

An Analysis of Sex Differences in Computing Teaching Evaluations



**Priscila
Santiesteban**



Madeline Endres



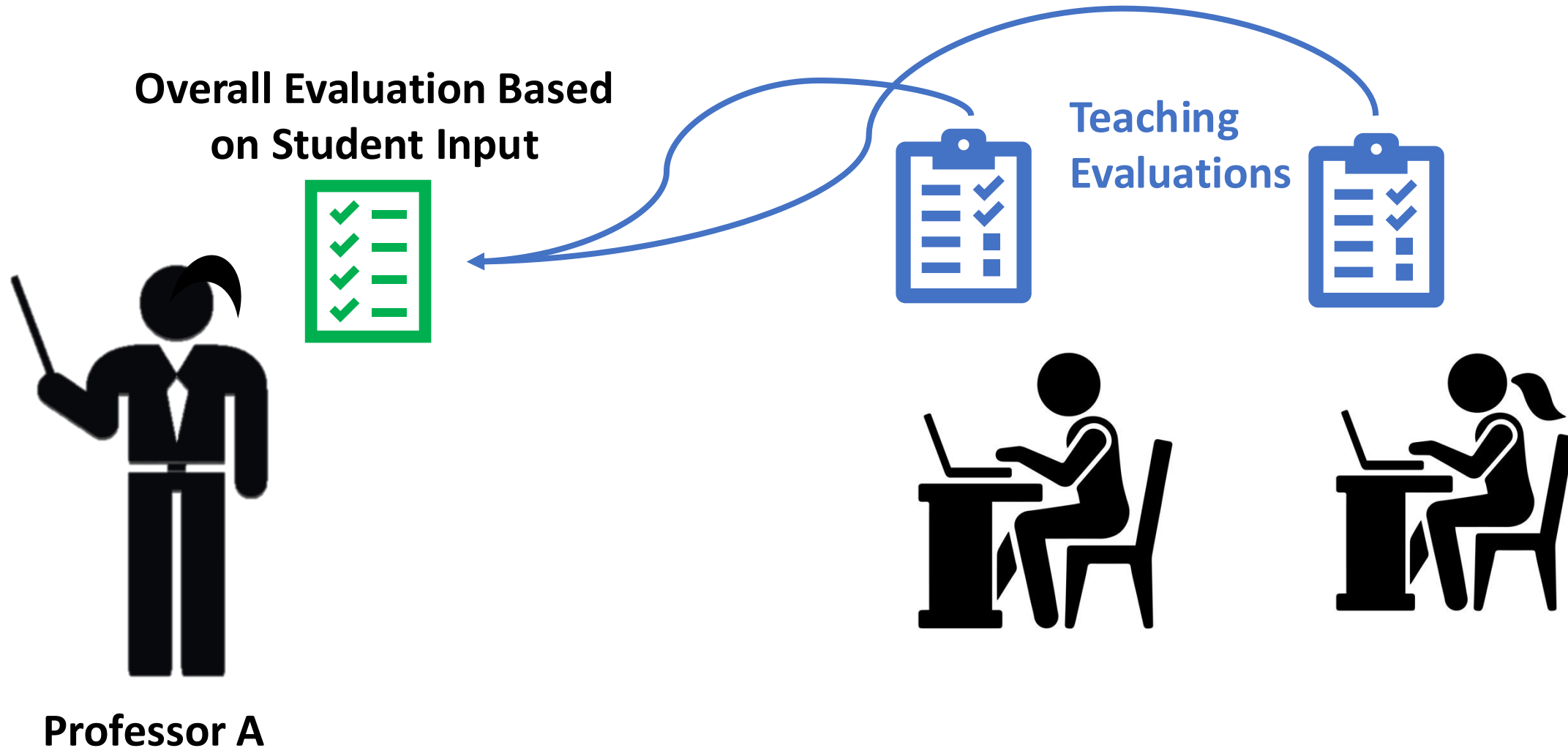
Westley Weimer

University of Michigan

May 20th, 2020



How Do We Evaluate Our Teachers: Student Teaching Evaluations

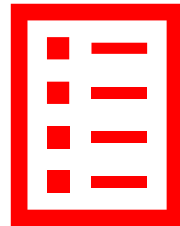


How Do Evaluations Affect Professors?

