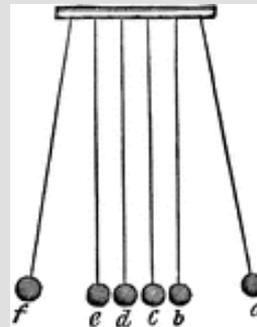


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# Belonging in Science



Lauren Aguilar

PARADIGM

&

Department of Psychology, Stanford University

# **DIVERSITY & INCLUSION IN SCIENCE**

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**DIVERSITY**

**=**

**CREATIVITY**

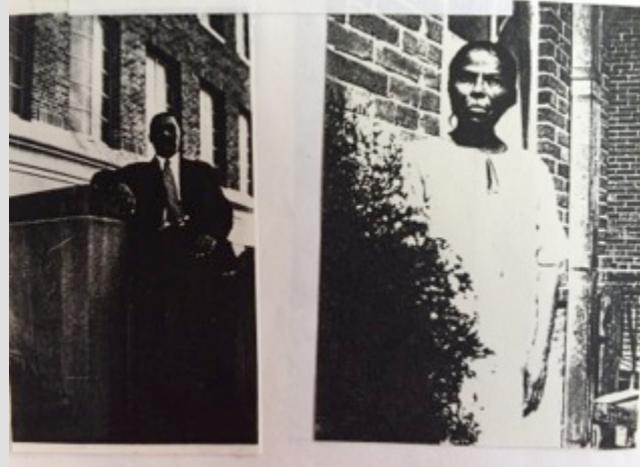
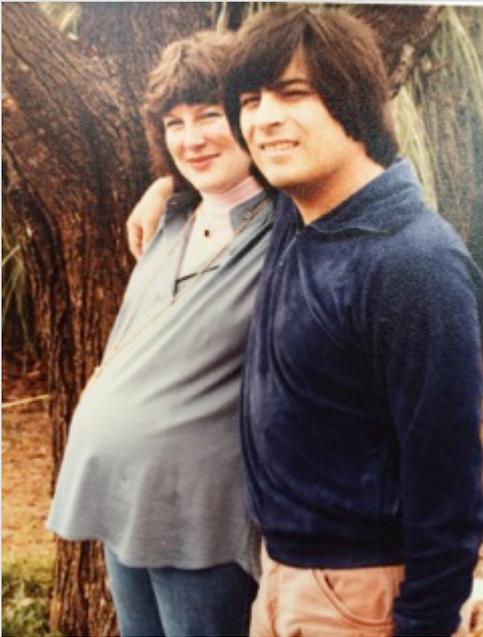
**DECISIONS**

**PRODUCTIVITY**

**\$\$\$**

# MY BELONGING STORY

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# YOUR BELONGING STORY

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# FUNDAMENTAL NEED TO BELONG

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# QUESTIONS OF BELONGING

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- Do I belong in a physics class?
- Will the teacher and the other students respect me?

