resort to in unfamiliar situations
- Ways of judging others

## What do they Permit Us to Do?

- Process information quickly (even if inaccurately)
- Make snap judgments
- Bypass consciously held or “explicit” attitudes



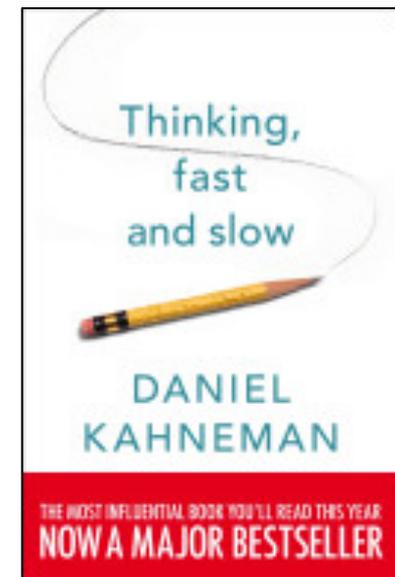
## System 1 vs System 2

“The workings of the mind [can be described] as an uneasy interaction between two fictitious characters: the automatic System 1 and the effortful System 2.”

“System 1 is designed to jump to conclusions from little evidence – and it is not designed to know the size of its jumps.”

“The attentive System 2 is who we think we are. System 2 articulates judgments and makes choices, but often endorses or rationalizes ideas and feelings that were generated by System 1.”

“Often we make mistakes because we (our System 2) do not know any better.”

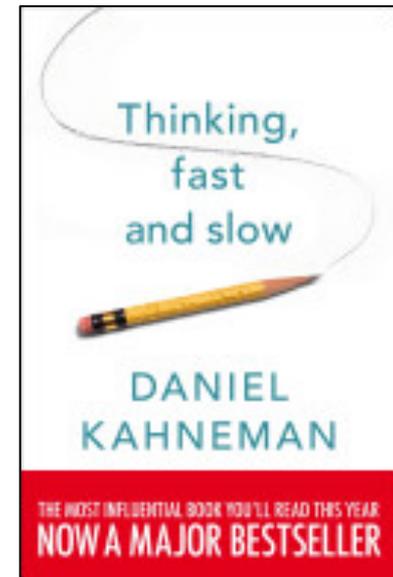




# The Upside of Cognitive Shortcuts

Our brains manage their resources by using what we already know to contextualize new information. We use cues to focus our attention on what is salient:

- Facilitates learning new tasks
- Reduces decision-making time
- Enables multi-tasking
- Simplifies life

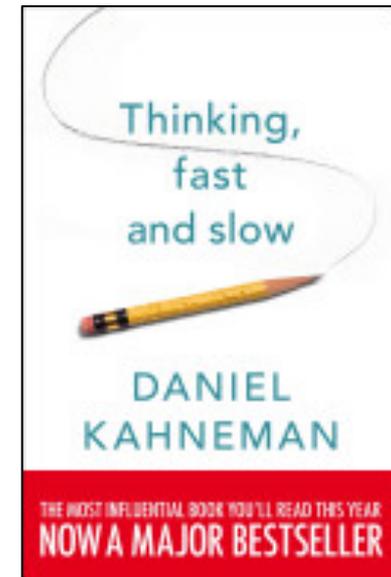




# The Downside of Cognitive Shortcuts

We do not recognize when our intuition and decisions are based on incomplete information or biased by irrelevant factors.

We are especially likely to use cognitive shortcuts under high stress and limited information conditions – exactly the conditions under which we most need to engage our maximally-rational System 2.

