



W I S E L I

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

# Project to Assess Climate in Engineering (PACE)

Selected Results from UW-Madison



# PACE Study

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- Motivation

- “The goal is to identify and address university climate issues to improve retention for all undergraduate engineering students”
  - Special emphasis on women and under-represented minority students
  - Provides benchmarking with other “peer” universities



## PACE Study

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- PI is Suzanne Brainard at the University of Washington
- 24 Engineering schools participated
  - University of Wisconsin-Madison and University of Washington participated on a pilot basis—student survey only
- Funded by Alfred P. Sloan Foundation and The Engineering Information Foundation



# PACE Survey Content

- **Academic experiences**
  - Satisfaction with teaching
  - Satisfaction with professors
  - Satisfaction with TAs
  - Satisfaction with resources
- **Interpersonal experiences**
  - Interactions among students
  - Participation in student organizations
  - Experiences based solely on gender or race/ethnicity
- **Intrapersonal experiences**
  - Confidence
  - Career goals
- **Perceptions of Engineering**
- **Experiences of Transfer Students**



## Response Rates

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- Overall response rate: 36.3%
  - Women over-represented
  - Most non-white racial/ethnic groups under-represented
  - Freshmen over-represented/Seniors and super-seniors over-represented
- N=1,082

**Table 1. Characteristics of PACE Sample, UW-Madison**

	<u>PACE Respondents</u>	<u>All CoE Students</u>
<b>Gender</b>		
Female	24.4%	17.5%
Male	75.6%	82.5%
<b>Race/Ethnicity</b>		
African American/Black	1.3%	1.8%
American Indian/Alaska Native/Native	1.1%	0.7%
Hawaiian/Pacific Islander		
Asian American/Asian	3.8%	6.3%
Hispanic/Latino	1.6%	2.4%
White/Caucasian	75.5%	78.5%
Other/Unknown	11.9%	3.2%
International Student	4.8%	7.2%
<i>Targeted Minority</i>	4.8%	6.4%
<b>Rank</b>		
Freshman	23.3%	10.4%
Sophomore	22.9%	21.9%
Junior	21.3%	24.8%
Senior+	32.4%	41.0%
<b>Mean GPA</b>	2.83	3.11
High GPA*	37.0%	27.5%
<b>Transfer Student</b>	10.9%	11.3%
<b>Student Works</b>	58.5%	Unknown
<b>Financial Need</b>	14.9%	Unknown
<b>CoE Student Organization</b>	40.2%	Unknown

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\* A High GPA is defined as 3.5 or higher.



# Analysis

- Analysis variables:
  - Gender, Race/Ethnicity, Class Year, GPA, Transfer Status, Financial Need/Student Works, CoE Student Organization Membership
- Within-CoE comparisons
  - T-tests, differences between means
  - $p < .05$  for significance
  - Open-ended responses to highlight significant findings
- CoE vs. peer institutions
  - Purdue University, University of Michigan, Pennsylvania State University
  - Response rates are 35%, 33%, and 23%
  - Only means reported. Differences between peers and UW-Madison are considered “significant” if a  $\pm 0.2$  difference in means was reported for at least two of the schools (in the same direction)

# Ten Major Findings

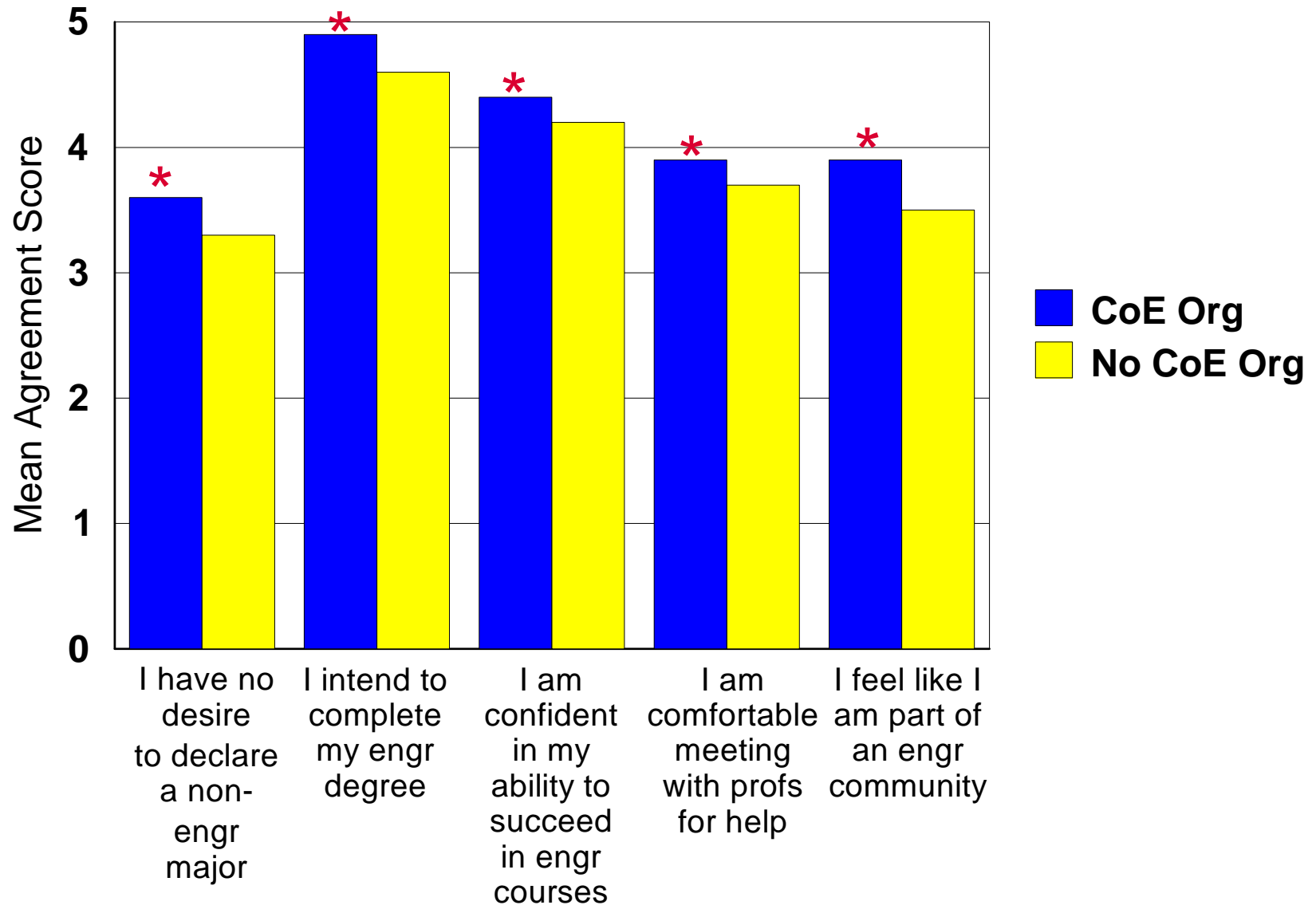


## Finding #1

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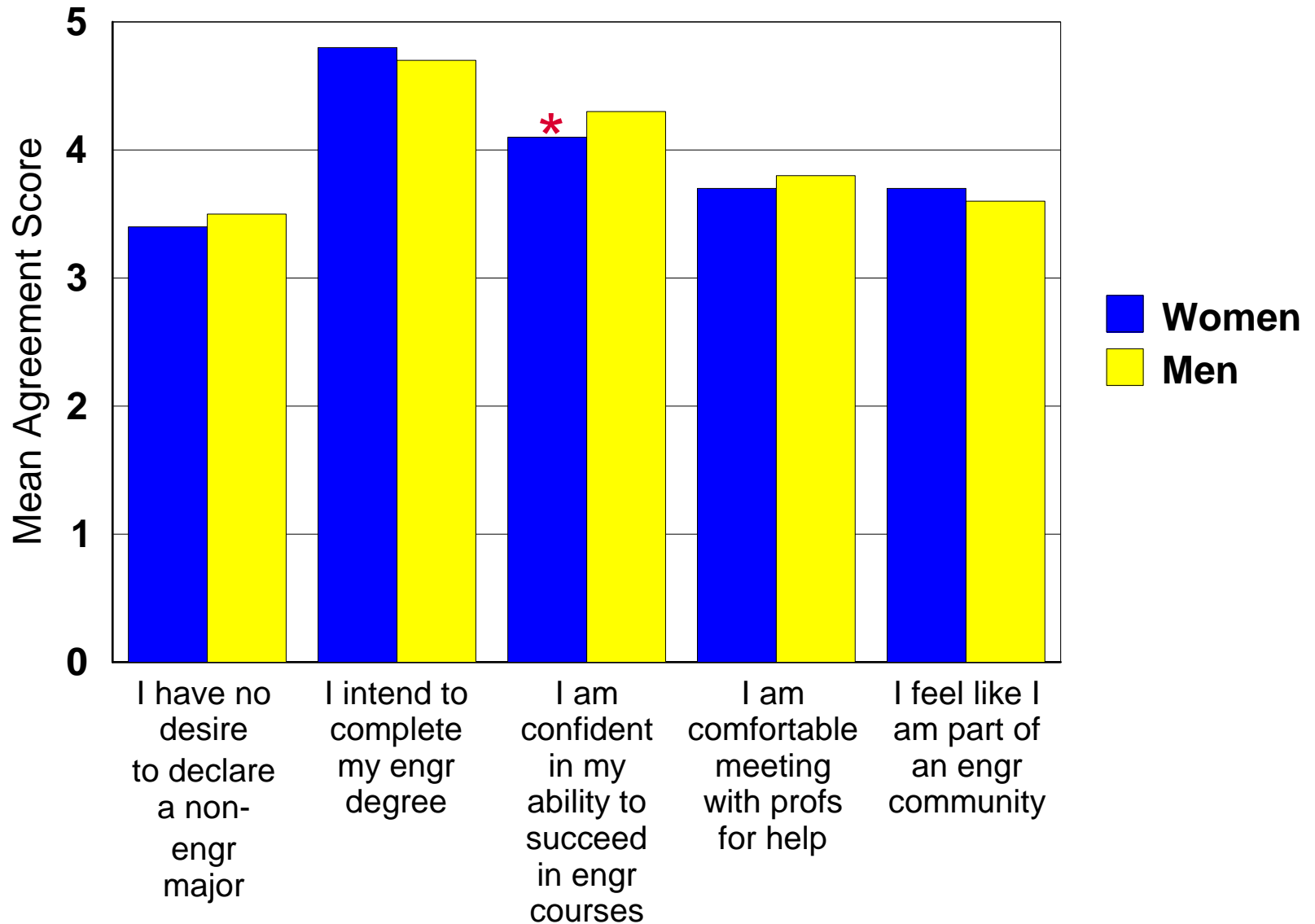
- Students participating in student organizations have consistently high satisfaction with their CoE experiences

# Satisfaction of CoE Student Organization Participants: Selected PACE Items



\* Significant difference  $p < .05$ .

