Counteracting Stereotype Threat
Research-Based Tools and Tactics

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EIT Project Goal & Strategies

To create engineering learning environments that support the persistence and success of all students, especially diverse women and minority men, by:

- Distilling key social-science research findings
- Sharing practical teaching advice
- Delivering convenient live/recorded webinars
- Providing easy-adoption checklists/resources

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Catherine Good, Ph.D.

Catherine Good, Ph.D. is an associate professor of psychology at Baruch College of the City University of New York and a member of the graduate faculty at CUNY's Graduate Center. She earned a M.S. in mathematics (University of Kansas) and an Ad Hoc Interdisciplinary PhD in mathematics education and social psychology (The University of Texas at Austin.) Dr. Good's research program focuses on the social factors that impact students' academic achievement, learning, motivation, and self-image. She also develops interventions for students, teachers, and parents to facilitate the development of effective and engaged learners. Her work has received national attention as well as funding from the National Science Foundation, U.S. Department of Education, and National Institutes of Health.

"In the perception of society my athletic talents are genetic; I am a likely mugger-rapist; my academic failures are expected; and my academic successes are attributed to others. To spend most of my life fighting these attitudes levies an emotional tax that is a form of intellectual emasculation"

-Dr. Neil de Grasse Tyson

One reason for the lack of women at the highest professions in STEM is because of "….different availability of aptitude at the high end."
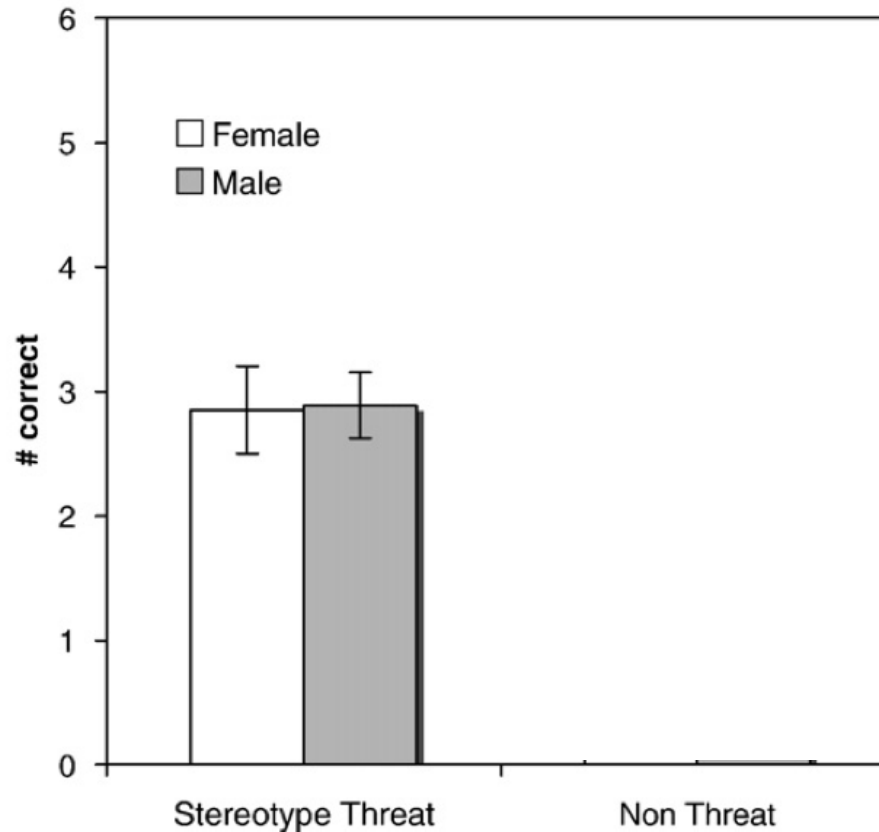
-Dr. Larry Summers