# CUES OF (NOT) BELONGING

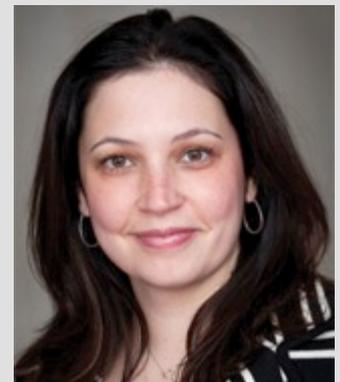
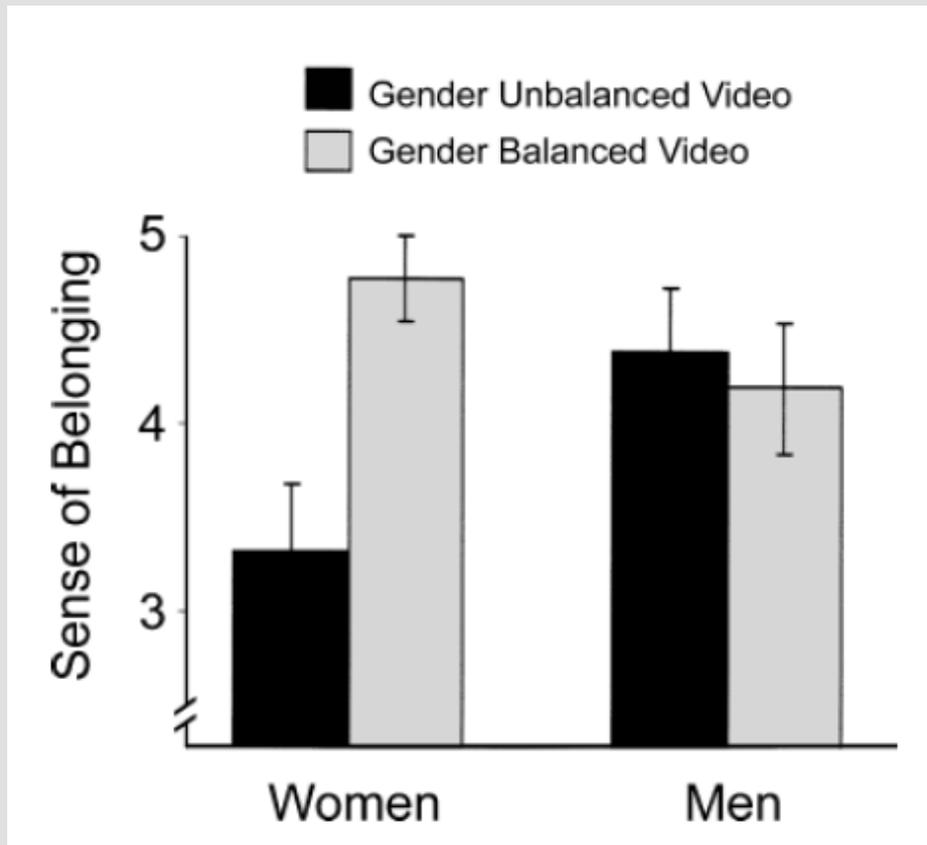
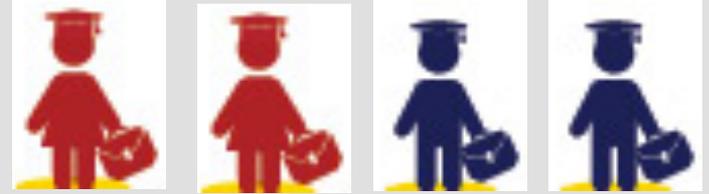
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- STEREOTYPES
- ENVIRONMENT
- SOCIAL-INTERPERSONAL

# WOULD I BELONG?



vs.