# Satisfaction of Women Students in the CoE: Selected PACE Items



\* Significant difference  $p < .05$ .

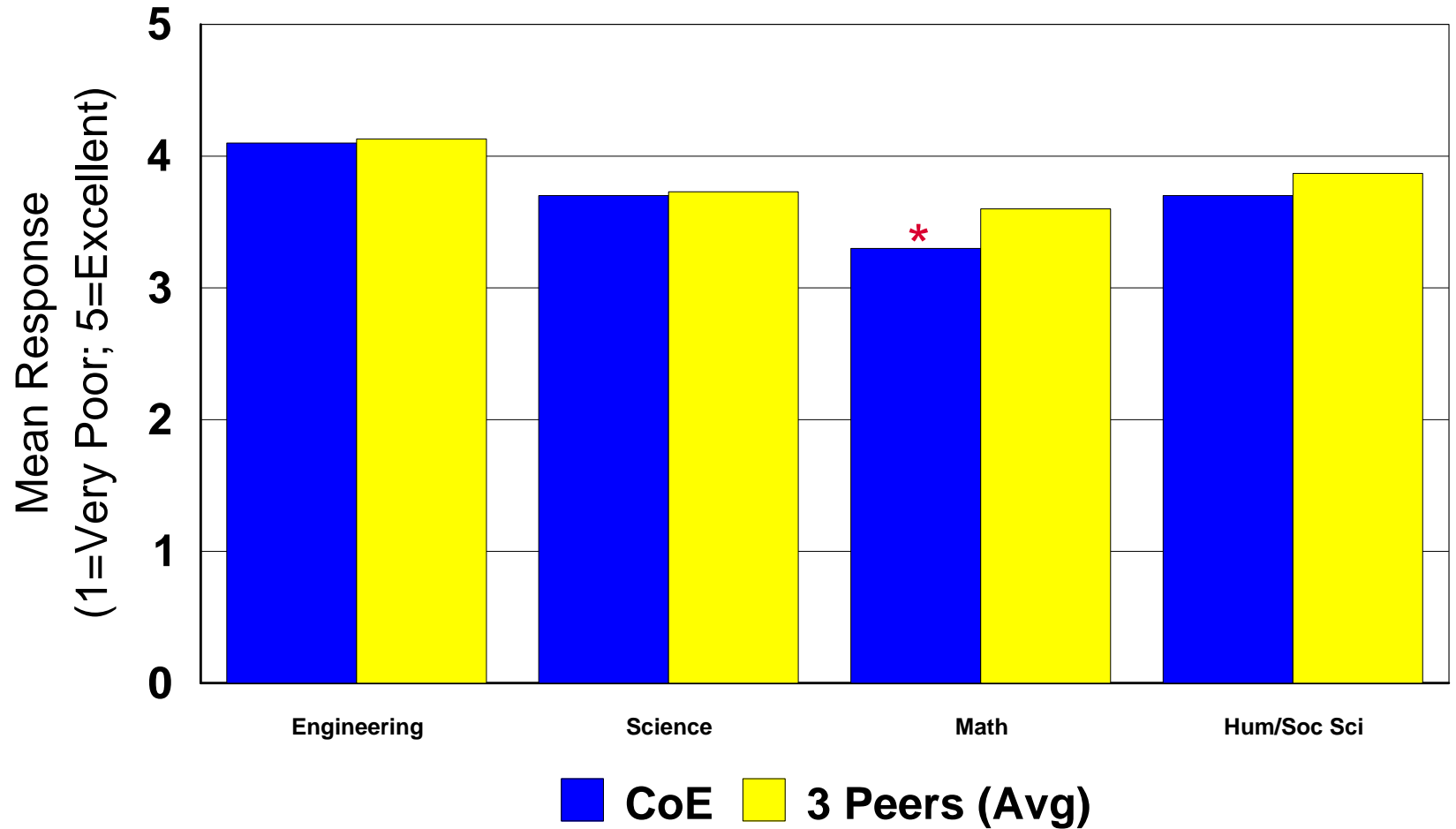


## Finding #2

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- Math courses are singled out as especially poor

# Quality of Teaching



\* CoE significantly different from Big-10 peers (see text)

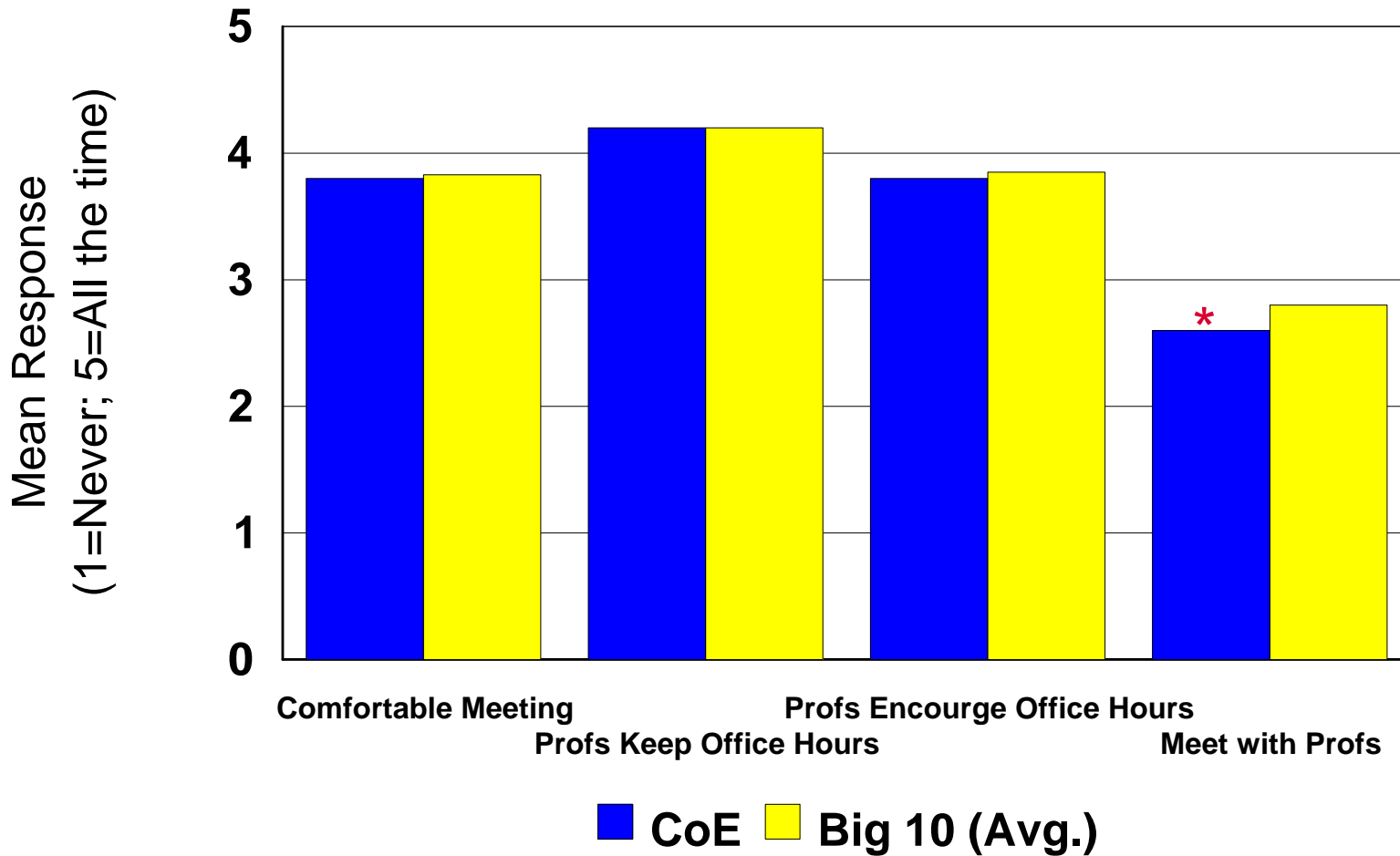


## Finding #3

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- A culture of not asking professors for help is evident in data

# Student Contact with Professors



\* CoE significantly different from Big-10 (see text)

*"Each professor is different but on  
The whole, IN class they want to  
Help and answer questions. Outside  
The lecture, I am less comfortable  
Asking them anything as they seem  
To be busy with research and won't  
Have time for me. If I do hae a question  
Outside of lecture, I will more than  
Likely go to my TA and only if my TA  
Suggests it will I go to my professor."  
(RID=351)*