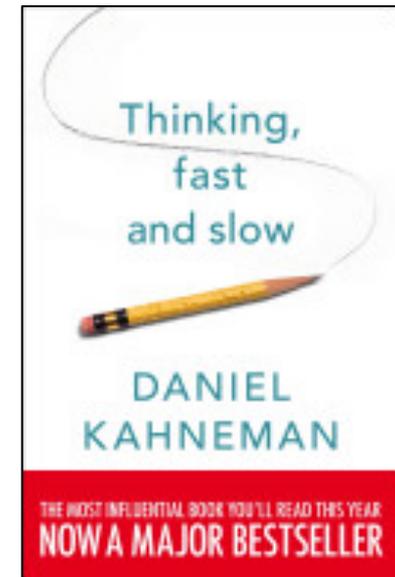




# The Downside of Cognitive Shortcuts

Can lead us astray and can have inconvenient consequences (*especially in our complex, fast-paced modern society*)

Implicit biases





What's the evidence?



## Swedish Medical Research Council Postdoc:

Authors noticed:

- 46% of applicants were women (114 total).
- 20% of awardees were female.

Took the case to court, acquired access to applications. Assigned applicants “Impact Score” based upon publication record.

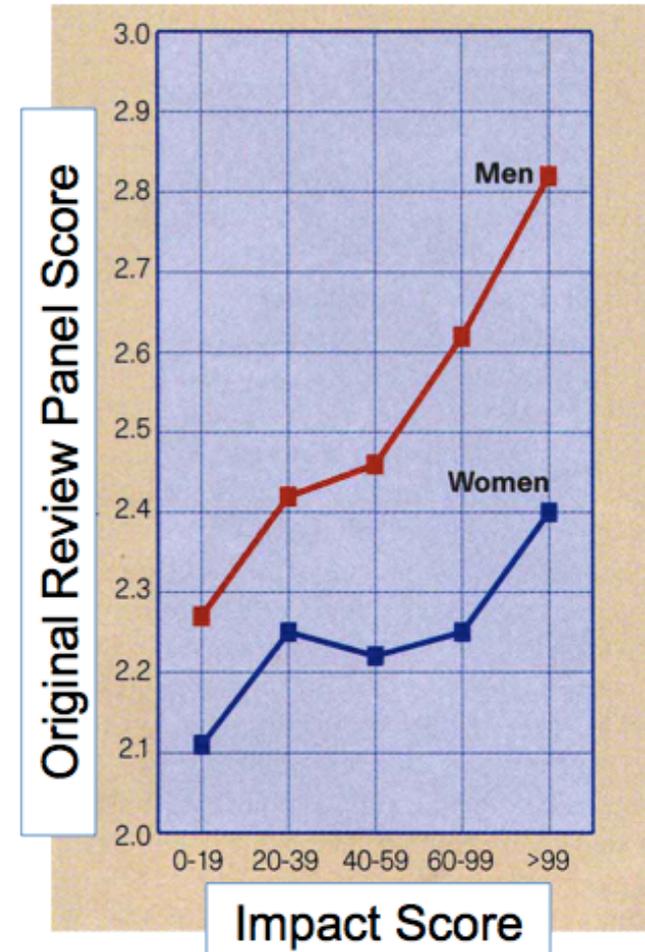
### Results

**Males: linear relationship** (suggests original review panel used objective criteria).

**Females: nonlinear relationship**, and lower original score.

### Summary

Women had to be **2.5 times** as productive as men to be ranked the same.





