Using Departmental Surveys to Assess Computing Culture: Quantifying Gender Differences in the Classroom

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The Problem

❑ Reports from some students (particularly women)
- Feeling uncomfortable working in CS lab
  - Non-inclusive, sometimes hostile behavior
- Intimidating, "know-it-alls" in classroom
- Feelings of "not having what it takes"

❑ We did not have the full story
- Were these unusual, isolated incidents?
- Was there a bigger problem?
- Were there other problems we didn't know about?

Our First Step

❑ Survey all students about departmental environment to get a full picture
- What types of problems?
- How much of a problem?
- How best to address the problems?

The Survey: Part 1

❏ Information about themselves

- Year

- Gender

- CS major, minor or neither

- Number of CS classes taken

- Anonymous otherwise

The Survey: Part 2

❑ Quantitative Questions:

1) Rate CS classes compared to other department's classes on intellectual rigor

   (0) much less rigorous (1) less (2) same (3) more (4) much more

2) Rate amount of class participation in CS classes to ideal amount

   (0) much less (1) less (2) ideal (3) more than ideal (4) too much

3) Rate your comfort participating in CS classes compared to in other departments' classes

   (0) much less comfortable (1) less (2) same (3) more (4) much more

4) Rate your interaction with CS faculty compared to other college faculty

   (0) much worse (1) worse (2) same (3) better (4) much better

The Survey: Part 3

❑ Open-Ended Questions:

1) Is the CS lab conducive to working on CS assignments? What are good and bad aspects of the lab?

2) What do you think are good things about the department?

3) What are some things you would like to see improved about the department?

4) If there are things you would like to see changed, in what ways could these changes be implemented?

Results: 2002
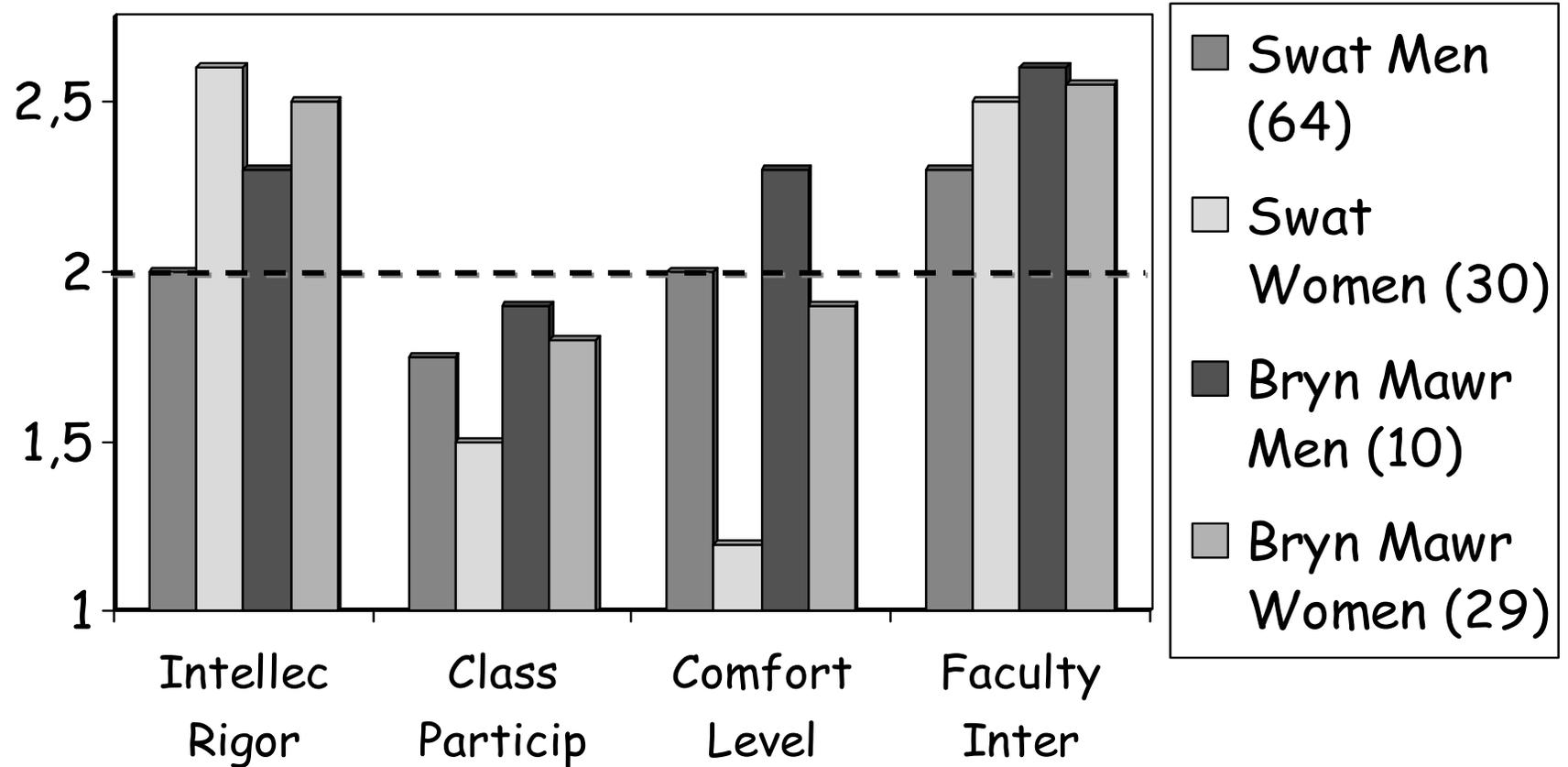
Large disparity between Swat men & women in comfort levels

