

# **Gender Differences in Class Participation in Core Computer Science Classes**

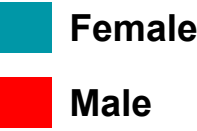
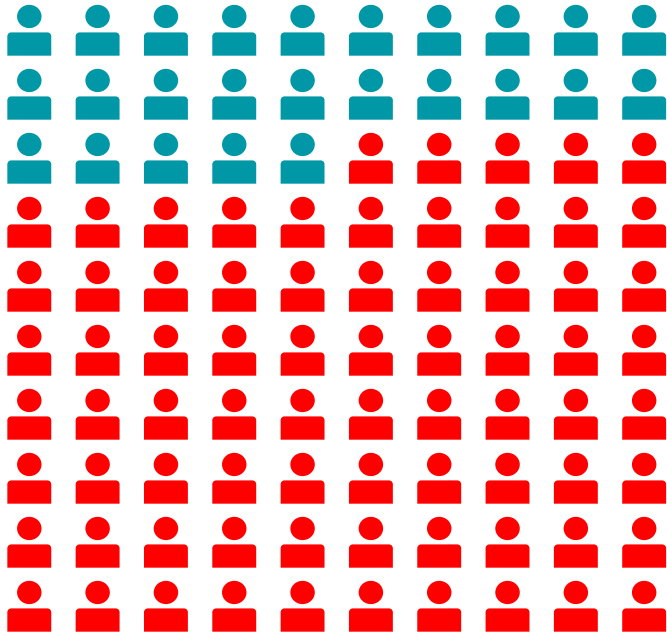
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# Motivation

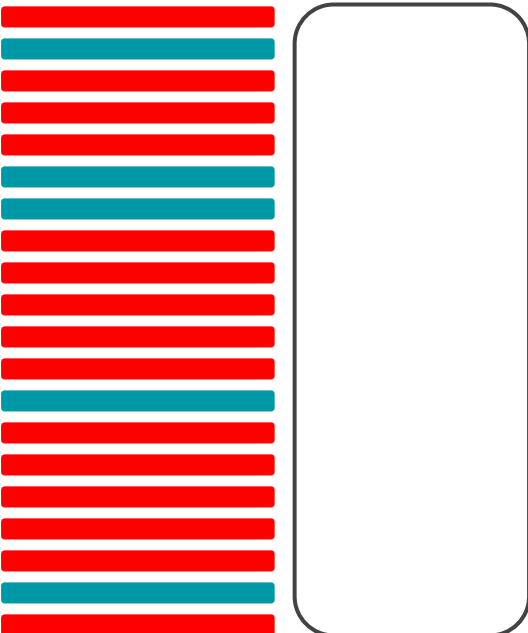
Now, I wouldn't be a good instructor if I didn't try to push you further, especially because I think you have the skills. So I would like to mention that **the only reason you're not ranked 1st in the class is because the top of the class was one of the most active students on Piazza and ended up getting more extra credit than you did for participation.** The reason that I'm bringing this up is that for some reason, this quarter more than others, it struck me that Piazza was so male dominant and I'd like to gather some insight about this.

I extracted some stats out of curiosity, and I found some interesting observations. **When female students participate, they often avoid writing their answers inside the "answer" box, and prefer the followup discussions down below.** According to the stats, you are actually the perfect example of that. You're the 1st female contributor on Piazza, yet ranked on 20th overall; and **on all of your contributions, only 16% are actual answers.** On the other hand, **some of the top male contributors made less contributions than you overall, but up 60% of their contributions were answers,** which got them more points.