Individual Evaluation Scores



Professor A



Professor B

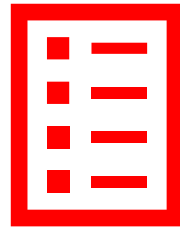
- Institutions will Use these to help determine promotions
- Future students may use these for class registration decisions

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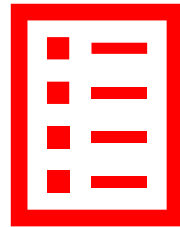
Should they
be used for
tenure
evaluations?

How Do Evaluations Effect Professors?

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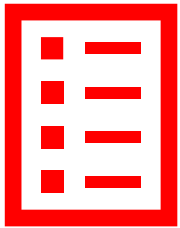
Should Expect:

Higher Scores -> Higher Quality Teaching

Lower Scores -> Lower Quality Teaching

Problem: Sex Bias Exist in Student Evaluations of Teachers

Individual Evaluation Scores



Professor A



Professor B

Reality:

Evaluation Scores
Favor Male over Female

- Impact promotions for women
- Encourage stereotypes
- Impact representation of women figures in the field

Problem: Sex Bias Exist in Student Evaluations of Teachers

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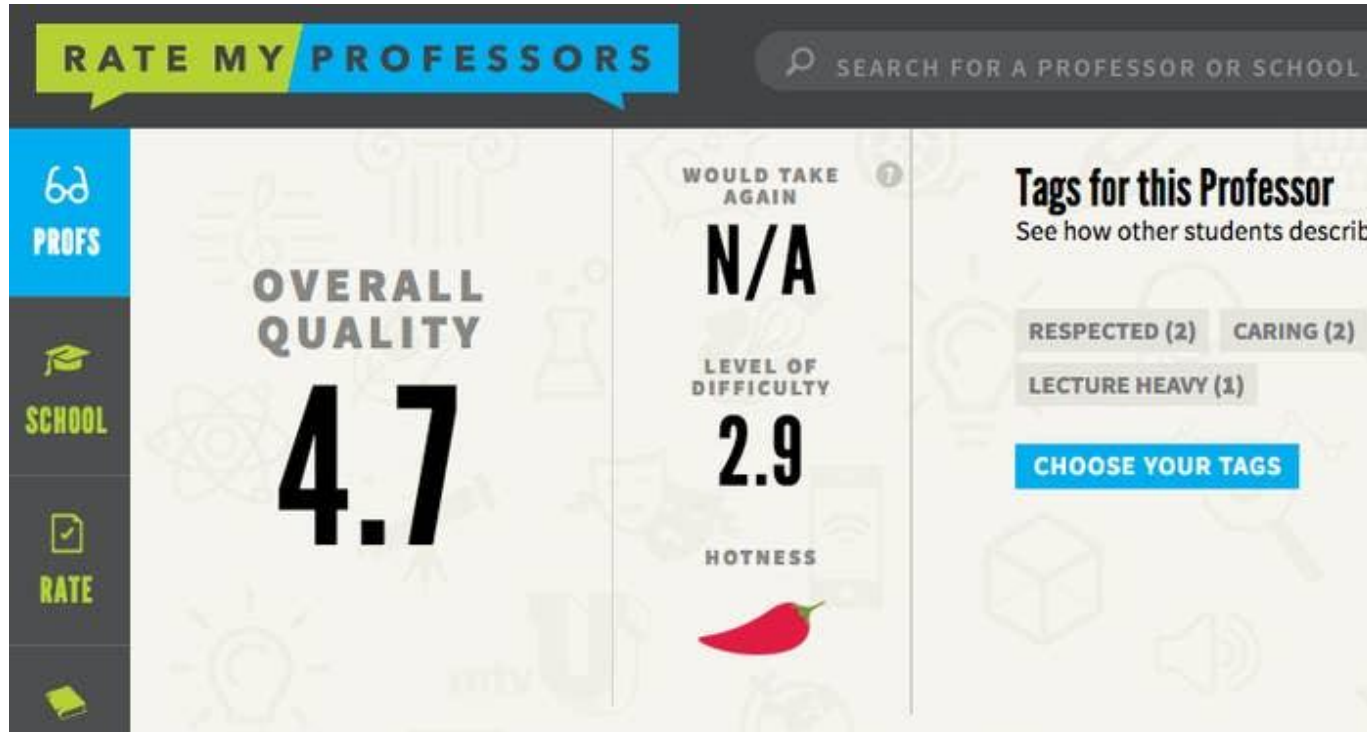
Professor A