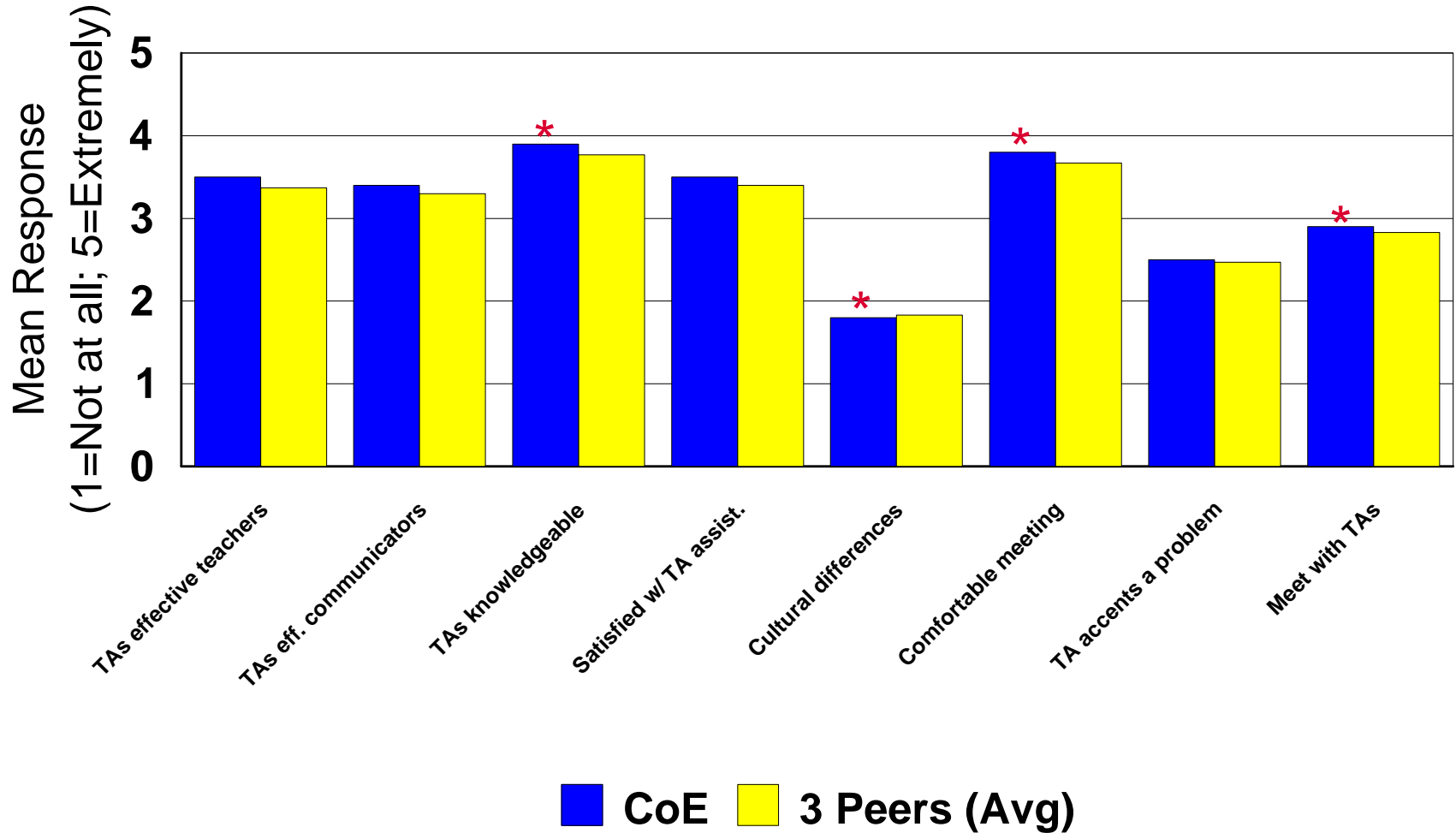


## Finding #4

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- TAs are given high marks by students

# Student Contact with TAs



\* CoE significantly different from Big-10 peers (see text)

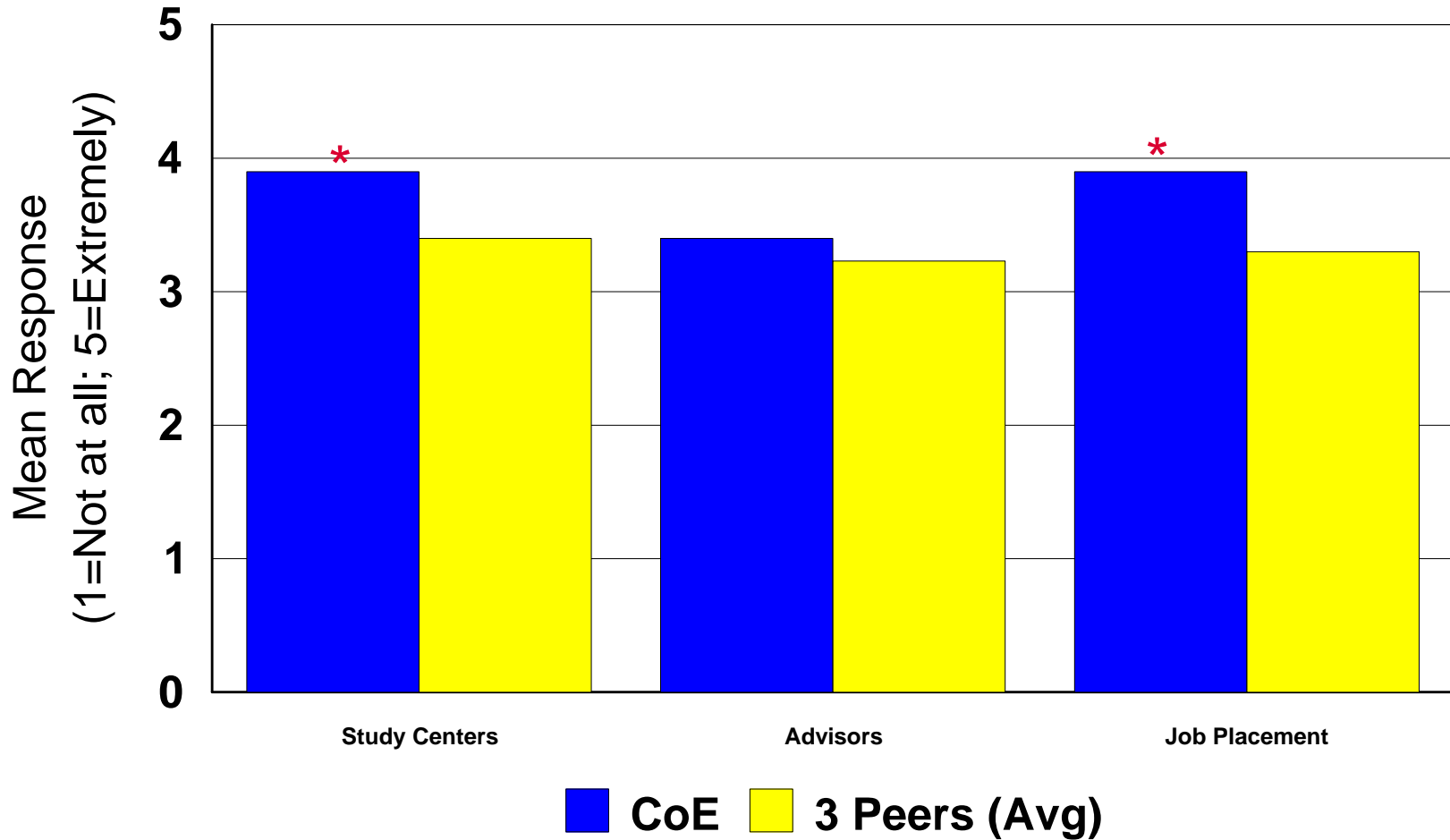


## Finding #5

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- CoE study centers and job placement help are very highly rated, relative to Big-10 peers

# CoE Resources



\* CoE significantly different from Big-10 peers (see text)

