



# *Gender Differences on Multiple-Choice Conceptual Tests*

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# *Is Our Course for Scientists and Engineers Gender-Fair?*

- **Course and students**
- **Where do women start on the FCI?**
- **What is gender-fair instruction?**
- **Results**
- **Conclusions**



## *Introductory Physics for Scientists and Engineers*

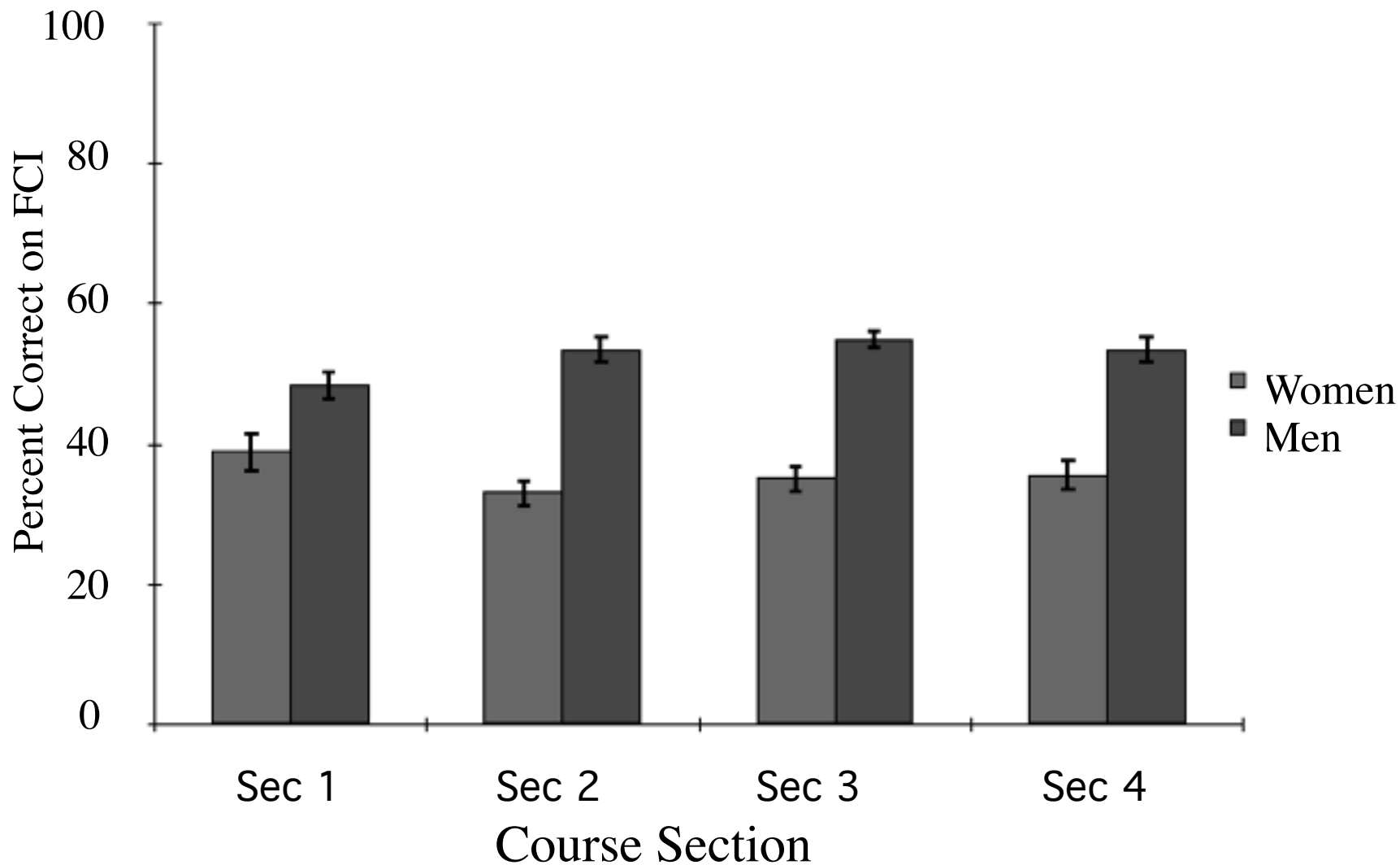
| Lecture section | Women | Men |
|-----------------|-------|-----|
| 1               | 34    | 91  |
| 2               | 30    | 99  |
| 3               | 47    | 145 |
| 4               | 34    | 87  |

- Different lecturers, different TAs
- Same syllabus, same final
- FCI\* pretest given in lab during first week
- FCI post-test given as part of final

\*Hestenes, Wells, Swackhamer *Phys. Teach.*, 30, 141-151 (1992)



## *FCI Pretest Scores for Men and Women*



I = Std. Error w/ Mean



# *What is Gender-Fair Instruction?*

## Three ways to look at it:

- Both men and women have **equivalent post-test FCI** scores.
- Both men and women gain the same amount on the FCI. **Absolute gain** is the same.