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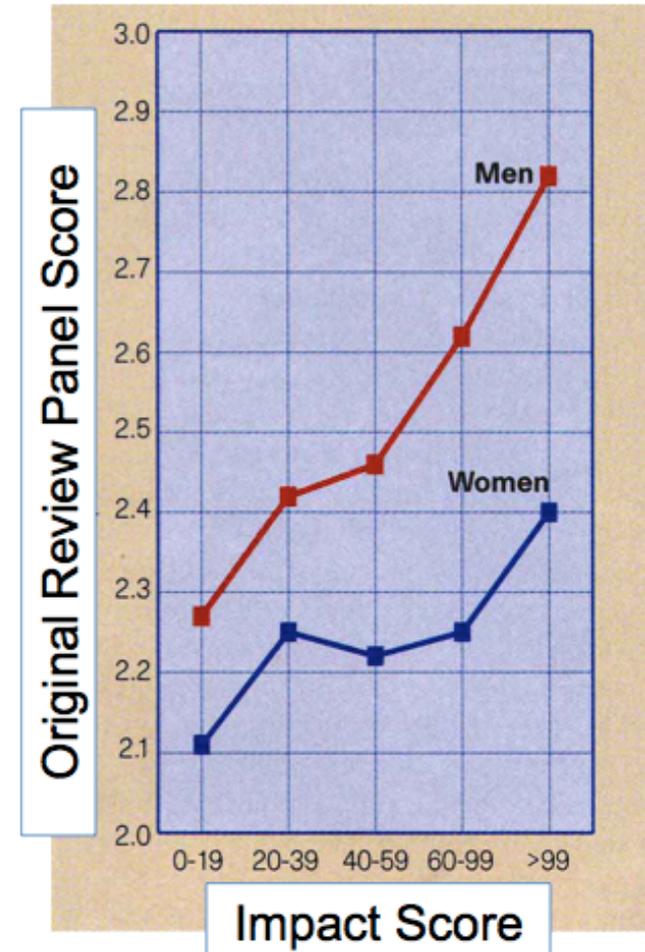
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### Summary

Women had to be **2.5 times** as productive as men to be ranked the same.

AND, for men or women,

**Affiliation with a member of the review panel gave a comparable advantage.**



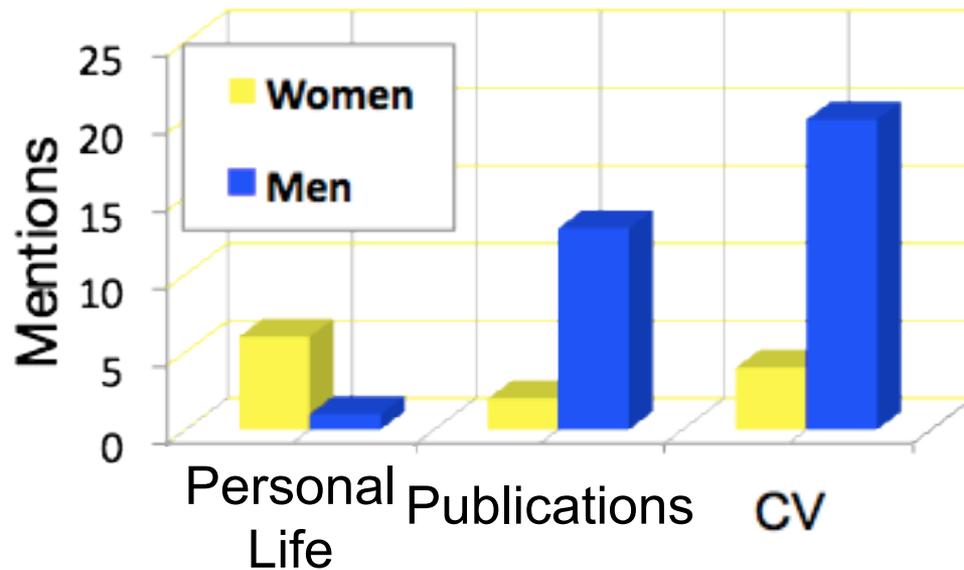


# Letters of Recommendation

Successful Medical School Faculty Applicants

300+ letters

Large U.S. med school mid-1990s



Trix, F. & Psenka, C. (2003) *Discourse & Society*, 14(2); 191-220.

## Letters for women:

- Shorter
- “Mary” instead of “Dr. Smith”
- Greater focus on **teaching, personal life**
- More “doubt raisers,” such as: “It’s amazing how much she’s accomplished” and “It appears her health is stable.”