Professor B

**How "Bad" Is The Sex Bias for
Evaluations in Specific
Divisions?**

RateMyProfessor (CS) Ratings

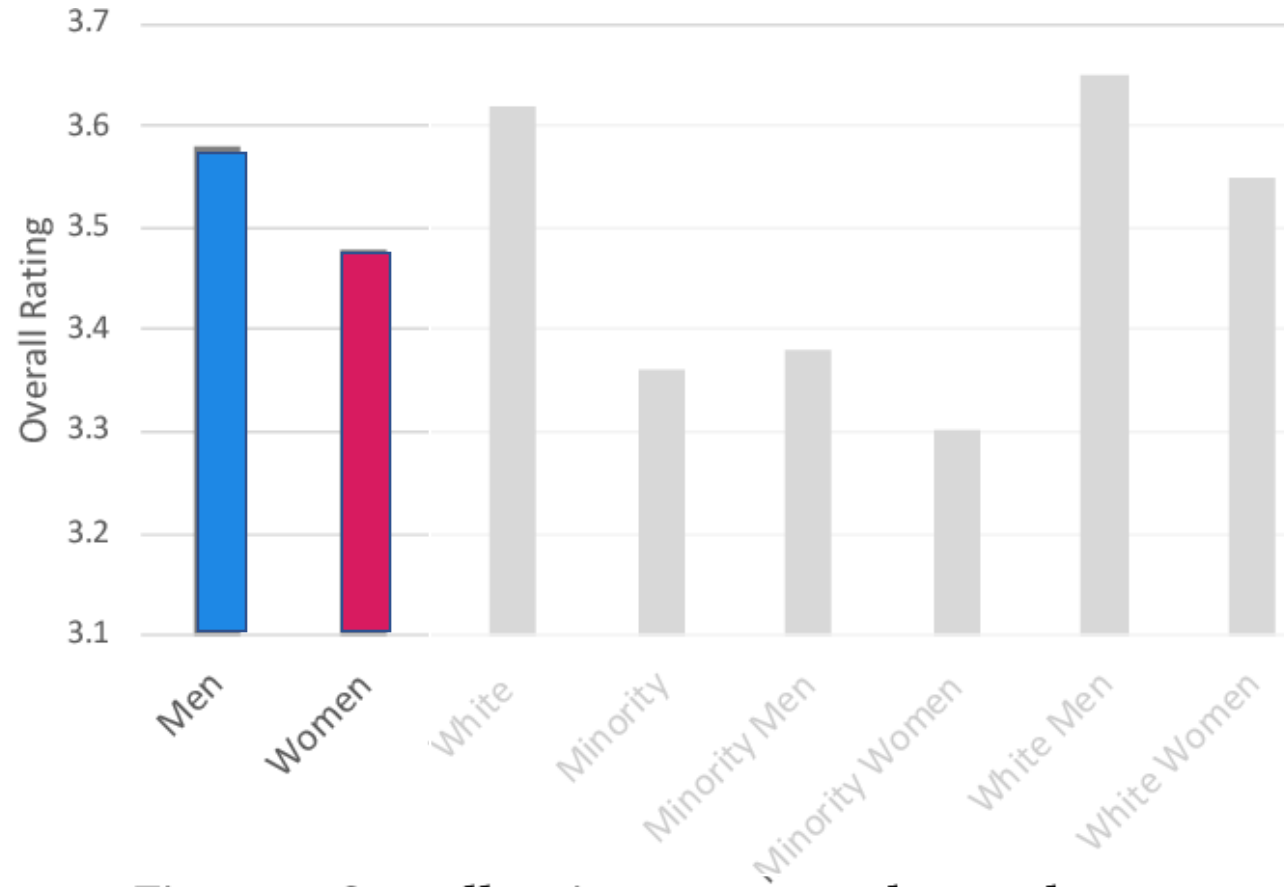


RateMyProfessor – online public forum for students

Students rate professors from their school and other factors



Gender Bias in Computer Science (CS) Ratings



Study Looking at *RateMyProfessor* Ratings, indicated that:

“Women are Rated Lower Than Men in Overall Teaching Quality”