Stereotype Threat

Unpleasant apprehension arising from the awareness of a negative ability stereotype in a situation where the stereotype is relevant, and thus confirmable.
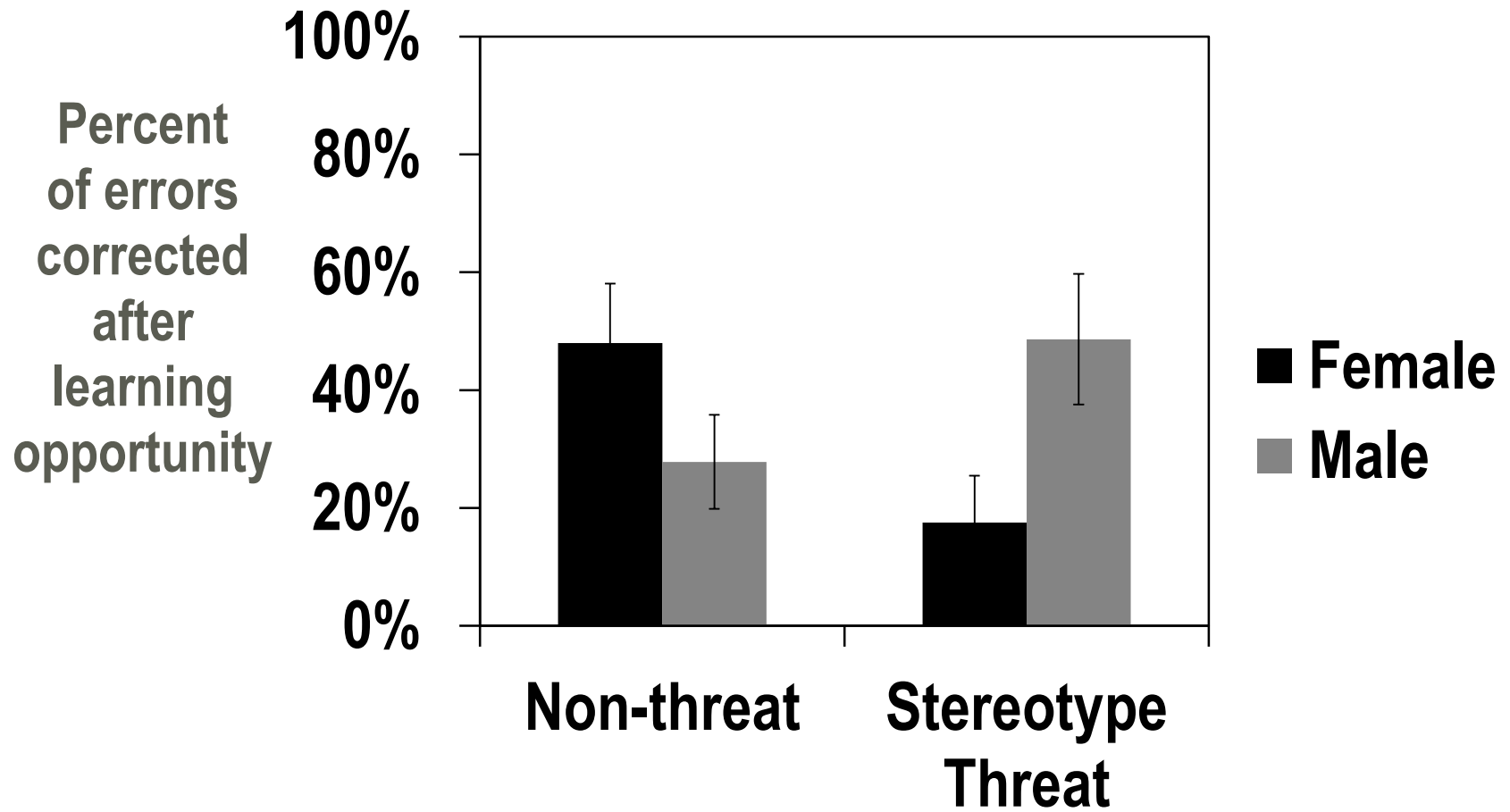
(Steele & Aronson, 1995)

Stereotype Threat Undermines Calculus Performance

Good, Aronson, & Harder, 2008

Stereotype Threat Undermines Learning

Good, Mangels, & Evelo, 2015

How Can Stereotype Threat be Reduced?