## Letters for men:

- Longer
- “Dr. Smith” instead of “Larry”
- More references to **publications and research**



## Studies: Gender Bias in Evaluation

- Psychology professors prefer 2:1 to hire “Brian” over “Karen,” even when the application packages are identical. Employers also prefer to hire “Brendan” over “Jamal.”

(Steinpreis, Anders, and Ritzke (1999) *Sex Roles*, 41, 509)  
(Bertrand, et al., MIT Dept. Economics Working Paper No. 03-)

- “Blind” auditions increased the percentage (25-46%) of women winning orchestral jobs and increased the probability that women would advance out of preliminary rounds.

(Goldin and Rouse (2000) *The American Economic Review*, 90, 4, 715-741)

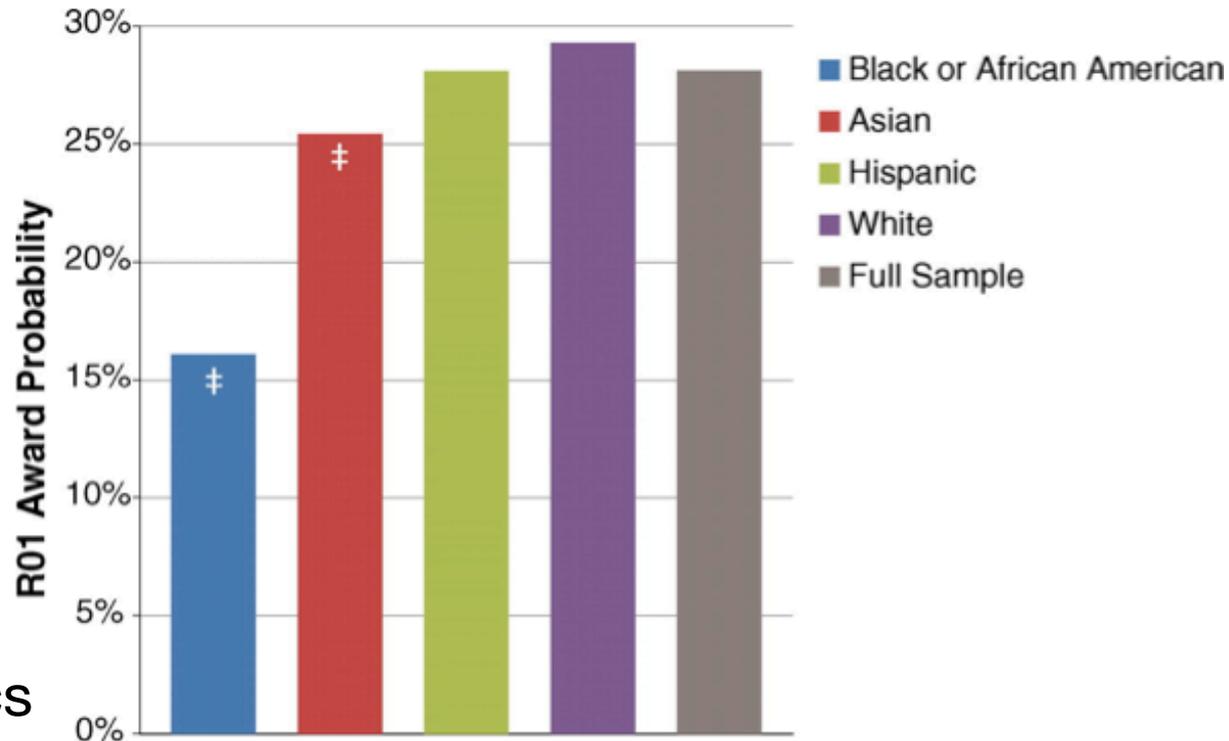
- Double-blind review of journal articles yields 7.9% increase in proportion of papers with a female first author.