# Perspective



## Class Forum



# Methodology

## Classes

CS3 - Data Structures and Algorithms

- 2 quarters
- 341 students
- 76.83% male
- 23.17% female

CSOS - Operating Systems

- 8 quarters
- 1,519 students
- 75.84% male
- 24.16% female

## Participation Scoring

Lecture

- Asking and answering questions in class

Forum

- Posting questions, answers, comments on online class forum

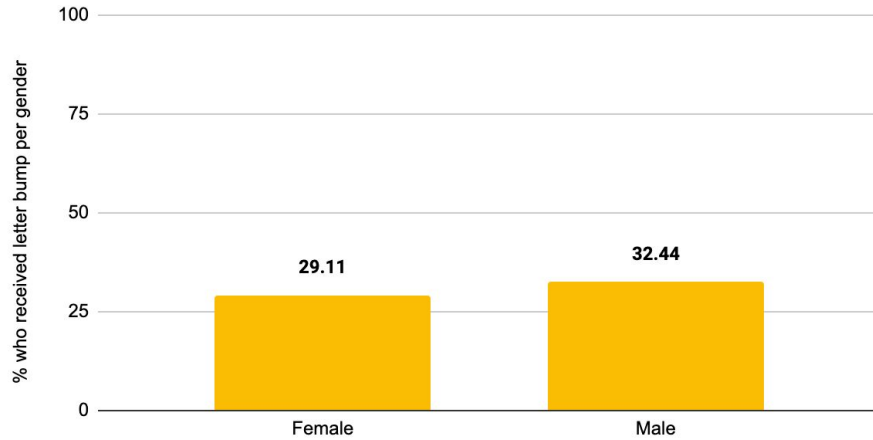
Survey

- Completing class evaluations (official UCD course evaluation, professor-created surveys)

# Letter Bumps

Letter Bumps by Gender

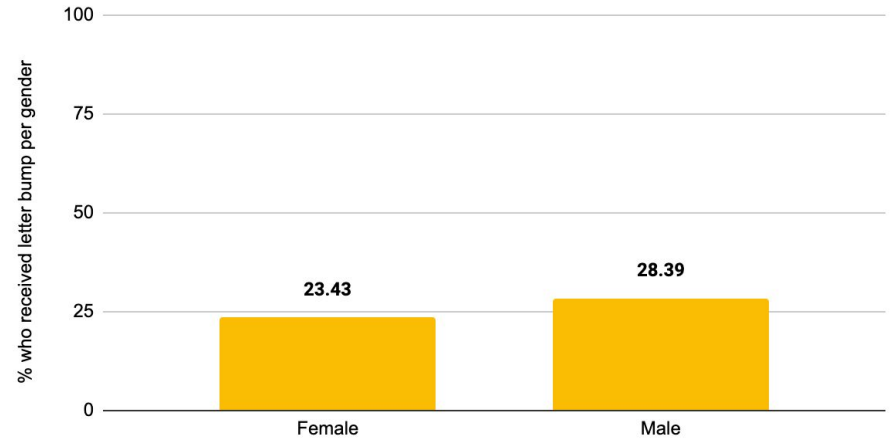
CS3



( $z = -0.56$ ,  $p = .575$ )