Figure 1: Overall rating across genders and races



Gender Bias in Computer Science (CS) Ratings

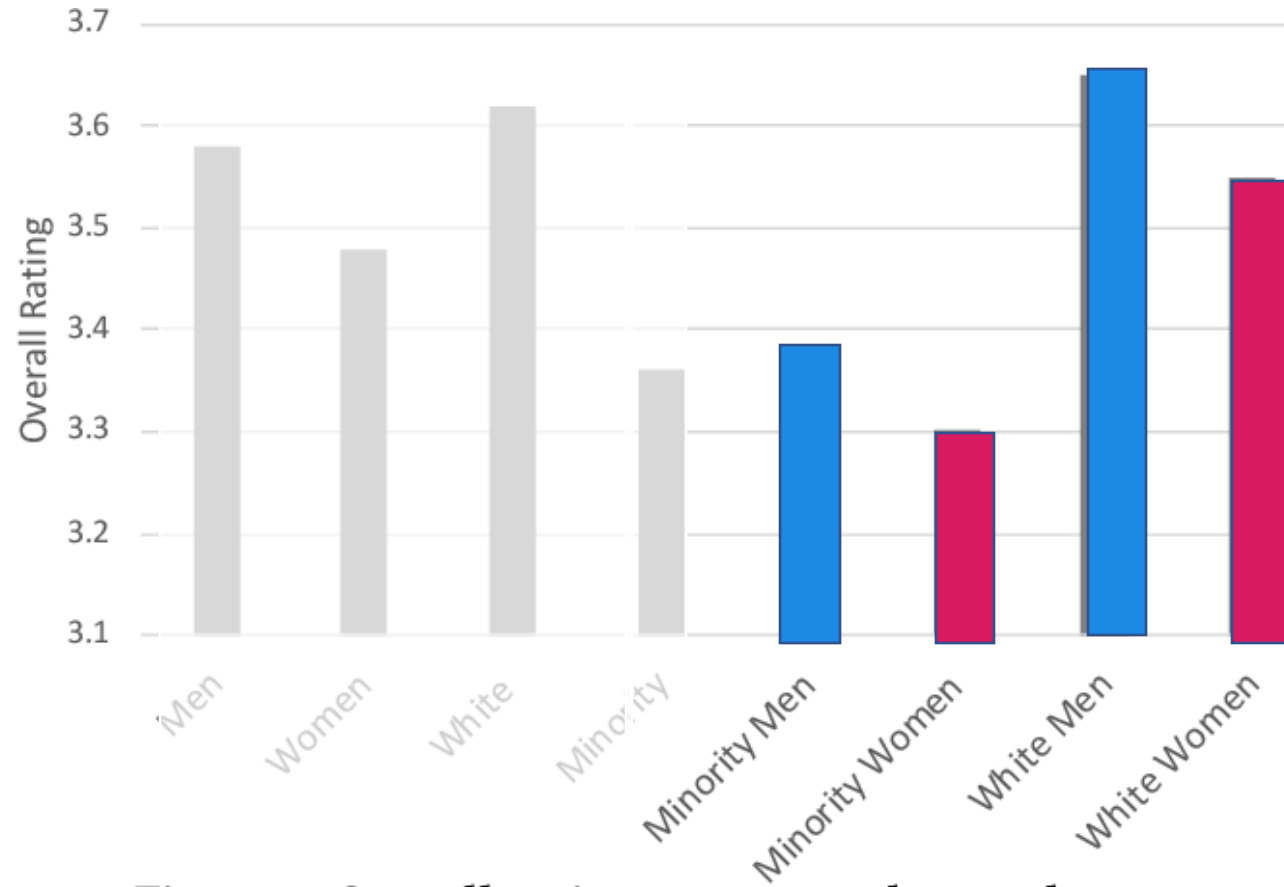


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“Minority and White Women are Rated Lower than their Minority and White male counterpart.”



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**Is there bias in student
evaluations handled at
the institutional level?**

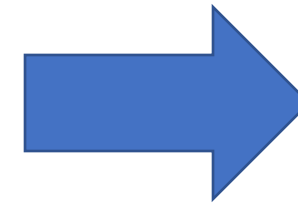
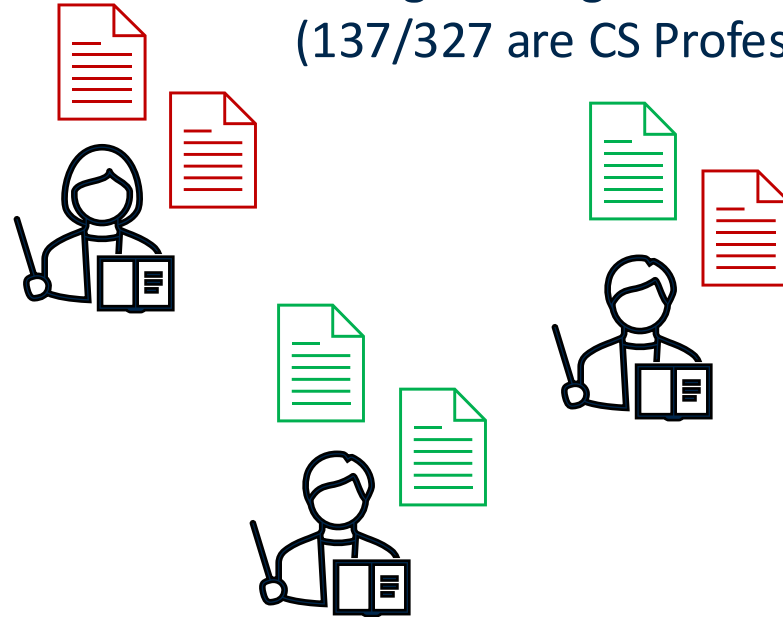
Figure 1: Overall rating across genders and races



Goal: Further Examine the Magnitude of Sex-Biases in CS Student Teacher Evaluations



Number of Engineering Professors = 327
(137/327 are CS Professors)



*Is there
Sex Bias?*

University of Michigan
Computer Science and
Engineering Division
(CSE)

Collect Student
Teacher Evaluations
of Michigan CSE
Professors

Evaluate Student
Teacher Evaluations
for Bias

Limits to Student Teaching Evaluations Data at Michigan

All Engineering Instructors	Professors	Non-Professors	All
Female	47	37	84
Male	137	103	240
Total	184	140	327

327 of 800 Professor Evaluations Selected:

Analysis restricted to those courses in the top quartile of enrollment (> 40 students)

CS Instructors	Professors	Non-Professors	All
Female	11	22	33
Male	48	56	104
Total	59	78	137

***Data available from Michigan only report sex -> Proxy for Gender Bias**



Research Questions

- 1) Is the sex of computer science instructors correlated with average teaching evaluation scores?
- 2) Do sex-based differences present differently for professors vs. student instructors?
- 3) How do sex differences observed with computing instructors compare to those observed with non-computing engineering instructors?