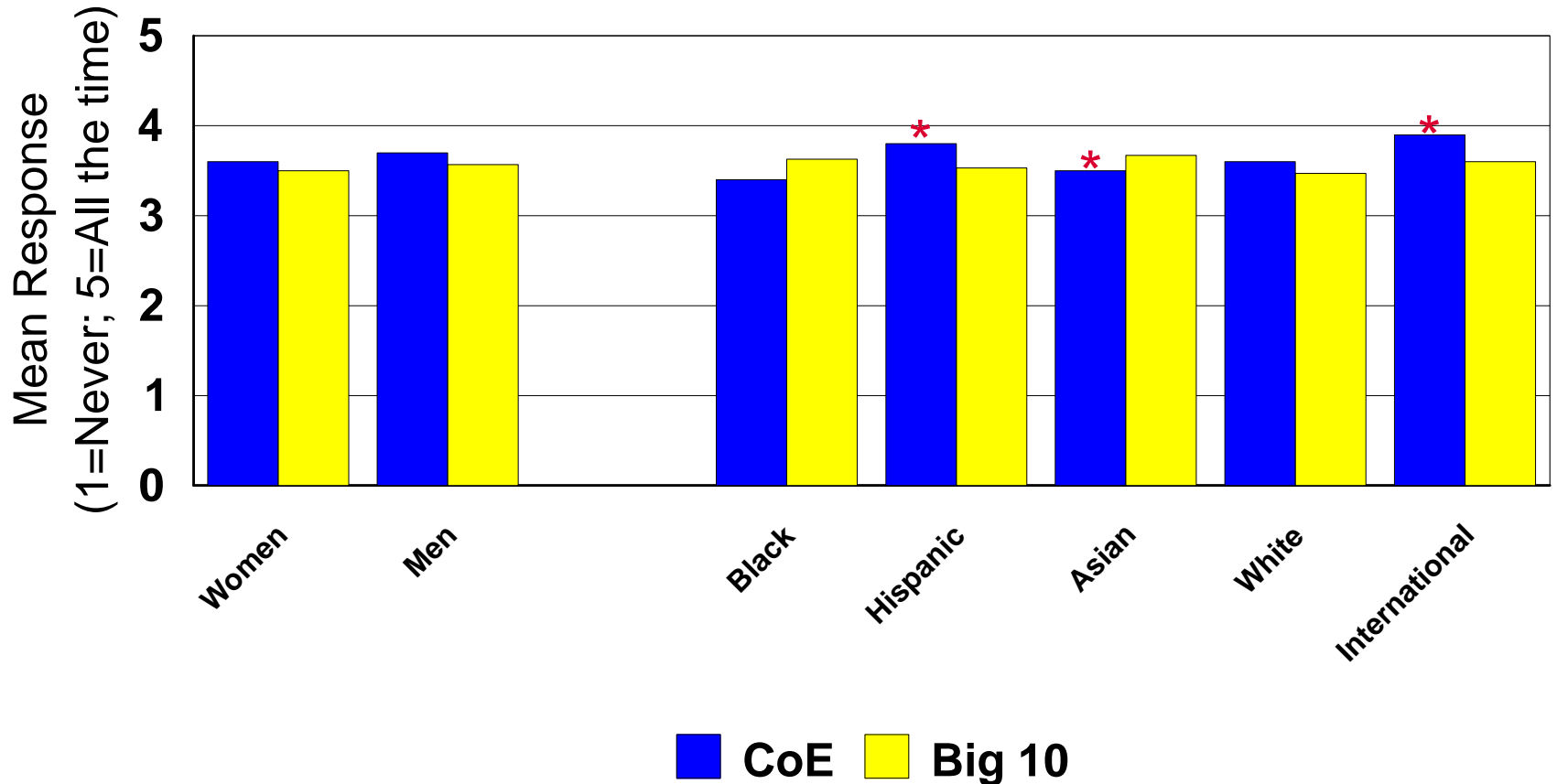


## (Non-)Finding #6

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- Women students in CoE do not feel marginalized in lab groups
  - Asian students do, however

# How often is lab work divided equally among lab group?



\* CoE significantly different from Big-10 peers (see text)

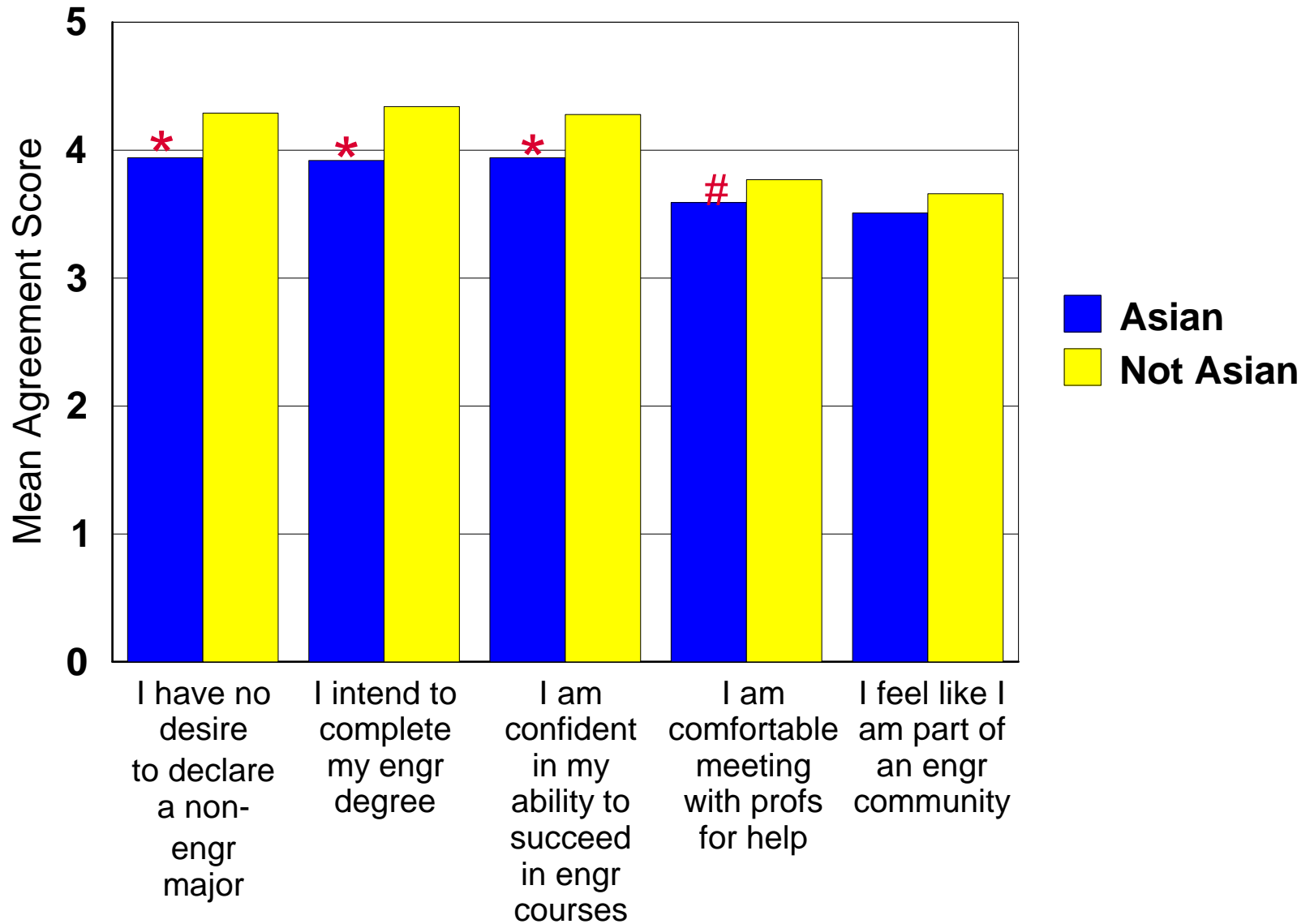


## Finding #7

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- Asian students (all ethnicities) have consistently lower satisfaction with their CoE experiences

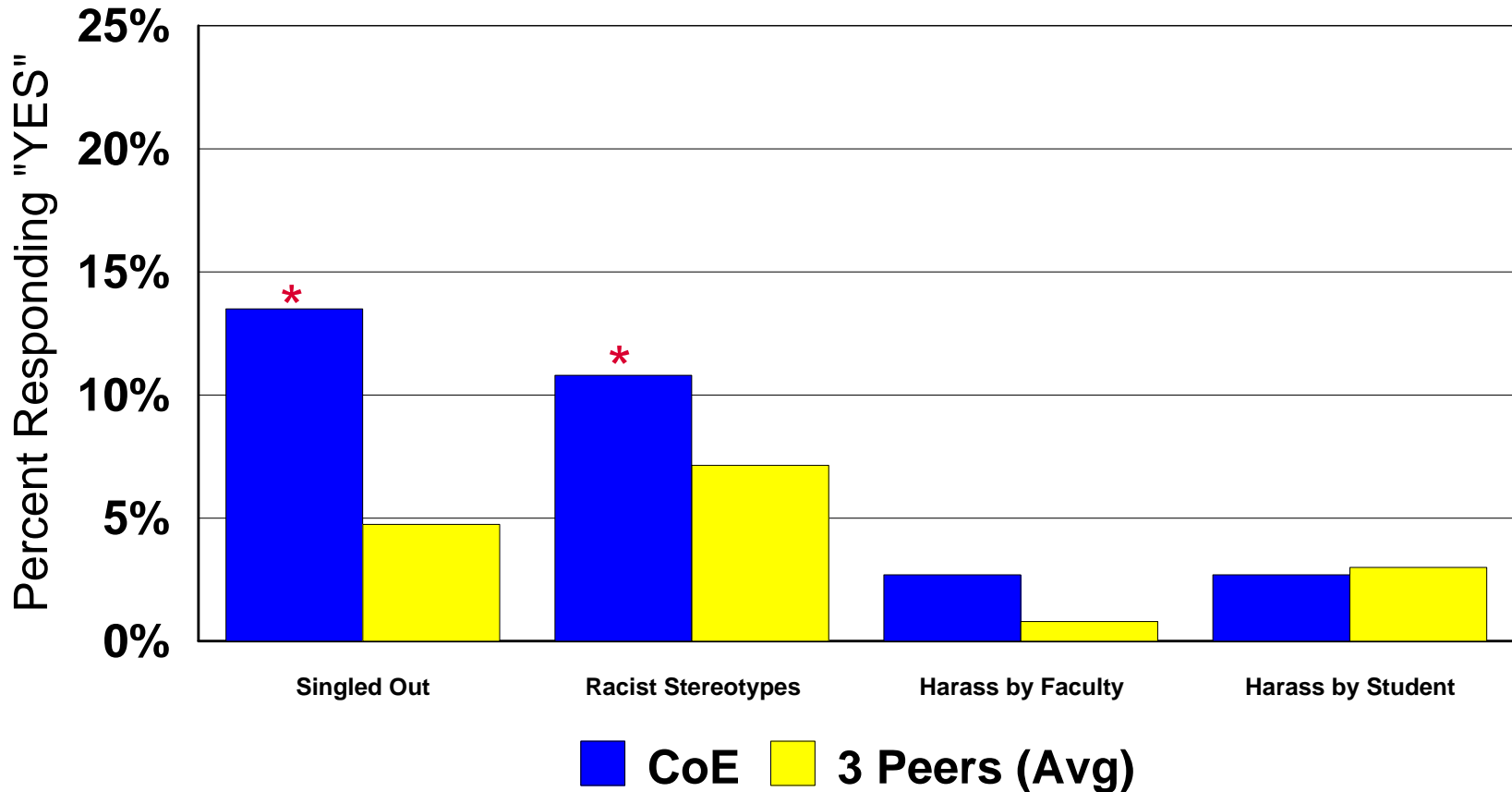
# Satisfaction of Asian Students in the CoE: Selected PACE Items



\* Significant difference  $p < .05$ ; # marginal significance  $p < .10$ .