Letter Bumps by Gender

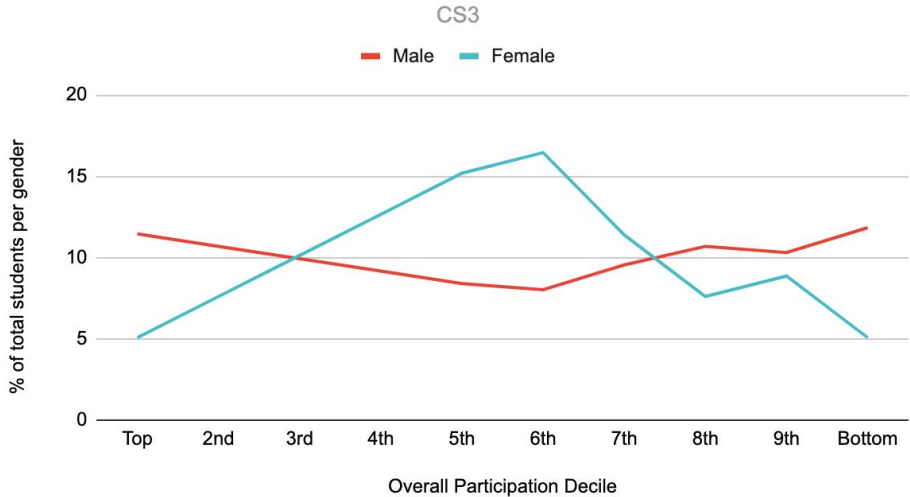
CSOS



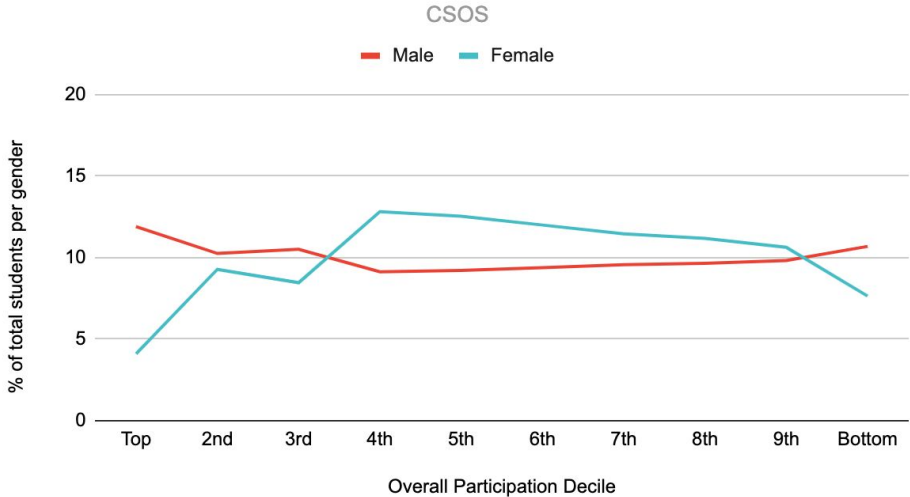
( $z = -1.86$ ,  $p = .063$ )

# Overall Participation

### Decile Distribution of Overall Participation Scorers



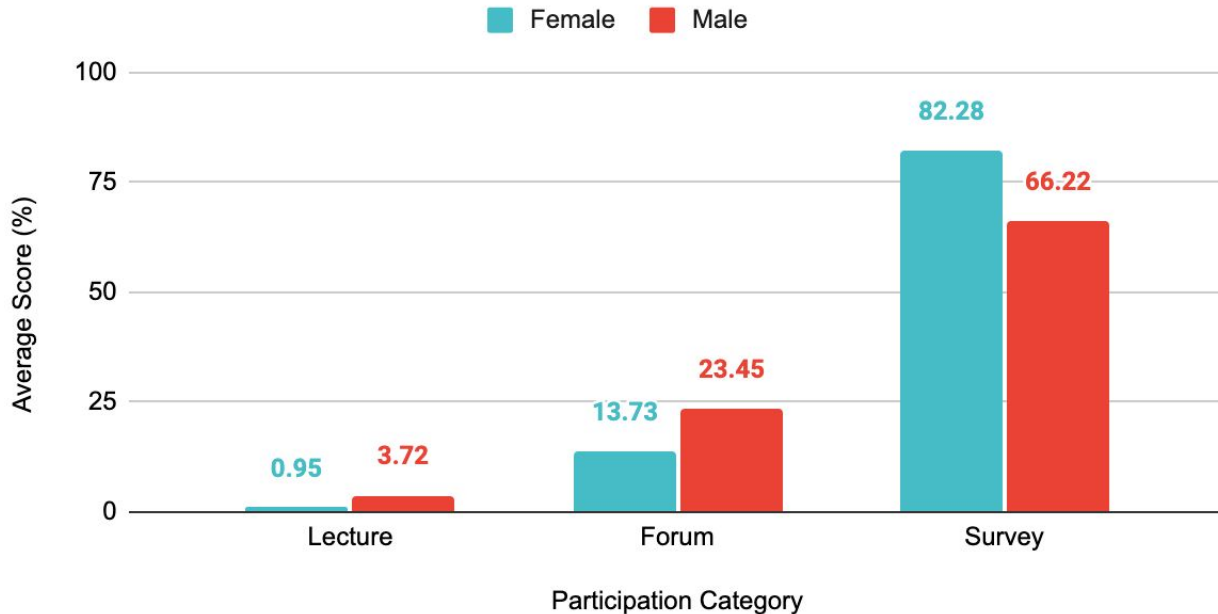
### Decile Distribution of Overall Participation Scorers