(Budden, et al., *TRENDS in Ecology and Evolution* Vol.23 No. 1)



# NIH Awards: Race and Ethnicity

~83,000 proposals (2000-2006)



Study controlled for:

- demographics
- education and training
- employer characteristics
- NIH experience
- research productivity



## NIH Awards: Race and Ethnicity

Why do you think the award rate is 16% for Black or African American proposals when it is 29% for those proposals submitted by White PIs?

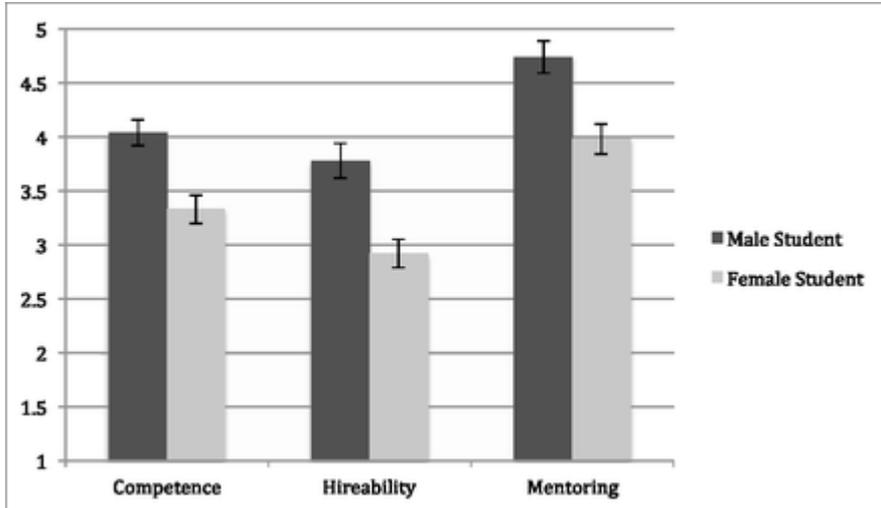
Authors noticed that black faculty members were less likely than white faculty members to resubmit grant proposals after receiving a rejection, which decreased their overall success rate.



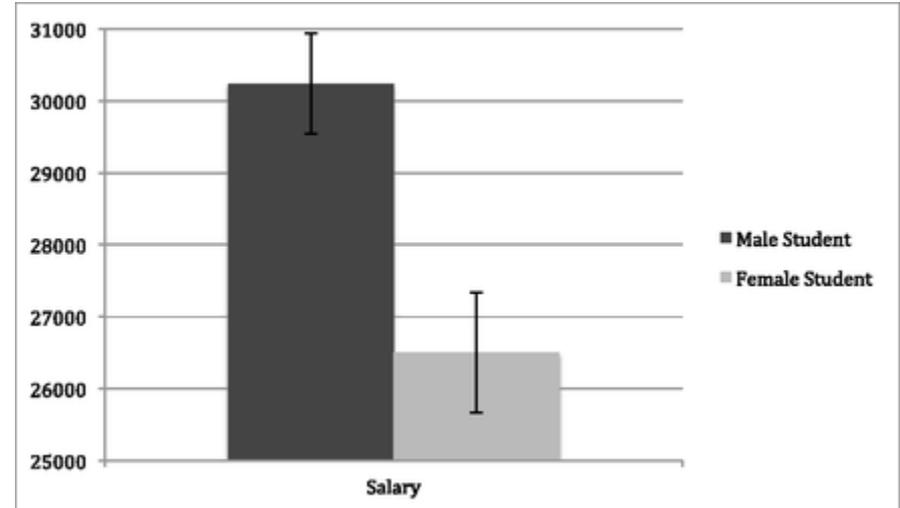
# Hiring a Lab Manager

Sent 127 biology, chemistry, and physics professors application for a science lab manager position.

1/2 had male name; 1/2 had female name; otherwise identical



Scale 1 to 7. All diffs significant ( $P < 0.001$ )



Significant ( $P < 0.01$ )



## Hiring a Lab Manager

Two additional important points...