# Singled Out Due To Race/Ethnicity

## Asian students only



\* CoE significantly different from Big-10 peers (see text)



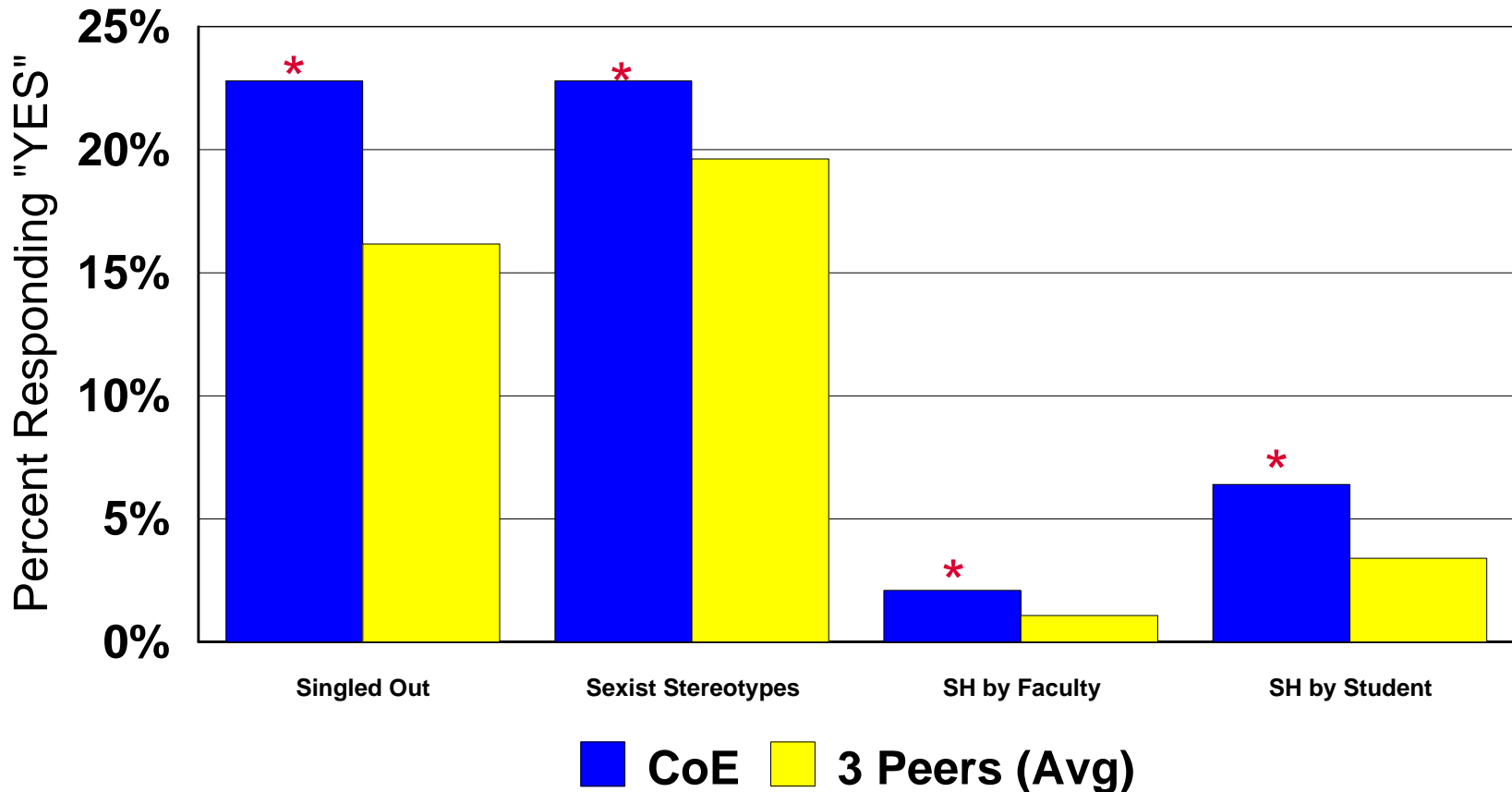
## Finding #8

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- Women CoE students report very high levels of experiencing differential treatment based on gender compared to women in Big-10 peer schools

# Singled Out Due To Gender

## Women respondents only



\* CoE significantly different from Big-10 peers (see text)

NOTE: SH=sexually harassed



## Finding #8:

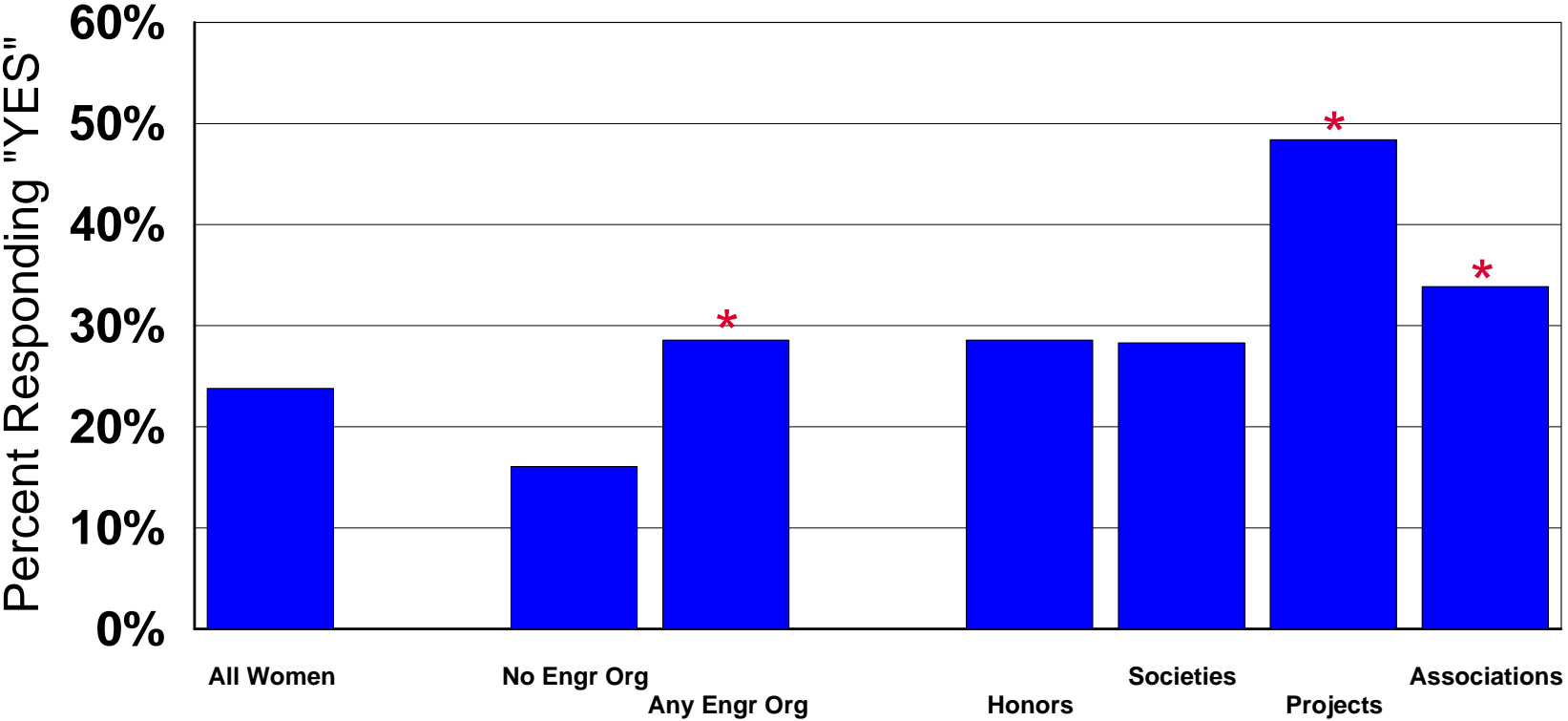
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- Even the men notice:

*“I think it’s very commonplace for Engineering students to joke about women, and how few of them there are in Engineering. The jokes seem harmless to us (men), but I’m sure their [sic] not to those few women actually in the field.”  
(RID=243)*

