Procedures that activate or mitigate gender bias in scientific review

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What is “unconscious bias”

- Unconscious bias and assumptions
- Previously held beliefs about a social category
- Schemas
- Stereotypes
- Mental models
- Cognitive shortcuts
- Statistical discrimination
- Implicit associations
- Spontaneous trait inference

The tendency of our minds to judge *individuals* based on characteristics (real or imagined) of *groups*

Background on Gender

DESCRIPTIVE: How men and women actually behave

PRESCRIPTIVE: Unconscious assumptions about the way men and women in the abstract "ought" to behave:

- Women: Nurturing, nice, supportive, helpful, sympathetic, dependent = generally less valued in society (i.e. paid for)
- Men: Decisive, inventive, strong, forceful, independent, "willing to take risks" = generally more valued

RELEVANT POINTS:

- Leaders, physicians, scientists, professors: Decisive, inventive, strong, independent
- Social penalties for violating prescriptive gender assumptions
- Unconscious gender stereotypes are easily and automatically activated and once activated readily applied

Consistent story in field and experimental studies over several decades –

- Women and the work performed by women receive lower evaluations than men and the work performed by men – even if the work is *identical* – multiple studies: e.g. Heilman, 2004; Wenneras and Wold, 1997; Steinpreis, 1999
- Sex of the evaluator makes no difference – i.e. *both* men and women give women lower evaluations – nearly universal
- Women are particularly disadvantaged at evaluation points advancing to high authority positions, especially elite leadership positions – multiple studies; e.g. Sczesny et al., 2006
- Women, but not men, who self-promote receive lower evaluations – Several studies; e.g. Rudman, 1998
- Those who think they have no biases provide the most biased evaluations – Uhlmann and Cohen, 2005
- Letters of recommendation for recruited faculty are significantly different for female vs male applicants – Trix and Psenka, 2003

We all have gender-biases (conscious or unconscious) and they would be predicted to disadvantage women in their academic career advancement

Conditions which activate gender bias in evaluation to the detriment of women

- Time pressure and high cognitive load
- Small number of women in applicant pool or review group
- Ambiguous performance criteria for traditionally male position (e.g. “potential” “shows leadership”)
- “Feminine” appearance or scent (even among men)
- Use of abstract rather than concrete language to describe attributes (e.g. “he broke a test tube” “she is clumsy in the lab”)
- Semantic priming with gender-linked words

Taking an Evidence-Based Approach:
Interventions in at least one randomized, controlled study that mitigate bias in evaluation

Intervention	Example of study
Reduced time pressure and cognitive distraction during evaluation	Martell RF. J Applied Soc Psychol, 21:1939-60, 1991
Presence of a member of the social category being evaluated	Lowery et al. J Pers Soc Psych 81:842, 2001
At least 25% women in the pool being evaluated	Heilman ME. Organ Behav Hum Perf 1980; 26: 386-395, 1980
Instruction to try to avoid prejudice in evaluation	Blair IV, Banaji MR. J Pers Soc Psychol 70:1142-1163, 1996
Counterstereotype imaging	Blair IV, Ma JE, Lenton AP. J Pers Soc Psychol 81: 828-841, 2001
Establishing the value of credentials before any applicant is seen to avoid "redefining" merit	Uhlmann and Cohen, Amer Psychol Assoc 16:474-480, 2005

Type 2 translational social science research: can we apply it to academic institutions?

- Language activating unconscious gender-linked bias in evaluation through *semantic priming*?
  - NIH Director's Pioneer Award
  - Tenure criteria
- Changing faculty attitudes and behaviors through workshops for search committees

NIH Director's Pioneer Award

- First NIH Roadmap initiative to be rolled out
- Intended to accelerate innovative research unsupported through traditional NIH funding mechanisms
- $500,000/yr for 5 years
- None of 9 awarded first round were women
- Women: 6/14 second round (43%); 4/13 third round (31%); 4/12 fourth round (25%)

Carnes, et al. JWH, 2005

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" • URL includes "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"
Goals of research to be supported	
Technological advances highlighted as desirable: • "support the people and projects that will produce tomorrow's conceptual and technological breakthroughs"	**Mention of technological breakthroughs removed; human health added:** • "encourage highly innovative biomedical research with great potential to lead to significant advances in human health."