Research Questions : Focus on RQ1 & RQ2

- 1) **Is the sex of computer science instructors correlated with average teaching evaluation scores?**
- 2) Do sex-based differences present differently for professors vs. student instructors?
- 3) How do sex differences observed with computing instructors **compare to those observed with non-computing engineering instructors?**

RQ1 : Is the sex of computer science instructors correlated with average teaching evaluation scores?



YES,

Sex of CS instructors **correlates with** their average **teaching evaluation scores**

Question	Professors		
	F	M	<i>p</i> -value
Overall, this was an excellent course	3.80	4.25	<0.01
Overall, the instructor was an excellent teacher	4.07	4.40	0.04
The instructor explained material clearly	4.04	4.39	0.03
The instructor treated students with respect	4.65	4.69	0.65
The instructor seemed well prepared for class meetings	4.47	4.50	0.40
This course advanced my understanding of the subject matter	4.23	4.53	<0.01
My interest in the subject has increased because of this course	3.84	4.27	<0.01
I knew what was expected of me in this course	4.03	4.28	0.05
Aggregate Evaluation	4.19	4.46	0.02

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RQ3 : How do CS Sex Bias Compare to Sex Bias with non-computing engineering instructors?



**Found No Significant Sex
Bias in Non-CS
Engineering Instructors**

Research Questions

- 1) Is the sex of computer science instructors correlated with average teaching evaluation scores?
- 2) Do sex-based differences present differently for **professors vs. student instructors**?
- 3) How do sex differences observed with computing instructors compare to those observed with non-computing engineering instructors?

RQ2 : Do sex-based differences present differently for professors vs. student instructors?



NO,

Sex-related differences in teaching evaluation scores for non-professor student instructors are not significantly different

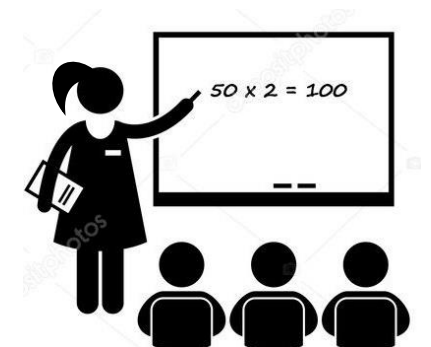
Question	Professors			Non-Professors		
	F	M	p-value	Female	Male	p-value
Overall, this was an excellent course	3.80	4.25	<0.01	3.99	4.13	0.35
Overall, the instructor was an excellent teacher	4.07	4.40	0.04	4.35	4.36	0.91
The instructor explained material clearly	4.04	4.39	0.03	4.42	4.39	0.79
The instructor treated students with respect	4.65	4.69	0.65	4.60	4.63	0.40
The instructor seemed well prepared for class meetings	4.47	4.50	0.40	4.46	4.43	0.74
This course advanced my understanding of the subject matter	4.23	4.53	<0.01	4.28	4.40	0.18
My interest in the subject has increased because of this course	3.84	4.27	<0.01	3.96	4.10	0.35
I knew what was expected of me in this course	4.03	4.28	0.05	4.16	4.18	0.84
Aggregate Evaluation	4.19	4.46	0.02	4.27	4.35	0.44

RQ2 Results: Why are Sex-Related Differences in Teaching Evaluations for Non-Professors not Significant?