# Category Averages

## Gender vs Participation Scores

CS3



### Lecture

Male average 3.92 times  
female average

( $t_{(339)} = 2.24, p = .026$ )

### Forum

Male average 1.71 times  
female average

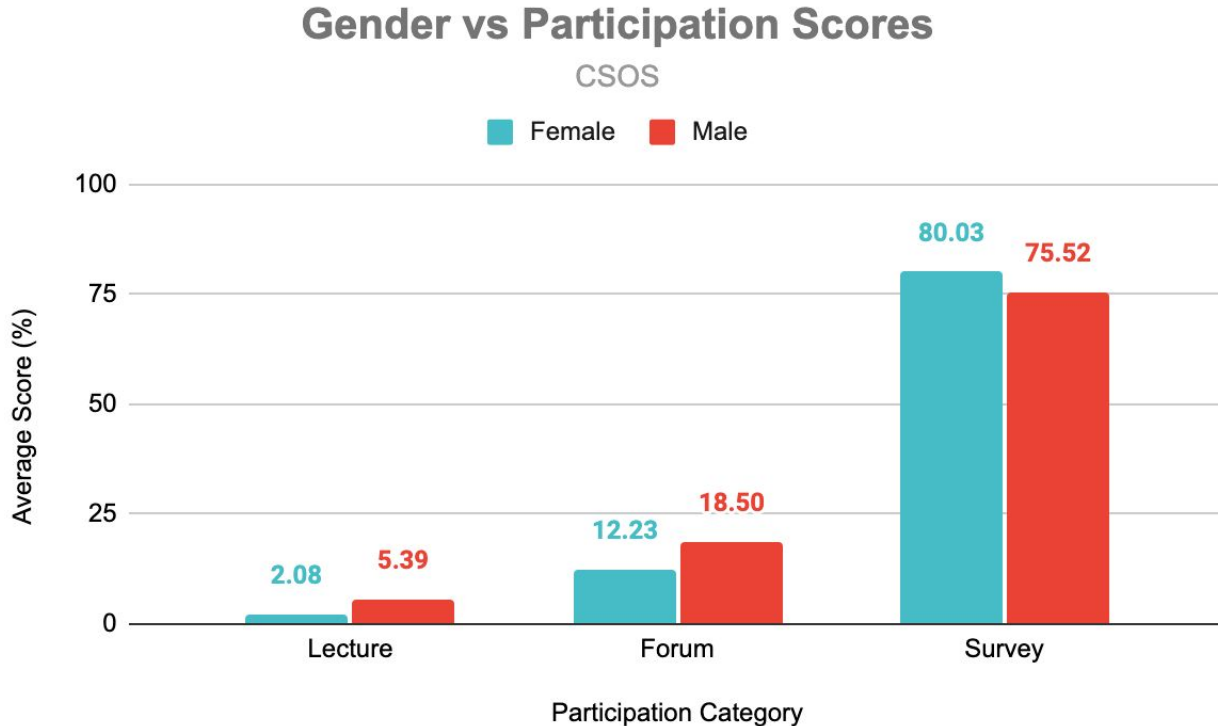
( $t_{(339)} = 3.17, p = .002$ )

### Survey

Female average 1.24  
times male average

( $t_{(339)} = -3.74, p < .001$ )

# Category Averages



## Lecture

Male average 2.59 times  
female average

( $t_{(1130)} = 3.57, p < .001$ )

## Forum

Male average 1.51 times  
female average

( $t_{(1517)} = 4.92, p < .001$ )