Results of Part 3

❑ Swarthmore's Lab Environment:

Many male and female students mentioned problems with loud, obnoxious, disruptive, "boy's club" atmosphere

• Male students tend to describe it as "annoying" and "loud"

• Female students describe it as "intimidating", "isolating", and "hostile"

Swat's Classroom Environment:

❑ Many mentioned behavior of "know it all" students hurting the learning environment:

  • Answering other students' questions to the professor

  • Making negative comments about others' questions

  • "Wise-cracks" about a discussion topic

  • "Needing to demonstrate what they know by supplementing the lecture material with obscure, often incorrect information"

❑ Similar differences in males and females reactions to the same behavior

Interpretation of Results

❑ **Female students**

- Relationship between lower comfort level and negative behaviors of some students

❑ **Male students**

- Mentioned similar negative behaviors of some students, but no obvious negative effect on their own comfort levels

Swat's Response to the Results

❑ Make students aware of the issues

- Presented and discussed survey results

❑ Efforts to improve environment

- Lab rules
  - Post & explain why we think they are important
- Classroom atmosphere
  - Class participation rules
  - Pair programming in intro courses
- Programs for female students
  - Lunches, Mentoring, Study Sessions
- Developing better CS community
  - CS colloquium lunches with faculty and students

Results: 2003
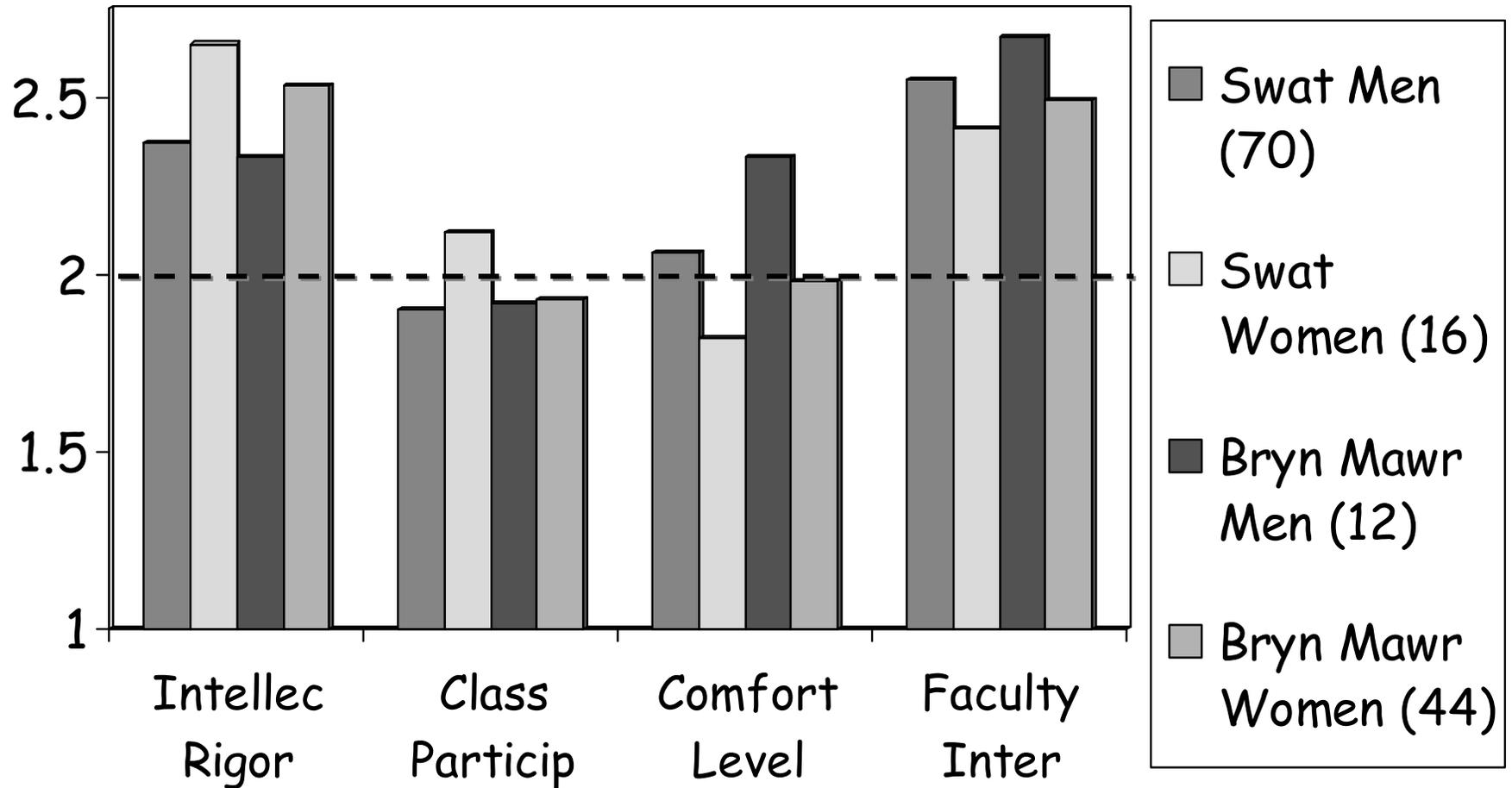
Percentage of Female Students
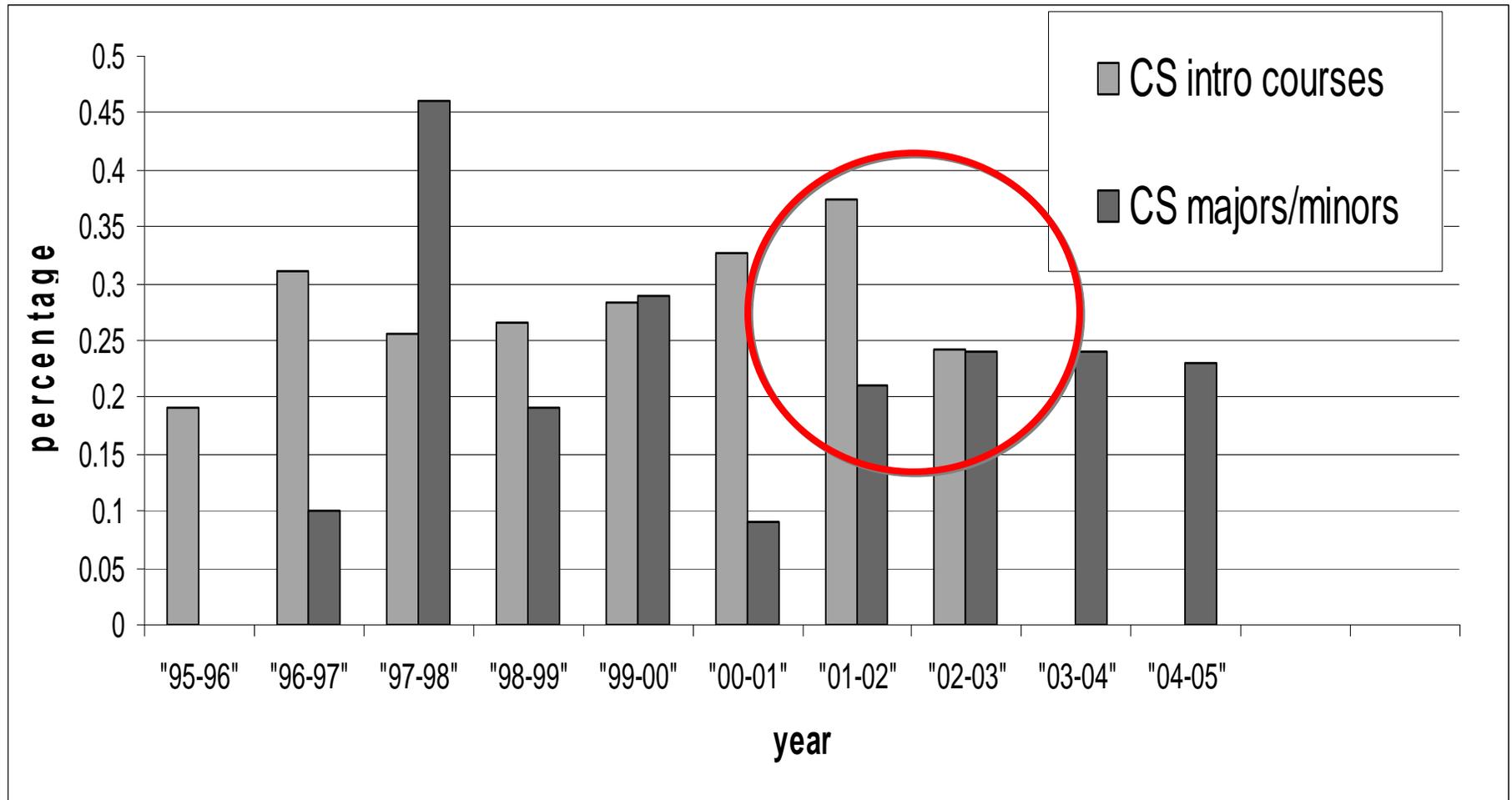
Interpretation of Results

❑ **Numbers are better all around**

- Several respondents mentioned vast improvement in lab environment from last year

❑ **Conclude:**

- It appears that our responses to last year's survey results may be helping to solve the problems

What We Learned

- ❑ Writing a good survey is hard
  - Removing our biases/opinions

- ❑ Surveying is important to understanding the state of one's department
  - What are the problems?
  - How pervasive are they?
  - Do they affect one group more than another?

- ❑ Just the act of surveying seems to improve students' view of department
  - Demonstrates that we care about how our environment affects our students