# WOULD I FIT IN?

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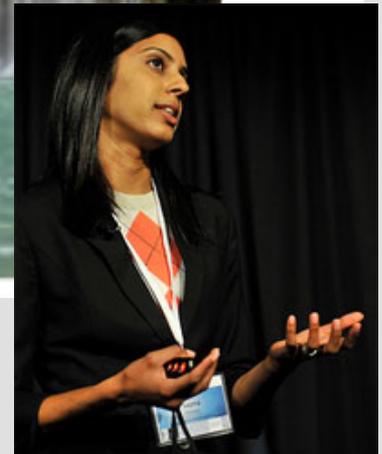
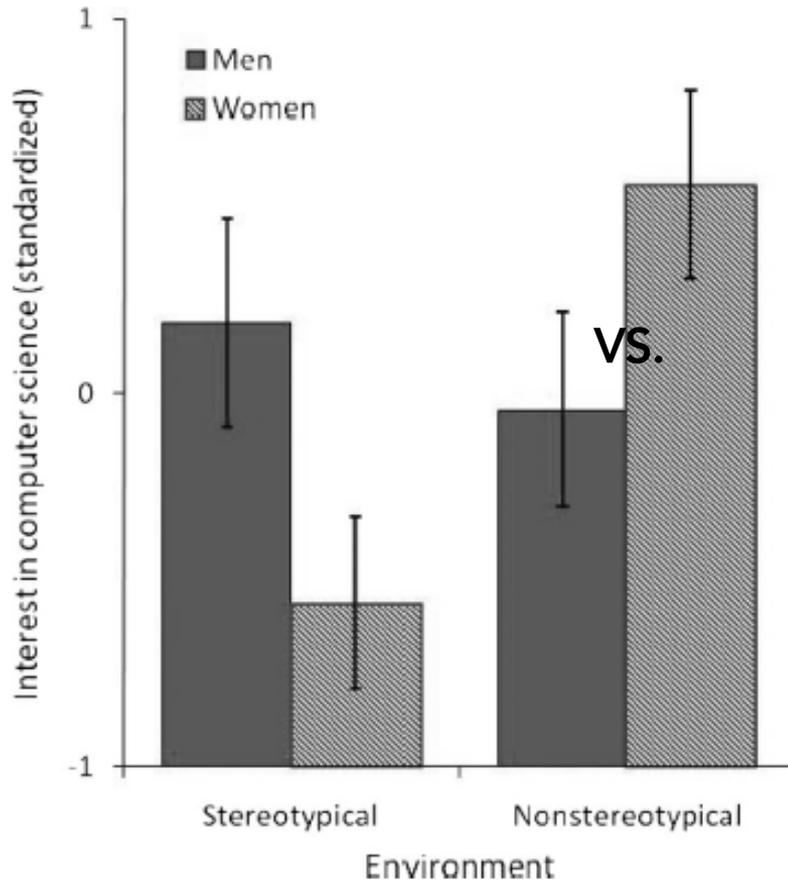


VS.

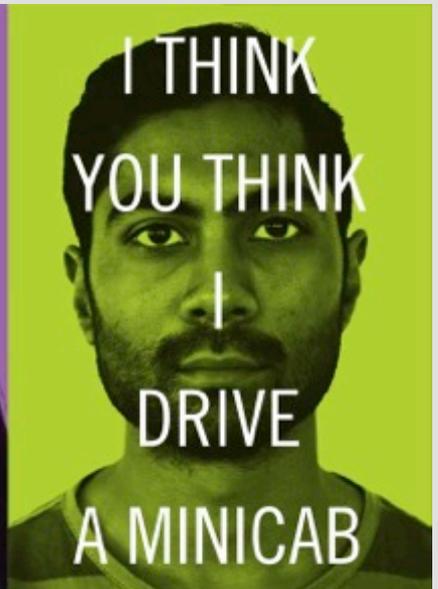
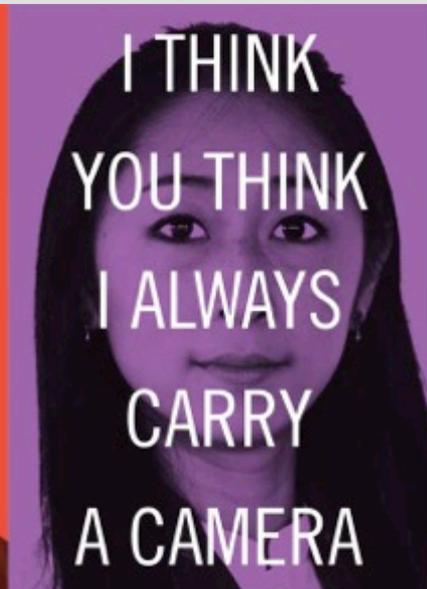
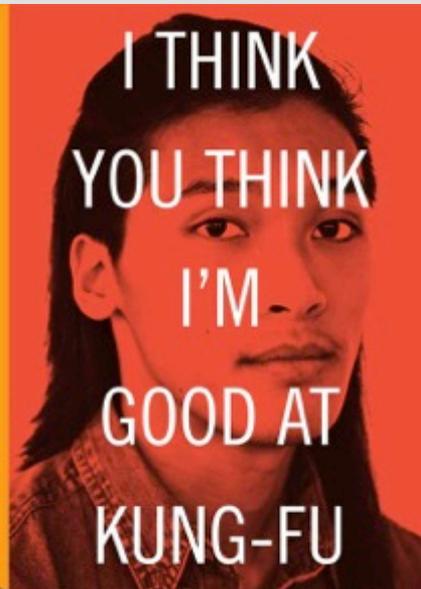
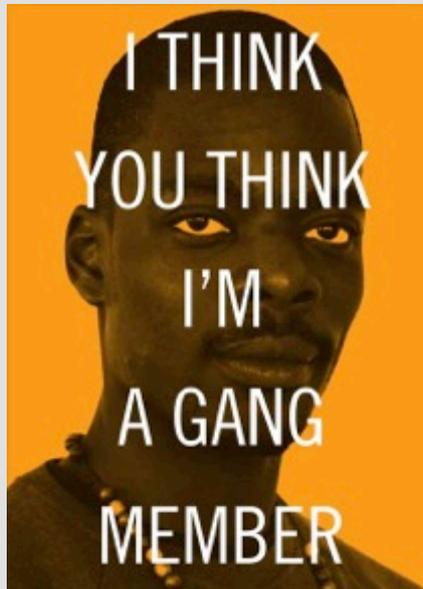