## Survey

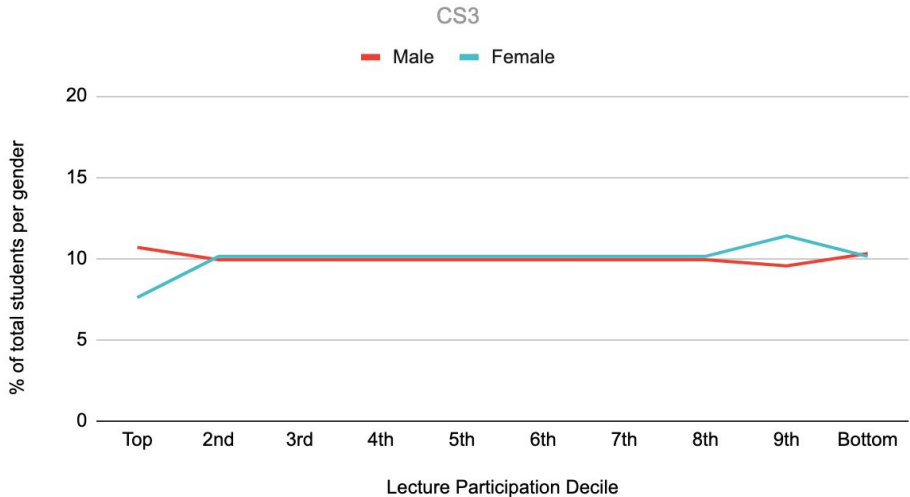
Female average 1.06  
times male average

( $t_{(1517)} = -2.41, p = .016$ )



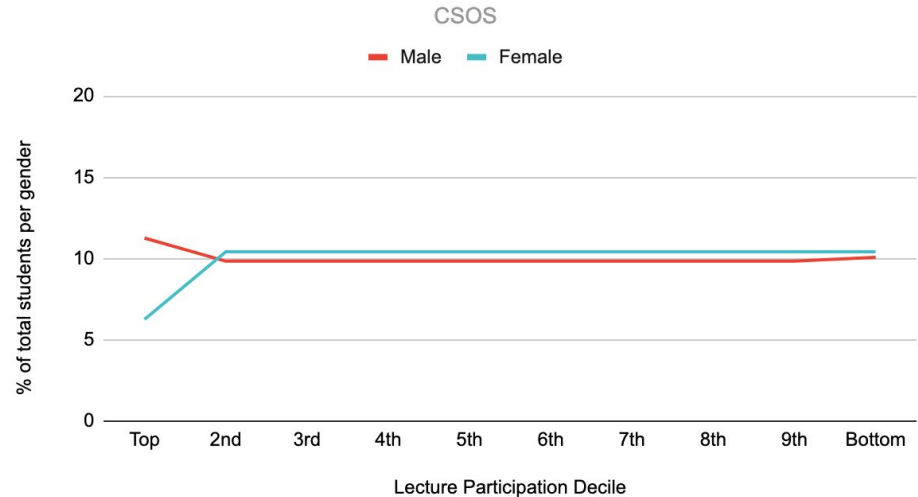
# Lecture Participation

## Decile Distribution of Lecture Participation Scorers



**only 5.57% of students participated**

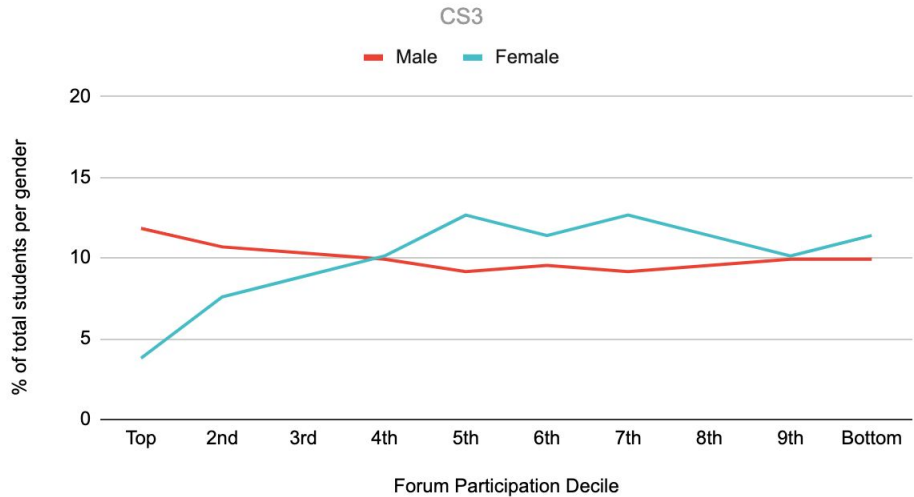
## Decile Distribution of Lecture Participation Scorers