# Singled Out Unfairly Due To Gender

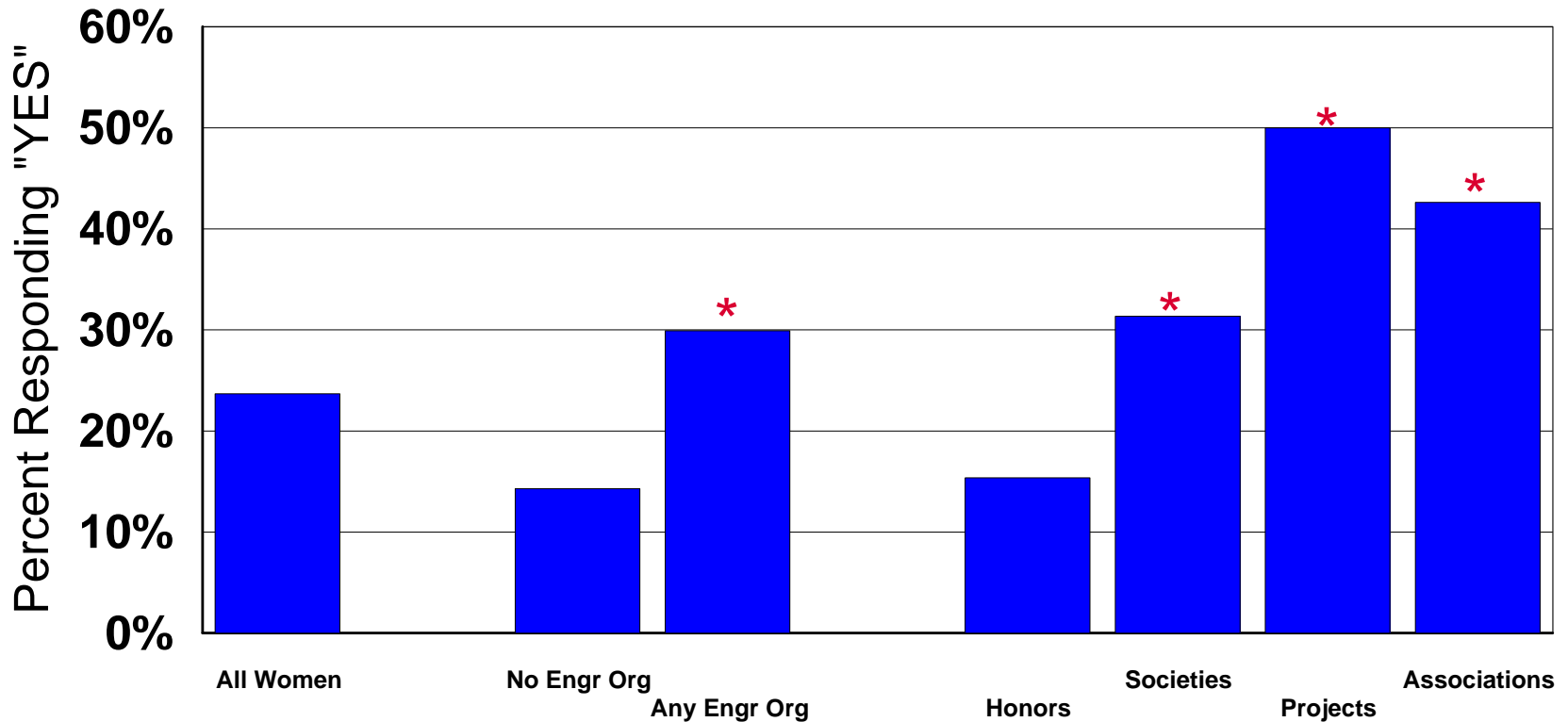
## Women respondents only



\* Significant difference  $p < .05$

# Faculty Express Stereotypes About Men and Women

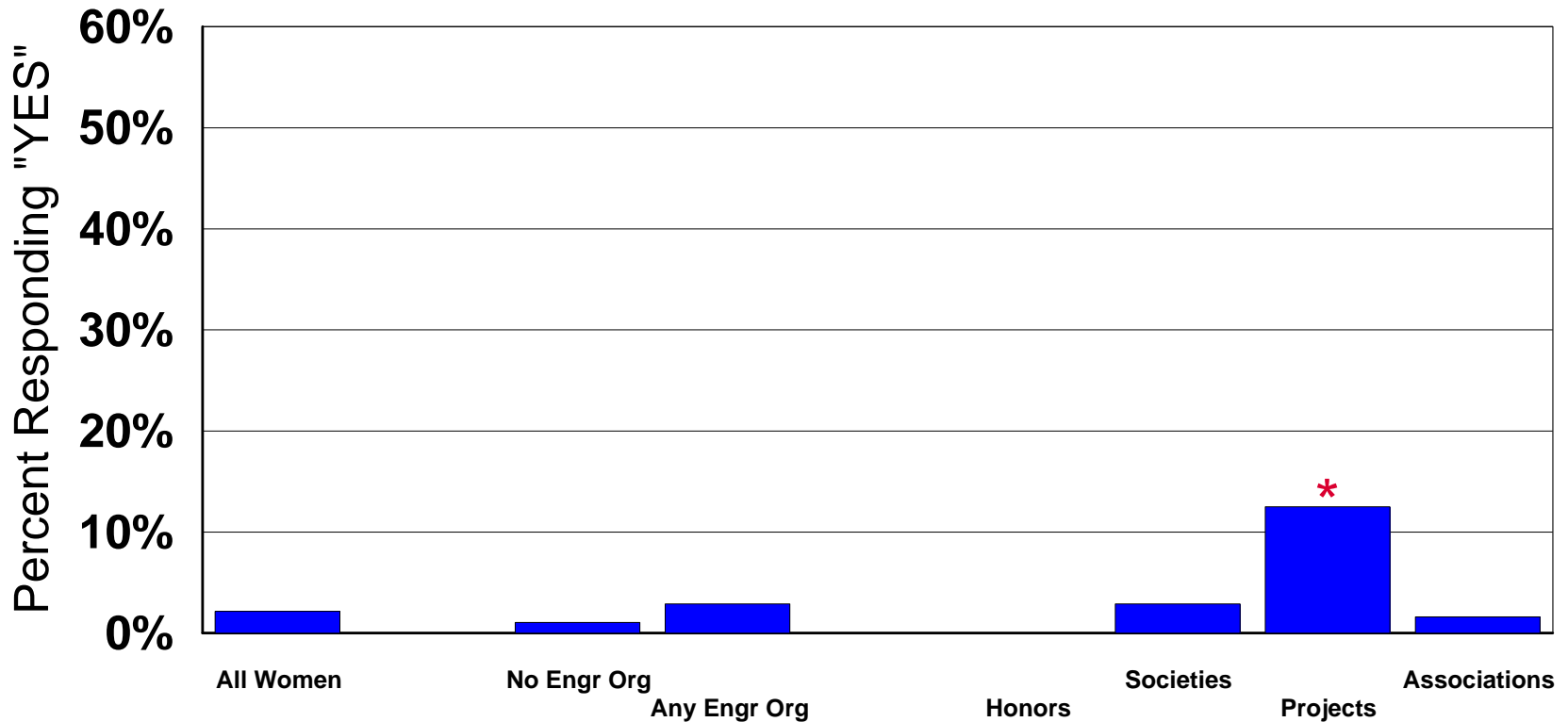
## Women respondents only



\* Significant difference  $p < .05$

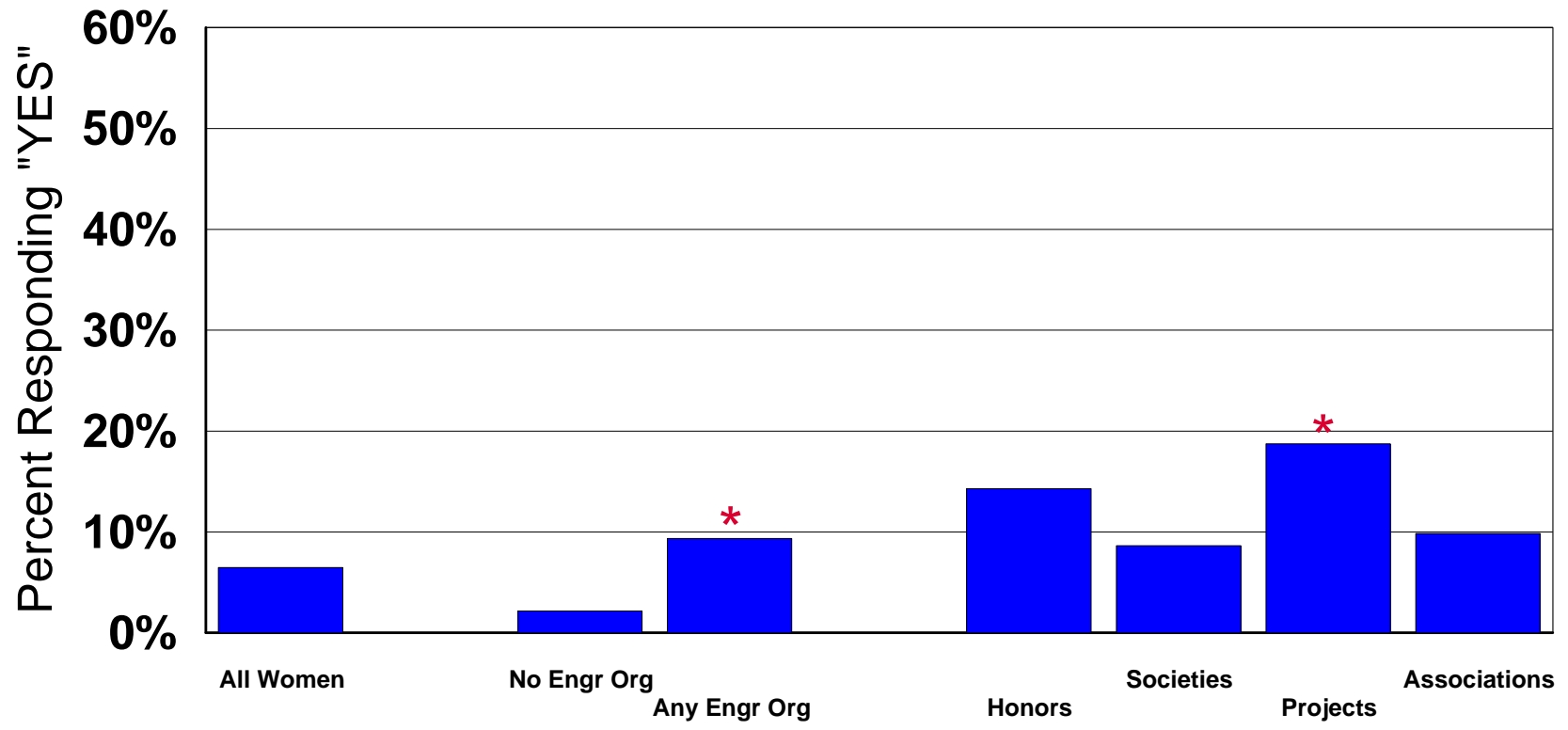
# Sexually Harassed by a Faculty Member

## Women respondents only



\* Significant difference  $p < .05$