1. Male and female scientists equally likely to exhibit gender bias
2. When scientists judged female applicants more harshly, they did **NOT** use sexist reasoning to do so



# Police Chief

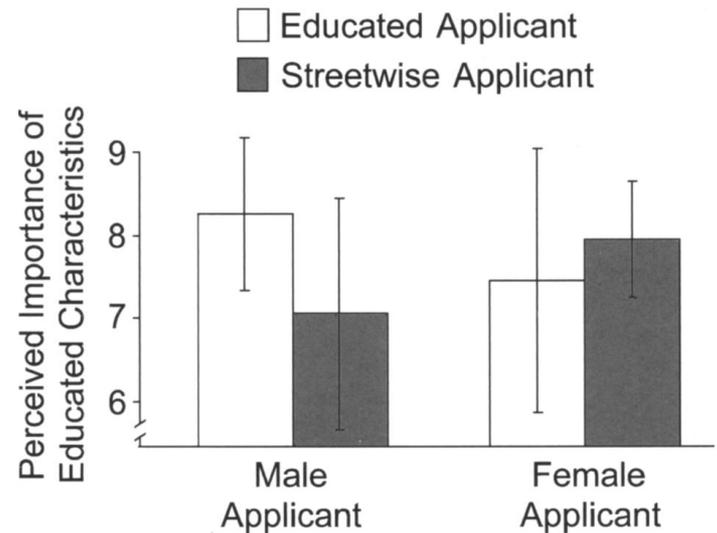


Heather Fong served as San Francisco's chief of police, 2004-2009. (Source: Wikimedia commons)

- Participants asked to evaluate candidates for police chief
- Male vs. female name
- Educated vs. streetwise

Gender had no effect on perceived strength of each criteria, but still preferred male...

Participants unconsciously shifted their evaluation criteria—favoring education or experience—to justify hiring the male candidate.

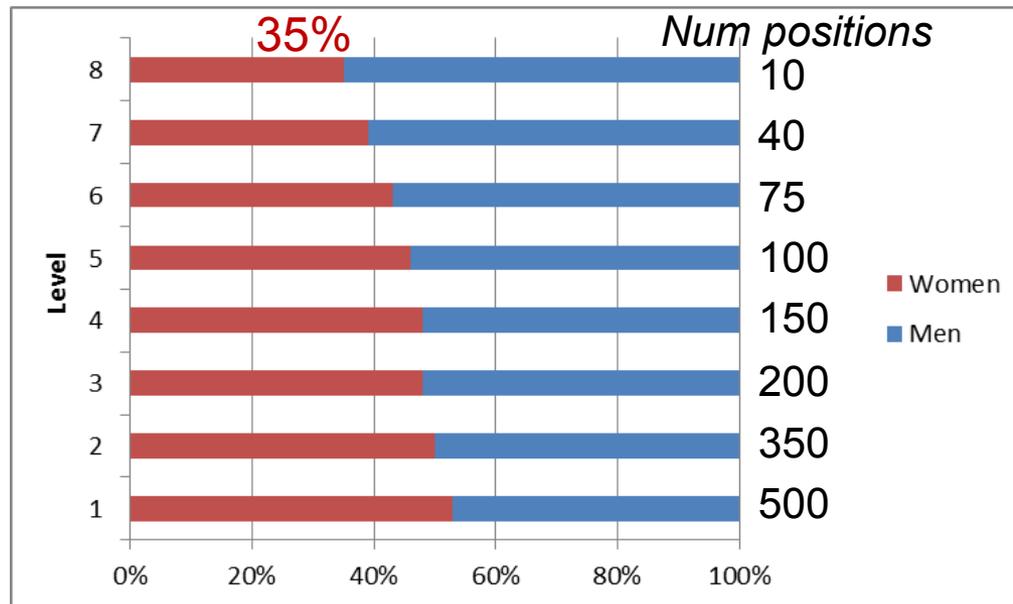


More self-identify as objective → more biased

Scale 1 to 11



# Do Small Biases Really Matter?



- Simulated promotion through a company; promote from within only
- Normally distributed performance scores, with small bump for men (accounting for just 1% of variance)
- **Small effects add up!**