**only 8.30% of students participated**

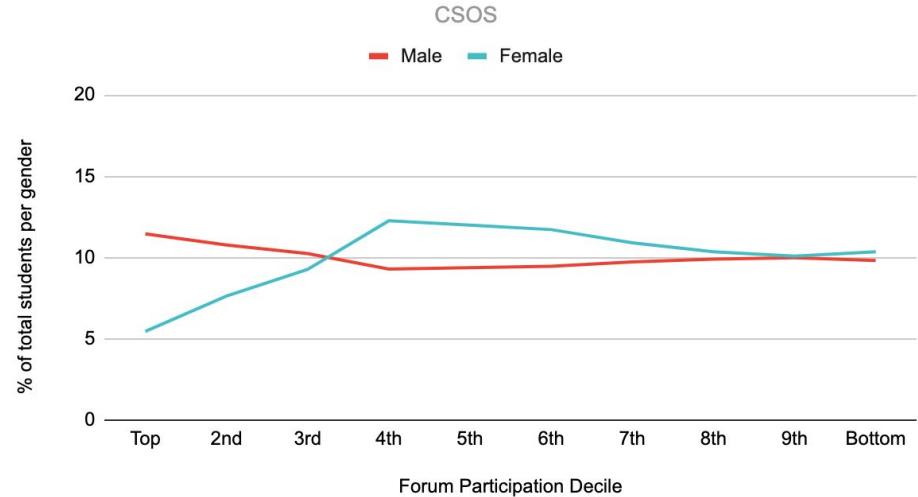
# Forum Participation

## Decile Distribution of Forum Participation Scorers



**75.07% of students participated**

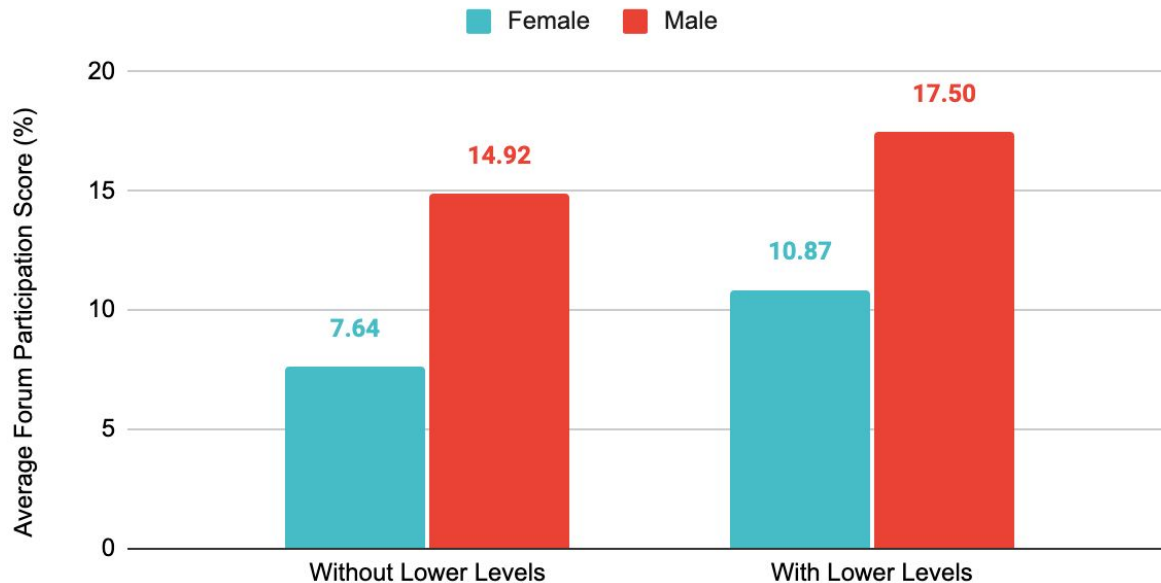
## Decile Distribution of Forum Participation Scorers