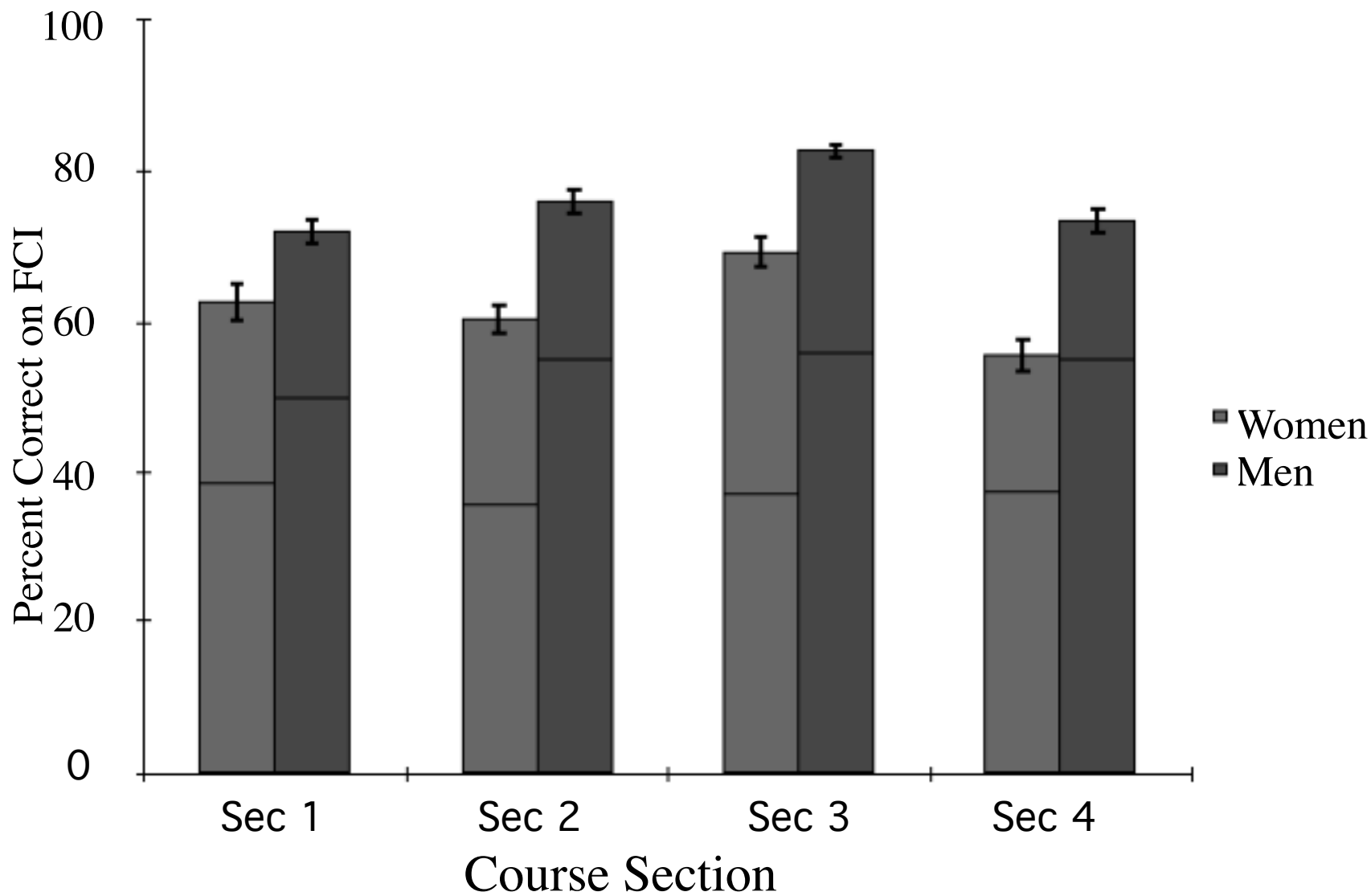
$$\text{Gain} = \text{posttest} - \text{pretest}$$