(Cheryan, Plaut, Davies, & Steele, 2009)

# WOULD I FIT IN?



(Cheryan, Plaut, Davies, & Steele, 2009)



# DIVERSITY STRATEGIES

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- Increase belonging
  - Change mindsets about belonging in STEM
- Microinclusions
  - Men in STEM = diversity allies

# MICROINCLUSIONS

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- A feeling of working together in STEM with male peers
  - Sense of connection to peers
  - Increase belonging



## Tip

Hey Sarah,

I find this helpful: It is sometimes faster to plug in numbers (a bunch of different numbers like positive numbers, negative numbers, zero) rather than trying to solve the equation.

Hope this helps you too!

-Daniel

# MATH EXAM PERFORMANCE





# PHYSICS FIELD STUDY

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- Introductory Physics at Stanford University
- Key gateway course to STEM majors



# STUDENTS' EXPERIENCES IN PHYSICS

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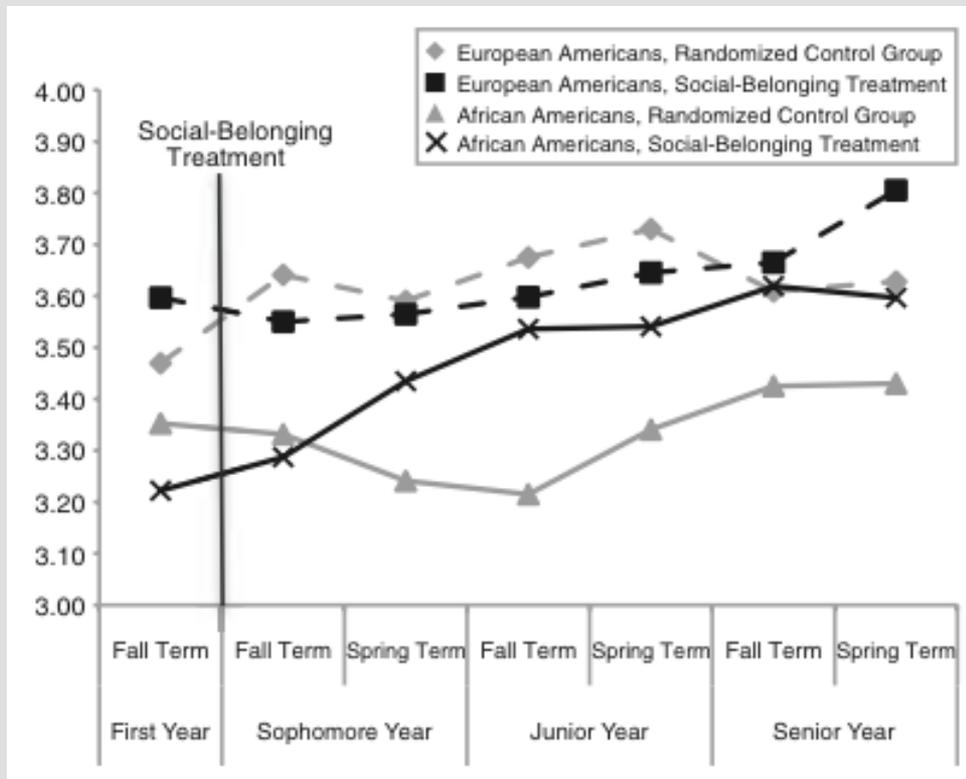
# FIELD STUDY OVERVIEW