“Leader” in tenure criteria

- 25 top research academic medical centers
- Tenure criteria from websites
- Scanned for “Leader”
- Also scanned for other Bem Sex Role Inventory male, female, neutral words
- Slopes of regressions for annual % faculty who are tenured women x 7 years
- “Leader” = OR 6.0 (1.02, 35.37; p=0.04) for slope below median compared to those without

Marchant et al. 2007

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

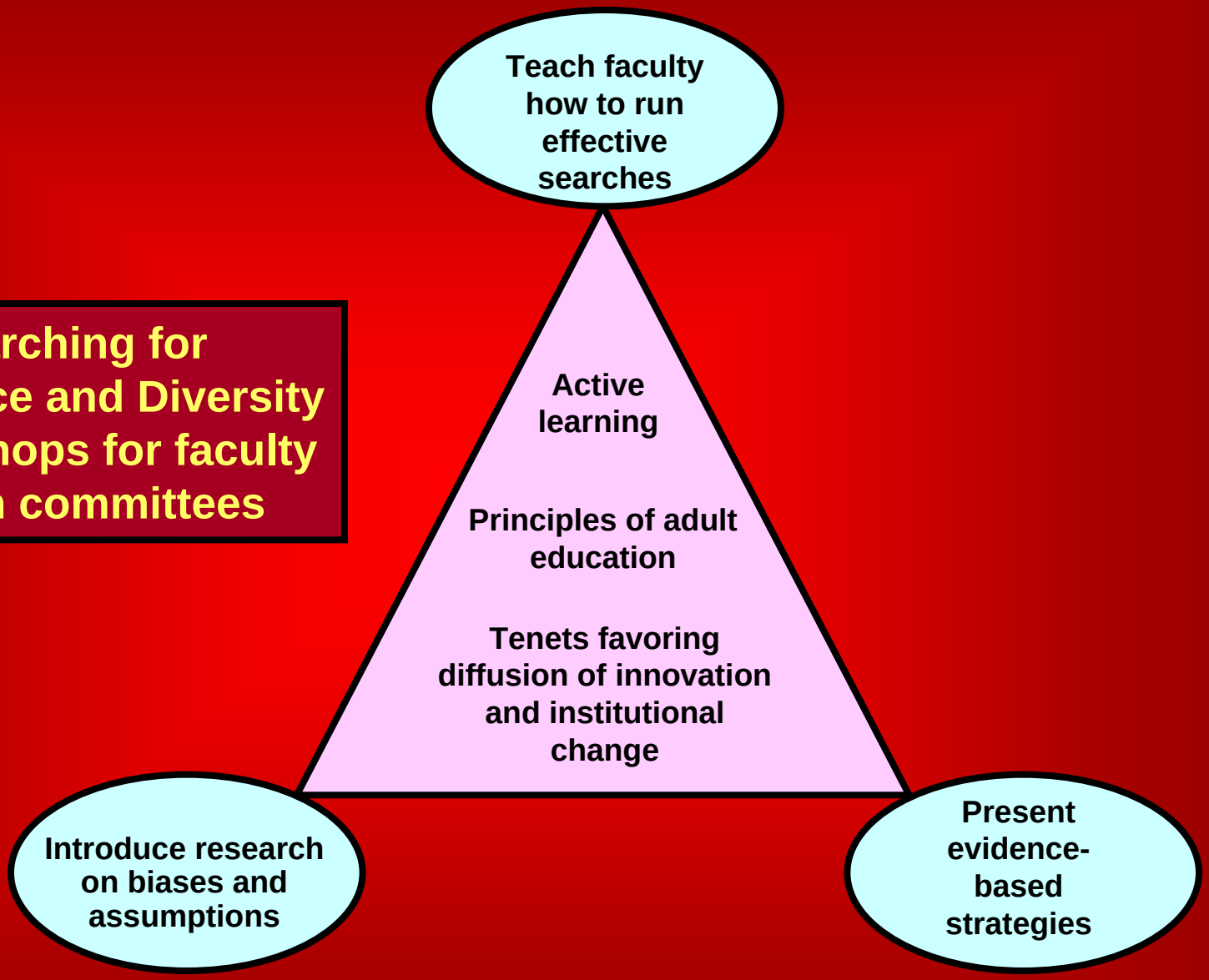
Female

Sensitive
Understanding
Yielding

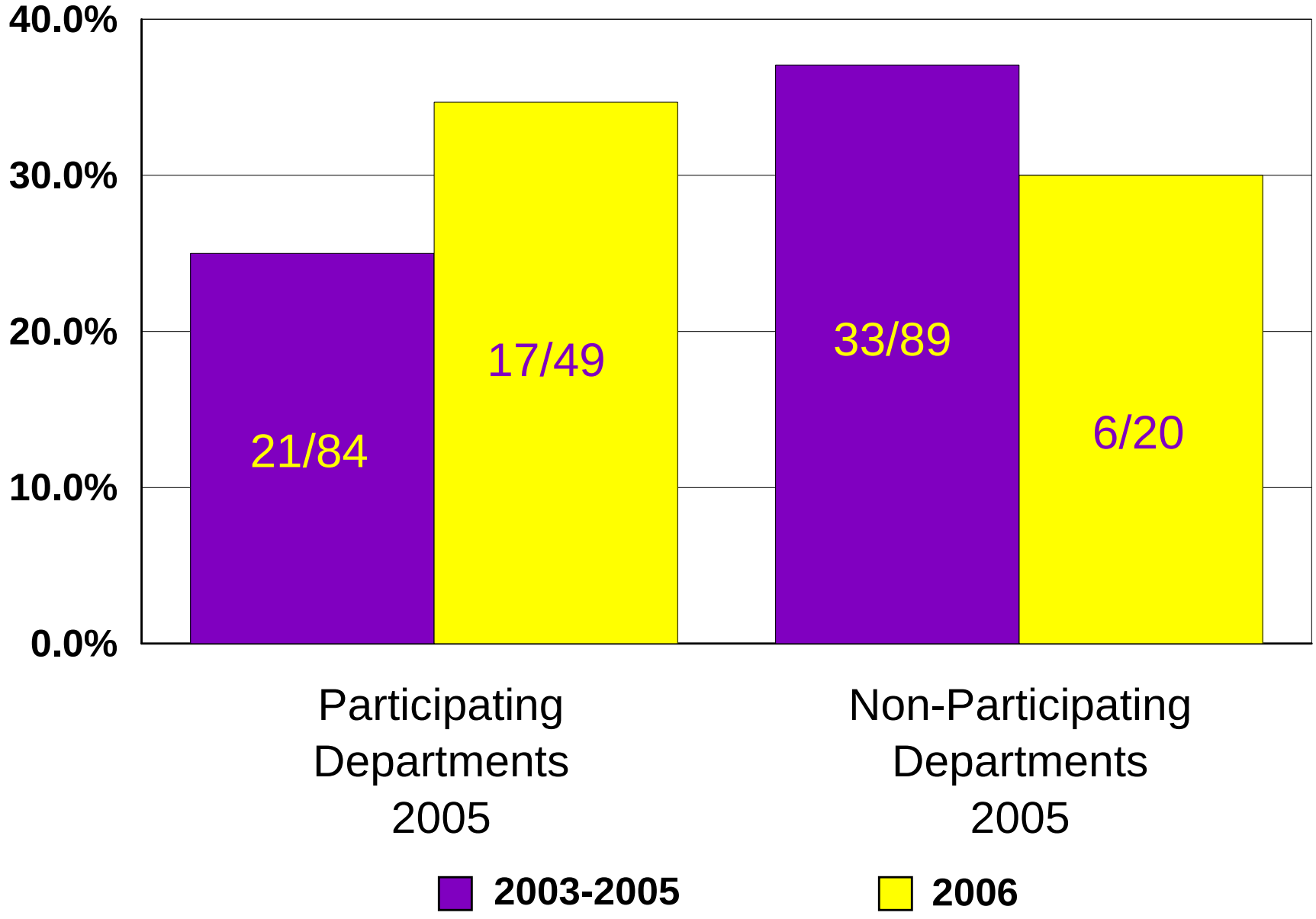
3 schools

Total 3

Searching for Excellence and Diversity – Workshops for faculty search committees

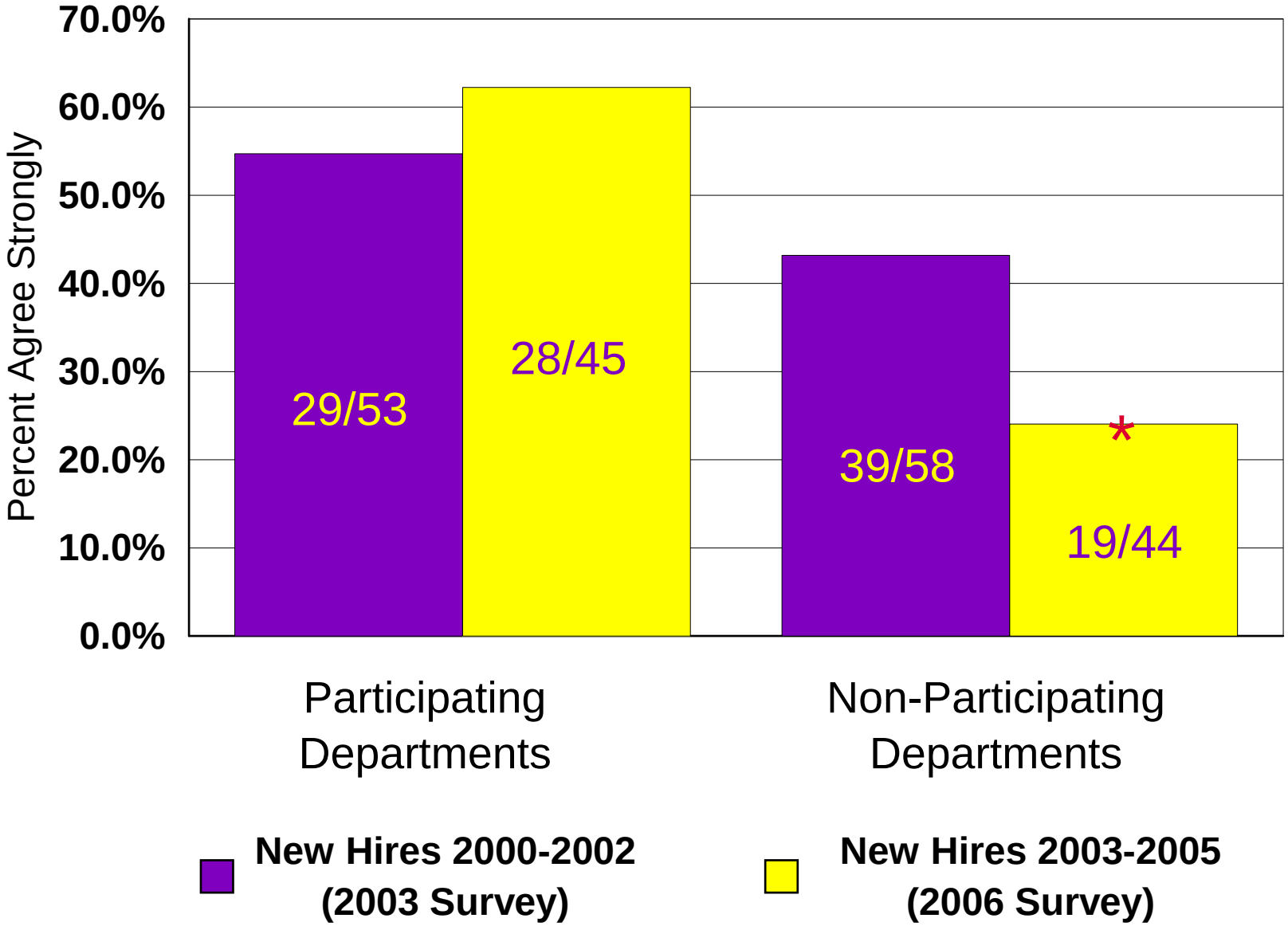


Percent Female, New Tenure-Track Faculty
Biological & Physical Sciences