# Sexually Harassed by a Student Women respondents only



\* Significant difference  $p < .05$

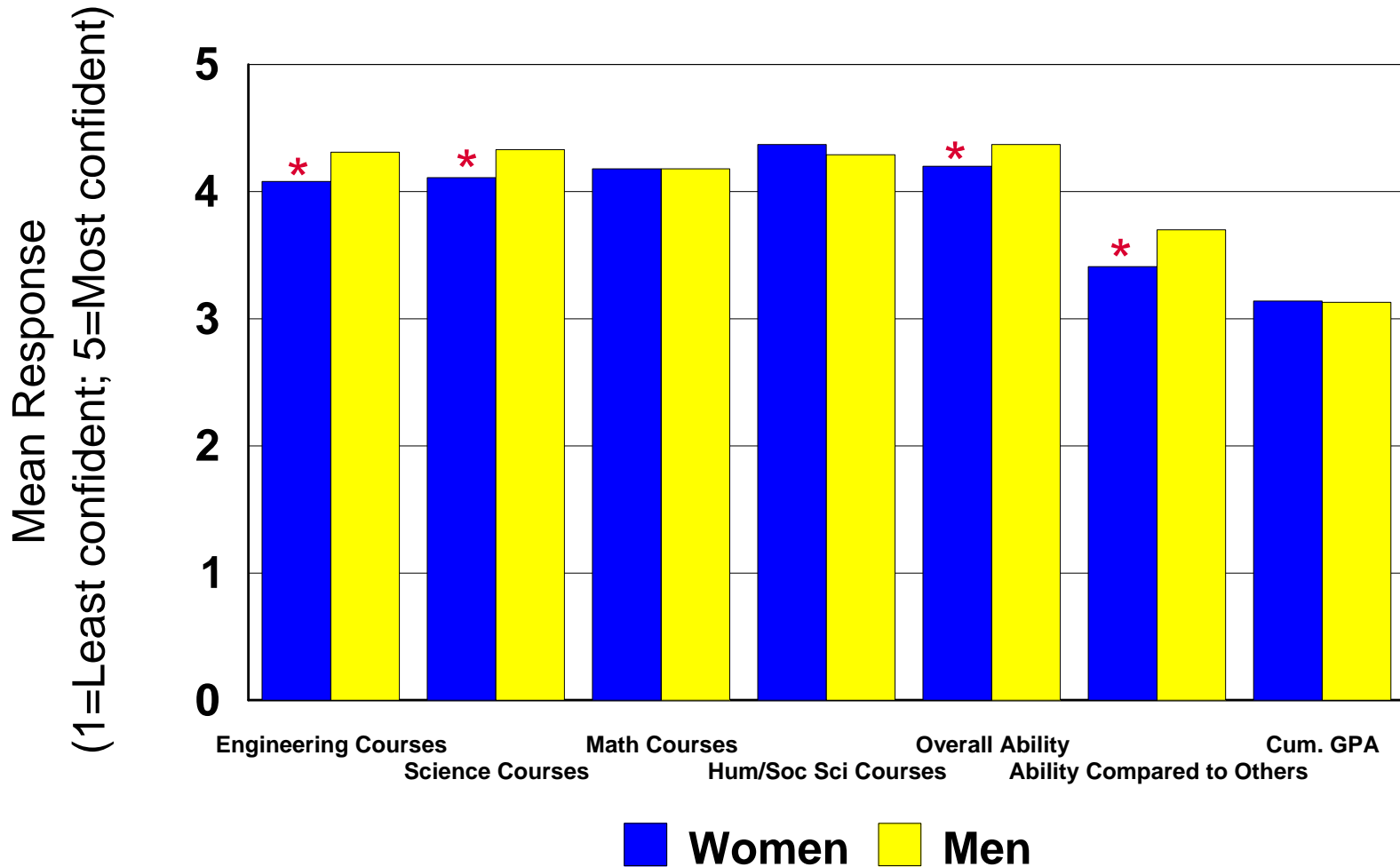


## Finding #9

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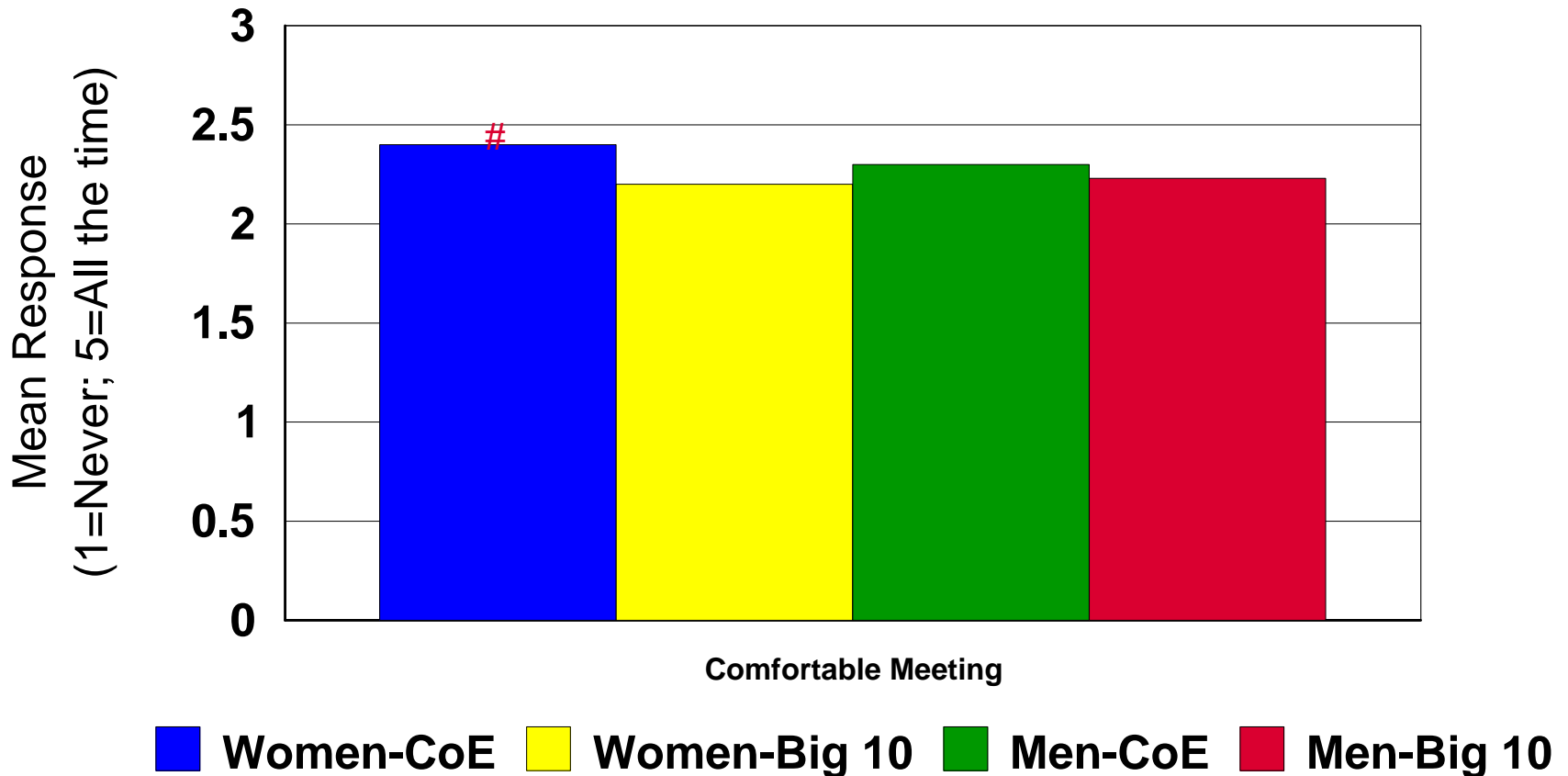
- Women CoE undergraduates have a “confidence gap”

# Confidence in Abilities



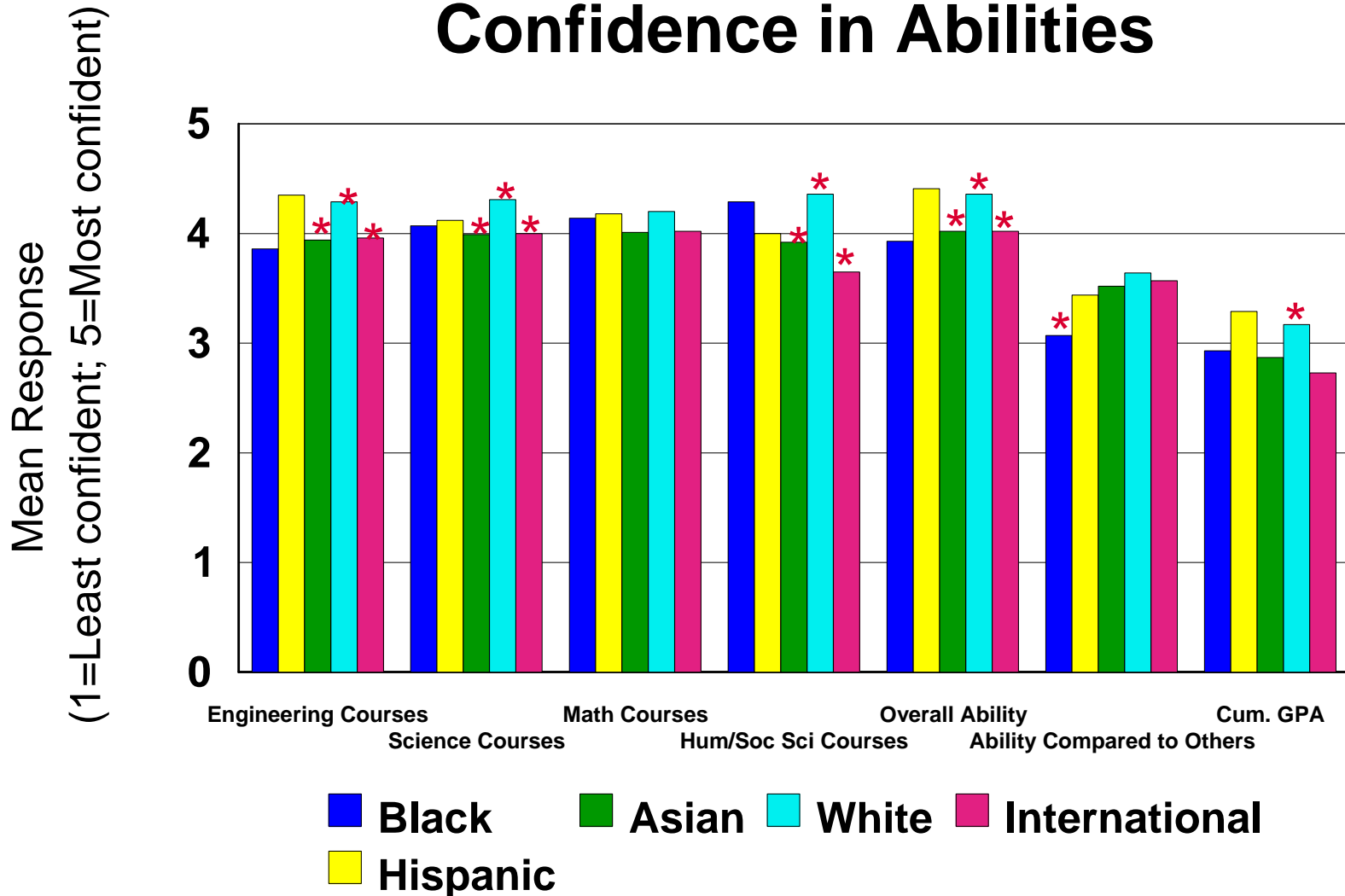
\* CoE women significantly different from CoE men ( $p < .05$ )