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- Aim
  - To bolster women's sense of belonging & improve peer interactions in a large introductory physics course
  - Change perceptions and narrative

# SENSE OF BELONGING MESSAGE

- Positive narrative for interpreting adversity
  - Normal to worry about belonging
  - These worries dissipate with time



(Walton & Cohen, 2011)

# SENSE OF BELONGING INTERVENTION

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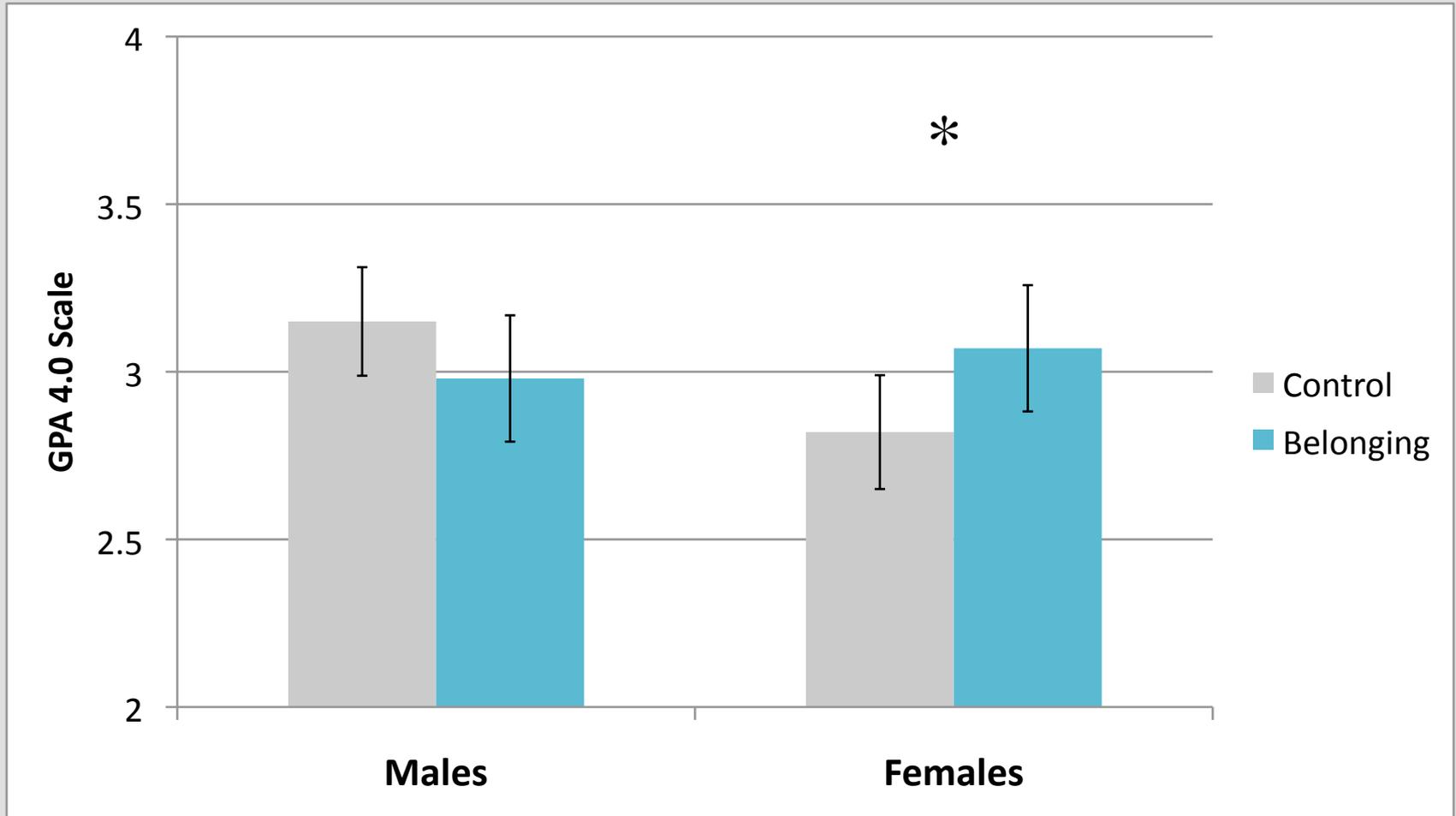
- Previous Students Survey & Quotes
  - Most students worried about whether they belonged in physics but grew confident in their belonging with time.
- Write essay describing how their own experiences echo the experiences in survey & quotes.