New Hires' Satisfaction* With the Hiring Process

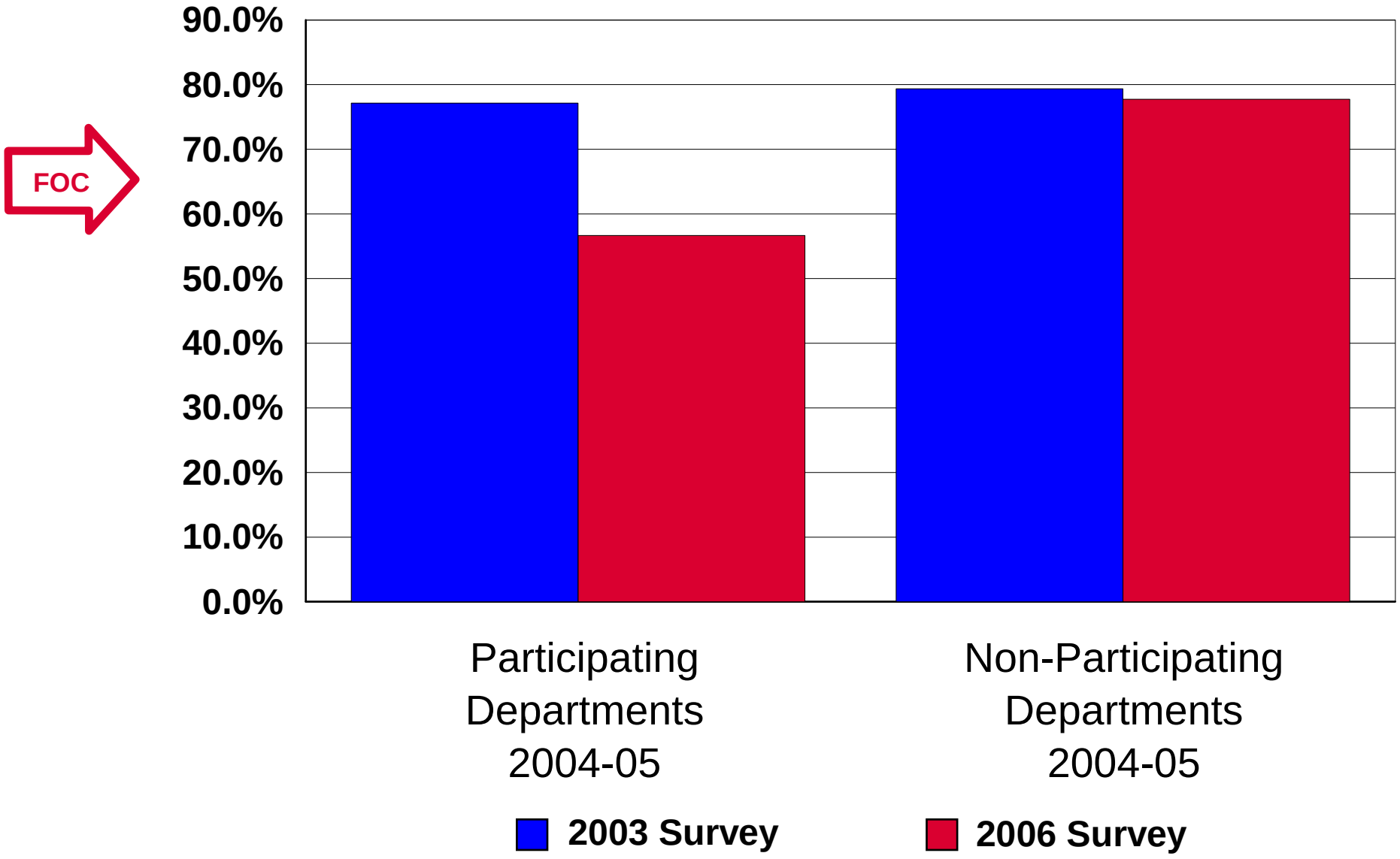
Biological & Physical Sciences



* Agree Strongly to the item "I was satisfied with the hiring process overall."

The Climate for Faculty of Color is Good

Biological & Physical Sciences



Summary

- Gender-linked unconscious biases and assumptions are ubiquitous
- These disadvantage women in academic medicine whenever evaluation is required (e.g. receiving awards, tenure)
- Evidence from randomized, controlled studies indicates that activation and application of these biases can be mitigated
- Our work suggests that exposing faculty to this area of social science research may increase the number of women faculty recruited and appears to change perceptions of departmental climate for faculty of color