FACTORS AFFECTING GENDER DISPARITY IN INTRODUCTORY PHYSICS

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What is the gender gap?
Outline

- What is the gender gap?
- What causes it?
What is the gender gap?

What causes it?

What can we do about it?
What is the gender gap?

Force Concept Inventory posttest scores

![Bar chart showing average scores for men and women. Women's score is approximately 40%, while men's score is approximately 60%.]
What is the gender gap?

Force Concept Inventory posttest scores

average score (%)

gender gap

0 20 40 60 80 100

men
women
What is the gender gap?
What is the gender gap?

![Bar chart showing the gender gap in average scores. The bar for women is much lower than the bar for men, indicating a significant gender gap.](chart.png)
What is the gender gap?

Gap is widespread
What causes the gender gap?
What causes the gender gap?

Is it cultural?

FCI posttest

gender gap (%)

US
What causes the gender gap?

The chart illustrates the gender gap in FCI posttest scores between the US and Belgium. The gender gap is significantly higher in Belgium compared to the US.
What causes the gender gap?

Strong dependence on culture!
What causes the gender gap?

What is the effect of precollege education?
What causes the gender gap?

Everyone gains...

![Graph showing average scores for FCI pretest and men across none, HS, and AP qualifications.](image-url)
What causes the gender gap?

... but gap persists ...
What causes the gender gap?

...and women underrepresented in AP courses
What can we do about the gender gap?
What can we do about the gender gap?

Compare three pedagogies:

- Traditional lecture (T)
- Interactive lecture (I)
- Interactive lecture and sections, reading assignments (I⁺)
What can we do about the gender gap?

Does pedagogy help?

![Bar chart showing average scores for women and FCI pretest across different conditions T, I, I+](chart.png)
What can we do about the gender gap?

Does pedagogy help?

![Bar chart showing average scores in FCI pretest and men groups for different conditions T, I, I+](image)
What can we do about the gender gap?

Does pedagogy help?

![Bar chart showing FCI posttest scores for different groups (T, I, I+) with average scores ranging from 0 to 100%](chart.png)
What can we do about the gender gap?

Yes, pedagogy narrows gap
What can we do about the gender gap?

Who are the low-gain students?

- Pretest: 70%
- Posttest: 90%
- 20% gain
What can we do about the gender gap?

Traditional class

![Graph showing the relationship between pretest score and gain for women in a traditional class.](image)
What can we do about the gender gap?

Traditional class
What can we do about the gender gap?

Traditional class: gender imbalance

![Graph showing the relationship between pretest scores and gain percentages for men and women in traditional classes. The graph demonstrates a gender imbalance with women generally having lower gains regardless of their pretest scores.](image)
What can we do about the gender gap?

Interactive class

![Graph showing the relationship between pretest score and gain with data points for men and women.](image)
What can we do about the gender gap?

Interactive class: gender balance

![Graph showing the relationship between pretest score and gain, with different markers for men and women.](image-url)
Gap comes from culture and background
Gap comes from culture and background

Interaction makes a difference!
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For a copy of this talk and additional information:

http://mazur-www.harvard.edu
Confidence intervals on gender gap

pretest gap

average score (%)
Confidence intervals on gender gap

Posttest gap

Average score (%)

T  IE  IE+$

0  20  40  60  80  100