**62.48% of students participated**

# Rewarding Lower Levels of Forum Participation

Gender vs Benefit of Added Forum Levels  
CSOS



## Without Lower Levels

Male average 1.95 times  
female average

( $t_{(969)} = 5.00, p < .001$ )

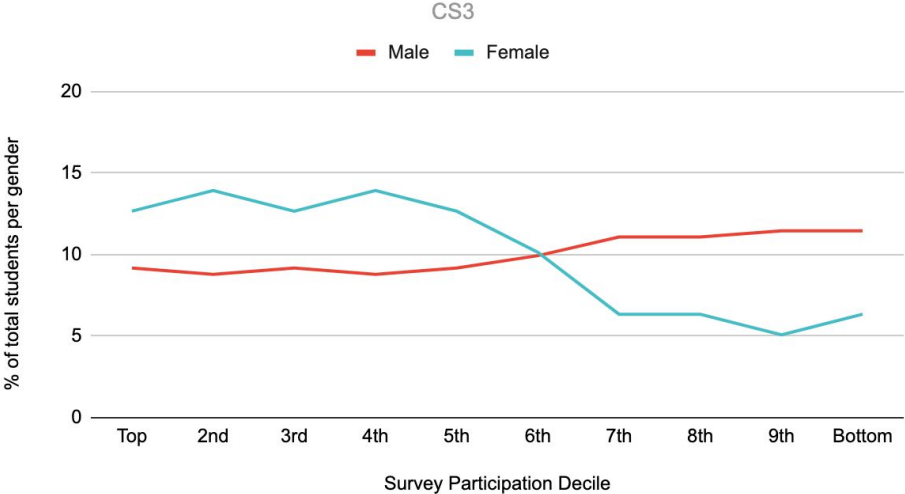
## With Lower Levels

Male average 1.61 times  
female average

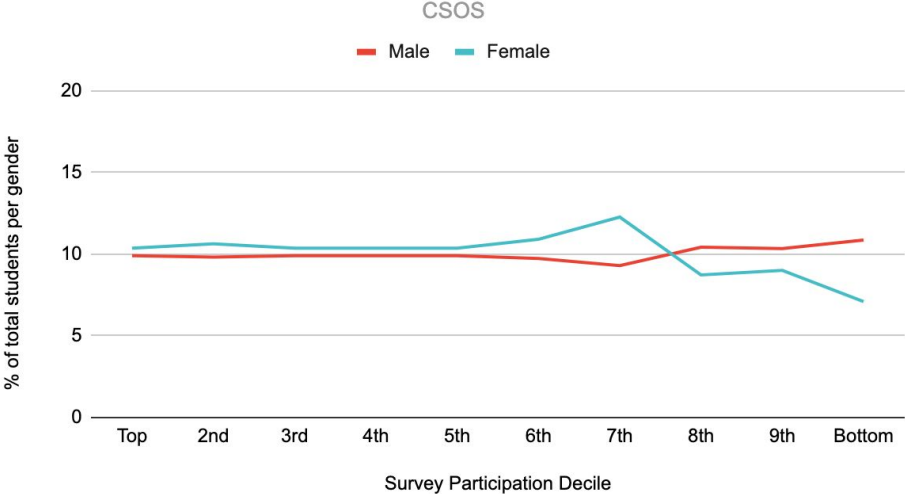
( $t_{(969)} = 4.84, p < .001$ )

# Survey Participation

### Decile Distribution of Survey Participation Scorers



### Decile Distribution of Survey Participation Scorers



# Takeaways - Overall Observations

- Males dominate most public forms of participation
  - **Top participation scorers can shape the perception of the class**
- Males and females benefit from participation at same rate
- Higher female participation in less public settings
- Similar trends in lower and upper division course

# Takeaways - Mitigations

- Instructors should vary their measures of participation
- **Rewarding survey completion and lower levels of forum participation reduces gap between male and female participation scores**
- Further research on what drives differences in participation between students of different backgrounds