# Do your professors think you have a lower ability than you actually have?



# CoE women significantly different from Big-10 women (see text)

# Confidence in Abilities



\* Significant difference between selected group and all others ( $p < .05$ )

NOTE: See Appendix 1 for actual question wording and response categories.

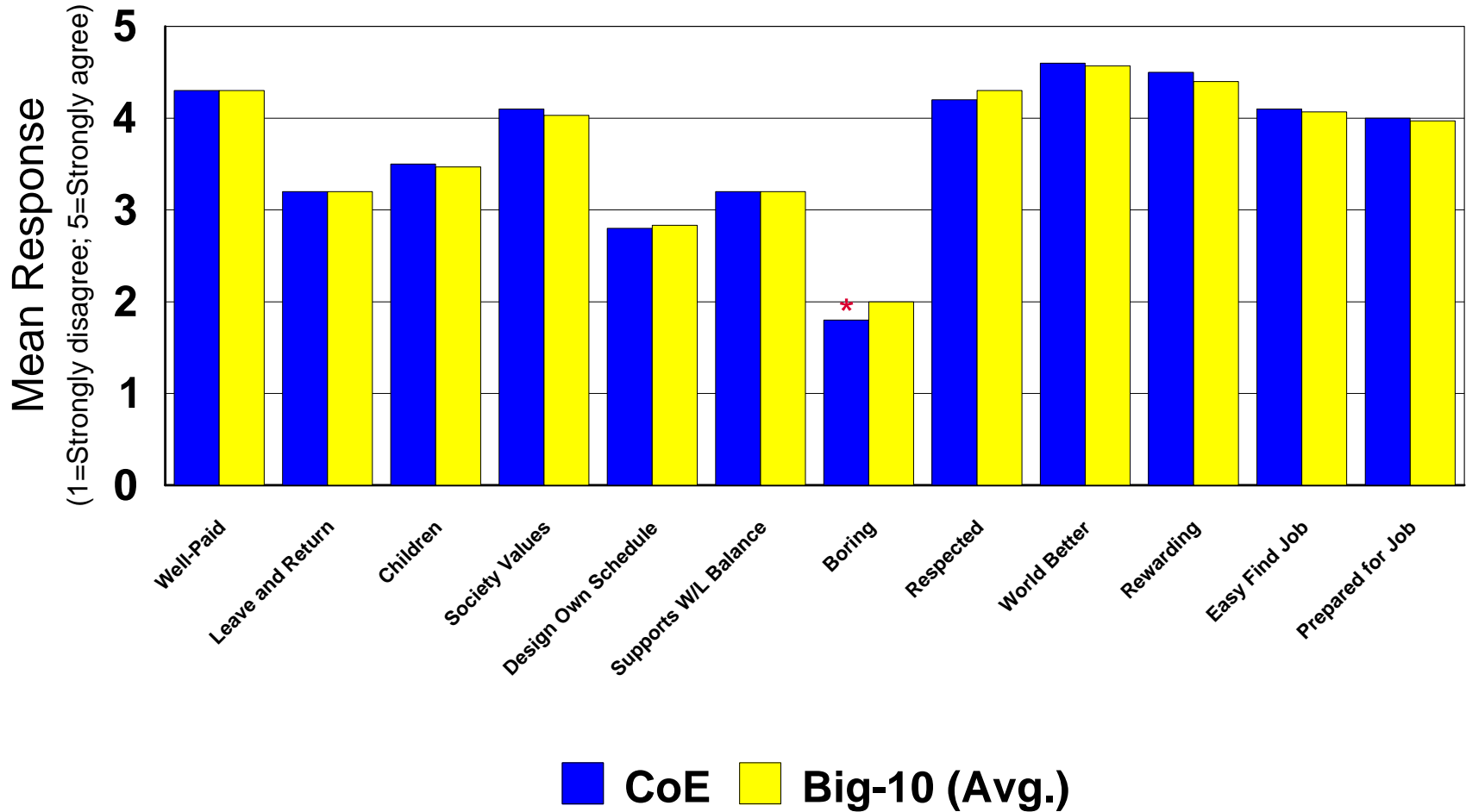


## Finding #10

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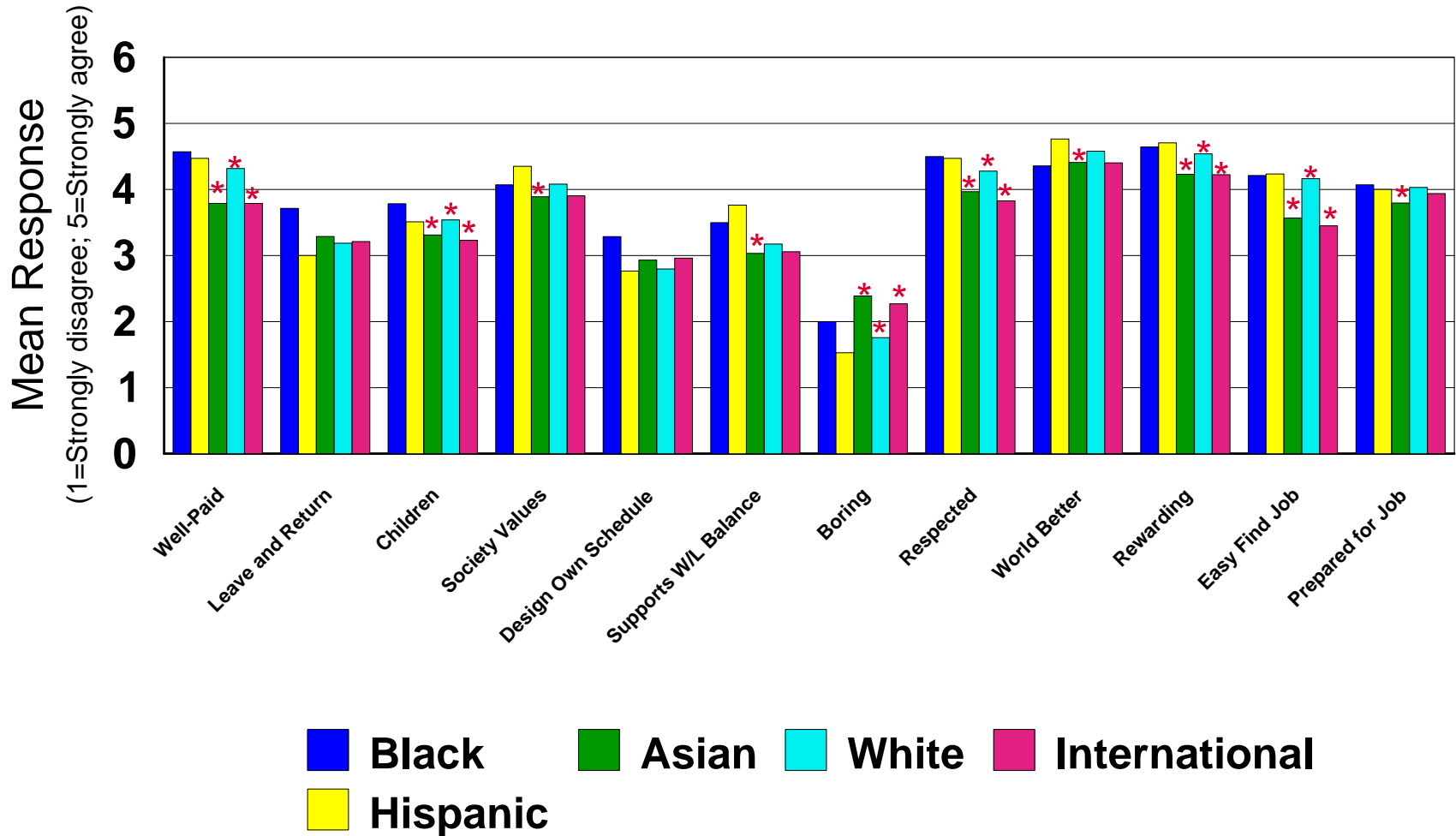
- UW-Madison Engineering students have a very positive view of Engineering as a discipline
- Very few gender differences, but many racial/ethnic differences

# Perceptions of Engineering



\* Significant difference between selected group and all others ( $p < .05$ )

# Perceptions of Engineering



\* Significant difference between selected group and all others ( $p < .05$ )



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