# Research shows that, regardless of our explicit beliefs, we all apply implicit assumptions

## *especially when:*

- We lack information
  - We are under stress
  - We experience time pressure
  - We are distracted
  - We see only one or two individuals from the group we are judging
- 
- **Both** women and men hold them about gender.
  - **All people** make them about race and ethnicity (even their own).



Deeply ingrained in the culture of academic science is the assumption that merit, as revealed by the purportedly objective process of peer review, determines the distribution of status, rewards, and opportunities.

. . . Research, however, has shown that gender colors evaluation of scientific and engineering accomplishment and thus affects the opportunities and rewards that women receive. In the intense competition for academic standing, even small differences in advantage can accumulate . . . and create large differences . . .

*Valian, Why so Slow: The Advancement of Women, MIT Press, 1999*



# Best Practices for Faculty Searches

- “The way to block errors that originate in [unconscious bias] is simple in principle: recognize the signs that you are in a cognitive minefield, slow down, and ask for reinforcement from System 2... Unfortunately, this sensible procedure is least likely to be applied when it is needed most.”
  - Daniel Kahneman, Nobel Laureate in Economics, *Thinking Fast and Slow*
- Best practices for faculty searches maximize the engagement of “System 2” and minimize both the unconscious influence of “System 1” and common cognitive errors that unintentionally, and often unknowingly, influence decisions.



# Numerical evaluations of candidates

- Use of numerical scores minimizes intuitive and substitutional answers known to be prone to implicit bias.
- Search committee should:
  - Identify no more than 6 categories for numerical evaluation
  - Establish formula with relative weights for each category
  - Agree on normalizing criteria
- Search committee members should NOT have access to other's scores until they have completed their own evaluation



# Optimize conditions for evaluation

- Distractions, including exhaustion, hunger and time pressure, maximize the probability that you will unconsciously default to intuitive, and often unjustified, conclusions.
- Randomize the order of candidate applications for each reviewer
- Structure your internal evaluation to maximize comparisons
  - Do I think candidate X is likely to be a better hire than candidate Y?  
Do my scores reflect this?
  - Joint comparisons minimize probability of error relative to isolated single evaluations



## Making the final decision

- Every evaluator should write and submit in advance a very brief summary of their position and rationale for prioritizing their top choice
  - “The standard practice of open discussion gives too much weight to the opinions of those who speak early and assertively, causing others to line up behind them.” **Confirmation Bias**
- Discussion should intentionally be structured to consider:
  - Regression to the mean



## Regression to the Mean

Perhaps the most valuable contribution of the corrective procedures I propose is that they will require you to think about how much you know. I will use an example that is familiar in the academic world: A department is about to hire a young professor and wants to choose the one whose prospects for scientific productivity are the best. The search committee has narrowed down the choice to two candidates:

Kim recently completed her graduate work. Her recommendations are spectacular and she gave a brilliant talk and impressed everyone in her interviews. She has no substantial track record of scientific productivity.

Jane has held a postdoctoral position for the last three years. She has been very productive and her research record is excellent, but her talk and interviews were less sparkling than Kim's.

-Kahneman, *Thinking Fast and Slow*



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- Discussion should intentionally be structured to consider:
  - Regression to the mean
  - Framing effects: Are evaluative questions framed as positives or negatives? Are you using the same frame for every candidate?
  - **Availability bias**: Are you asking for the same number of positive and negative examples for each candidate?
- Verify that you are evaluating candidates against the criteria you set in advance. Avoid **unconscious shifts of your evaluation criteria**



Thank You!

Good luck with your searches!