No significant difference in evaluations for non-professors may be due to:

1. Perceived *authority* of the instructor
2. A *discrepancy in our methodology*, as we focus on classes with enrollment of over 40 students
3. *Female student instructors outperform* their male counterparts



Implication: Sex-Differences in Professors Affect Their Female Teaching Evaluations by 6%



- We found **additional evidence that sex-biases exist** in computer science student teacher evaluations
- Surprisingly, these **differences are driven by professors** rather than student instructors
- We don't observe significant sex-related differences for student instructors
- Finally, we observe that **the magnitude of sex-biases in teaching evaluations is specific to computer science**



Priscila Santiesteban
pasanti@umich.edu

**An Analysis of Sex Differences in
Computing Teaching Evaluations**



Bonus Slides Next:



Discussion Questions:

1. Given the likelihood of teaching evaluations being influenced by gender bias (and other biases), should they still be used by the institution?
If so, what measures should institutions take when considering the results of these evaluations in a teacher's case?
2. Who is responsible for the biases in these teaching evaluations? Is it the responsibility of the department, the institution, or is this an ingrained cultural issue? If it's ingrained, does that mean we have no control?
3. How important do you think it is to improve the biases in teaching evaluations? Should they be prioritized?



Bias in Computer Science (CS) Teaching Evaluations

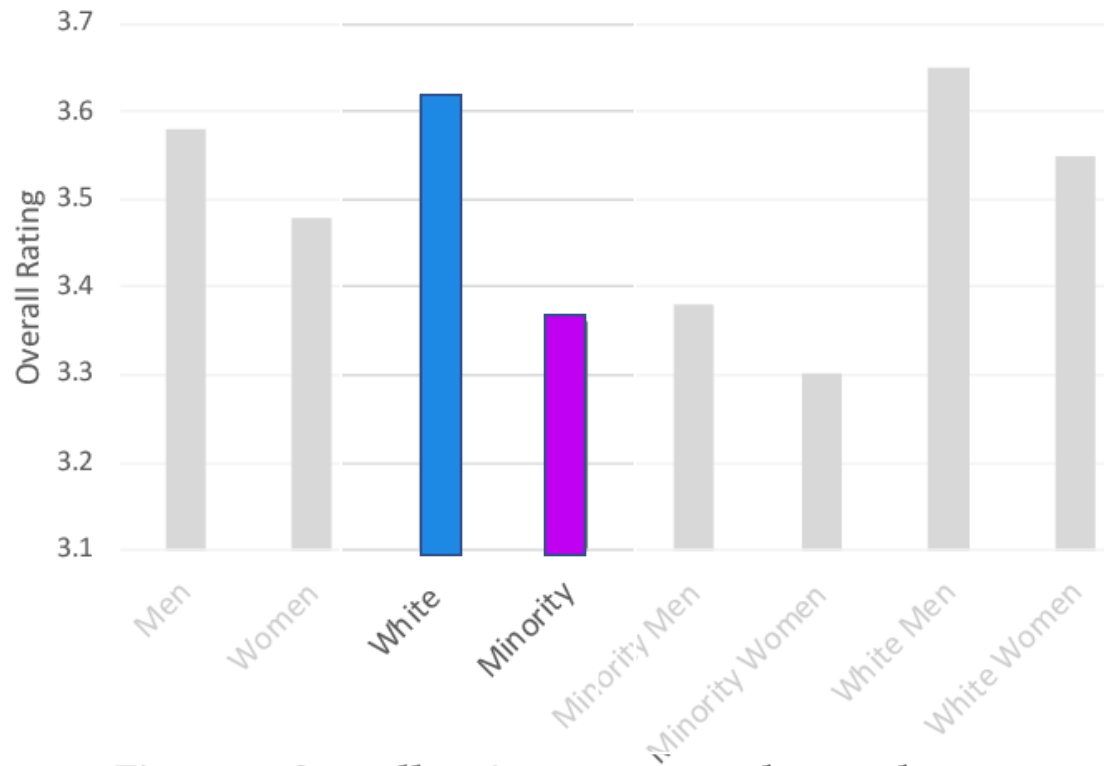


Figure 1: Overall rating across genders and races

Study Looking at *RateMyProfessor* Ratings, indicated that:

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“Minority and White women are rated lower than their Minority and White male counterpart.”

“Minorities, in general, are rated lower than their white counterparts regardless of sex”