- Both men and women gain the same amount of their possible gain. **Relative gain** is the same.

$$\text{Relative Gain} = \frac{\text{Gain}}{\text{Possible Gain}} = \frac{\text{posttest} - \text{pretest}}{29 - \text{pretest}}$$



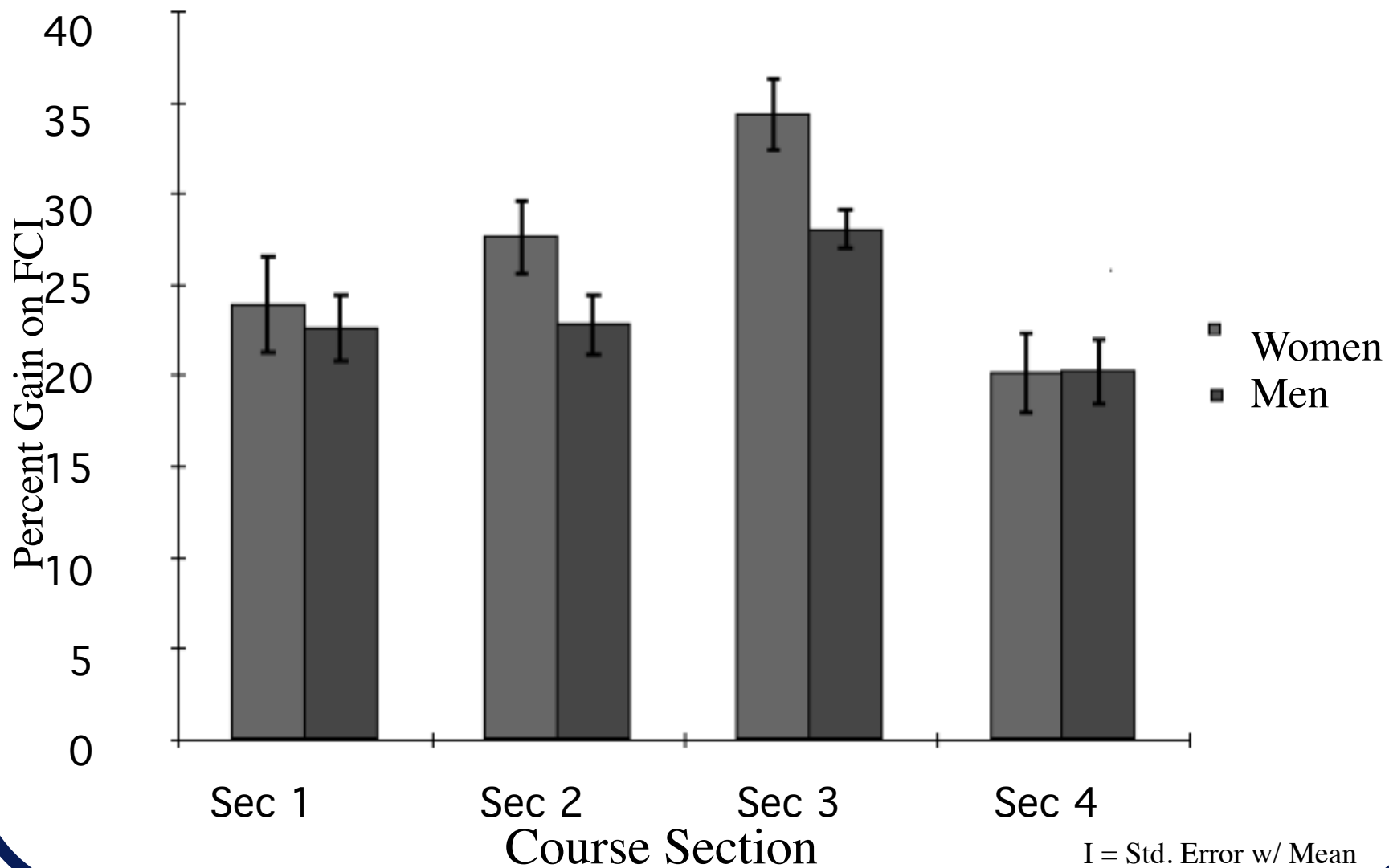
## *Equivalent Post-test Model*



I = Std. Error w/ Mean

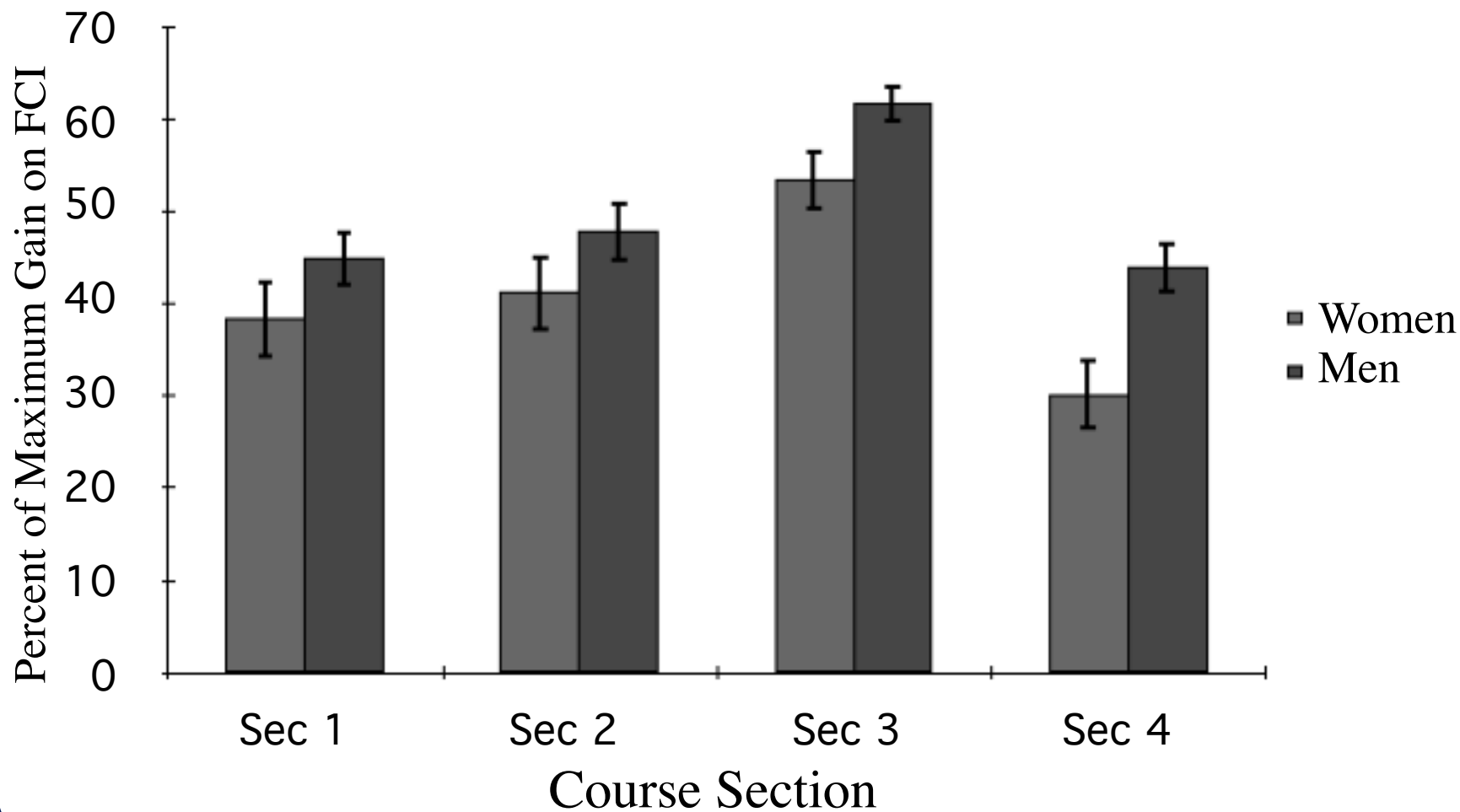


## *Absolute Gain Model*





## *Relative Gain Model*



I = Std. Error w/ Mean





## *Is Our Course for Scientists and Engineers Gender-Fair?*

- Women start out with a lower FCI score.
- **Equivalent Post-test Model:** Men end up with a higher FCI score.
- **Absolute Gain Model:** Women gain more on the FCI than men.
- **Relative Gain Model:** Men gain more of their potential gain.