# BELONGING INTERVENTION QUOTE

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"...I *worried that I was different* from the other students and whether I had the right preparation...I *wasn't sure at first if I fit in*—if I would make friends, or find study partners, or if people would respect me. But eventually, *I realized that almost everyone worries at first about whether they fit in*, and feels isolated and insecure at times—it's a big class and it's challenging...Now it seems ironic—everybody feels like they are unprepared or different from everyone else..., *when really we're all going through the same things.*"

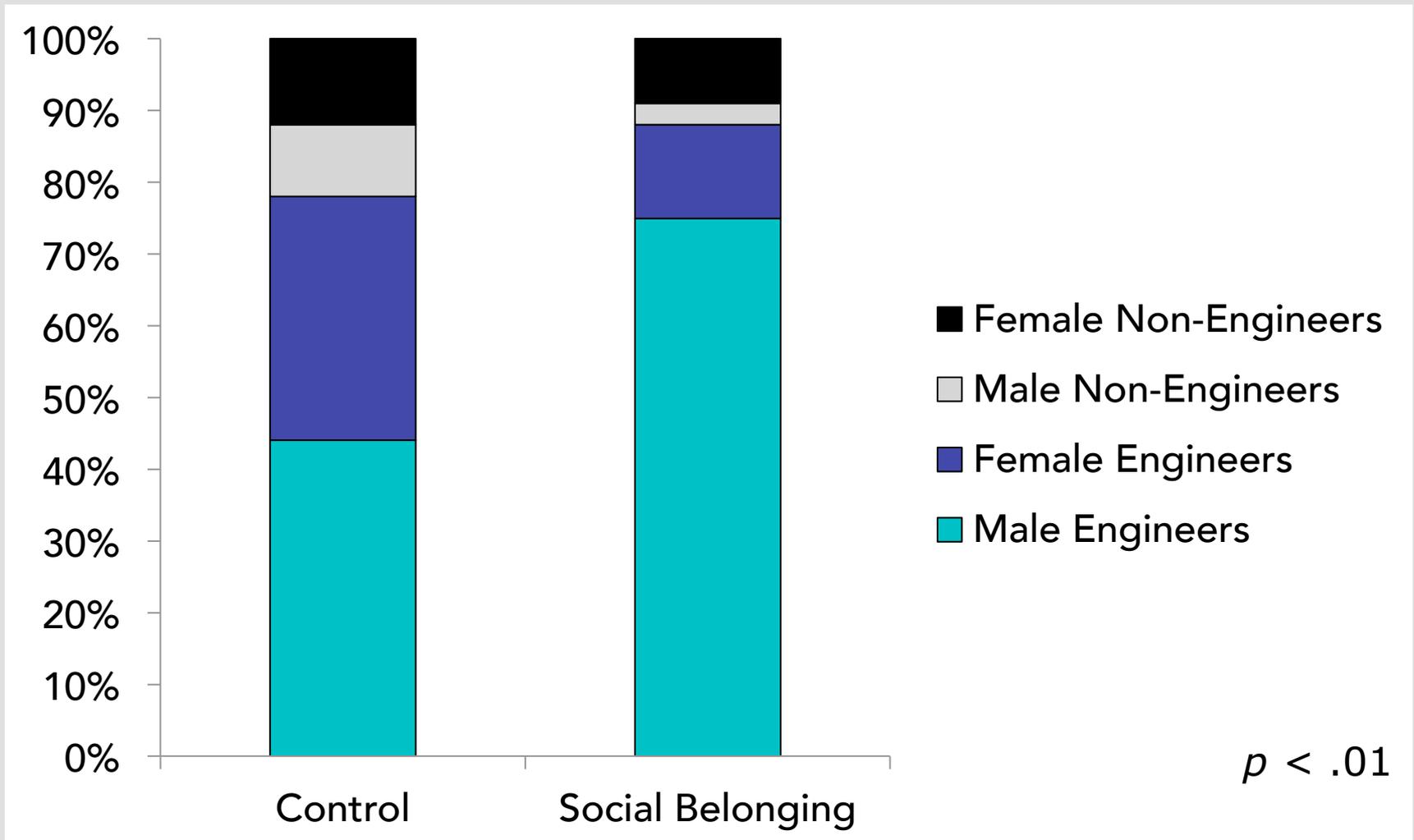
# STEM GPA IN QUARTERS DURING & AFTER STUDY



$F(1,227) = 7.95, p = .005$

\*  $p = .03$

# WOMEN'S STEM FRIEND NETWORKS



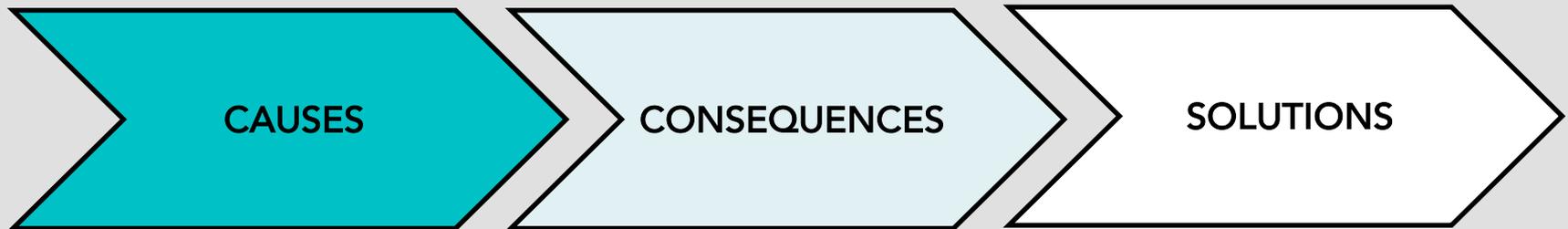
# THE POWER OF BELONGING

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- Buffers women from belonging worries
- Simple, brief, cost-effective
- Promise for improving women's achievement and persistence in science

# BELONGING IN PHYSICS

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## ■ SOLUTIONS

- Social context matters
- Community & peer connections
- Mentor support
  - High standards and assurance
  - Telling your (not) belonging story
- Interdisciplinary collaboration
- More...Growth mindset, setbacks as fresh starts, easeful bureaucracy.

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# STEM Women



# Thank you!

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## Collaborators & Wise Folks

- Greg Walton
- Patricia Burchat
- Chaya Nanavati
- Carol Dweck
- Carl Weiman
- Dweck-Walton Lab

## Stellar Research Team

- Pooja Desai
- Susan Chang
- Joseph Smeall-Villarroel
- Josh Davis
- Rosemary Callejas
- April Yang
- Amanda Smith
- Cliff Owl
- Jeremy Gilford
- Michael Nguyen
- Daniel Mrdjenovich
- Evelyn Plumb
- Russell Caughey
- Taelor Clay
- Imani Parker-Fong
- Veena Bansal
- Kale Futterman