- Encourage Growth Mindsets

- Encourage Belonging Based on Effort/Engagement

- Re-attributions for Difficulty

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Growth Mindsets (Dweck, 1999)

Entity Theorists

Incremental Theorists

Intelligence is fixed

- <u>Trait</u> largely <u>determined</u> by nature

Intelligence is malleable

- <u>Quality</u> that can be <u>increased</u> through nurture

Desire similar outcome
- *achieving* good scores, doing "well"

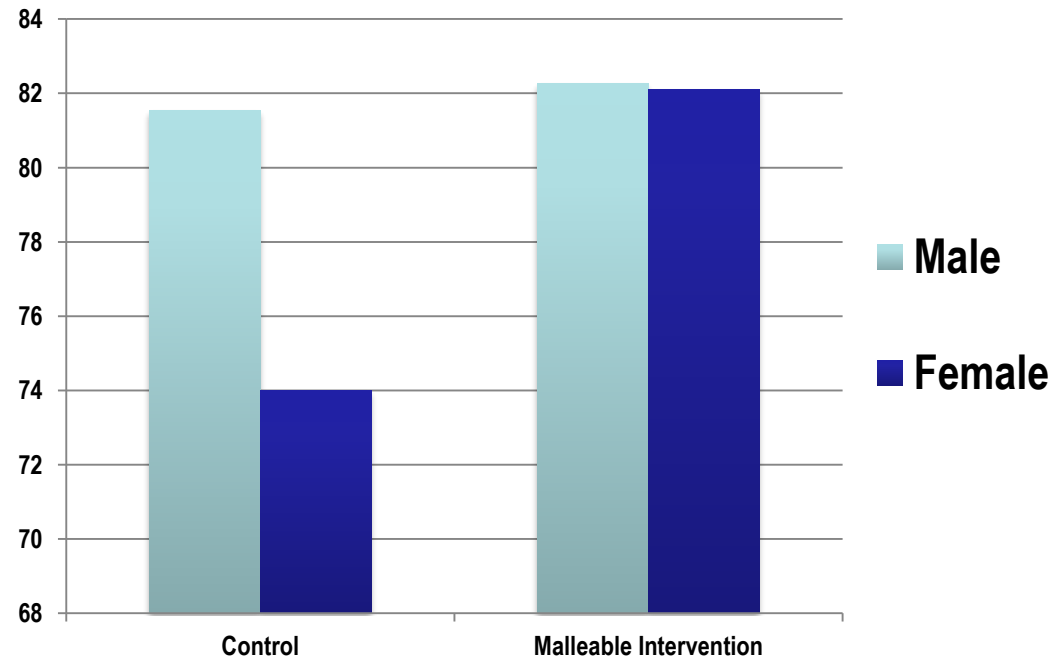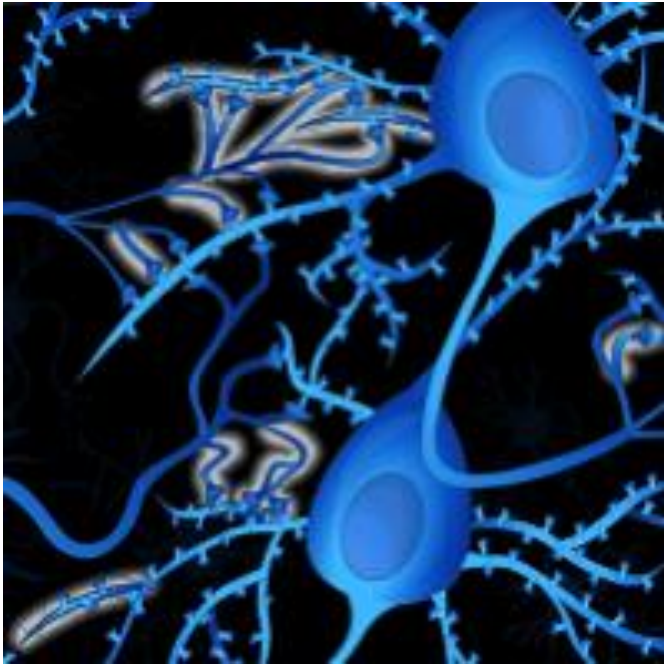Different *motivation* for pursuing this outcome

Performance goals

"The main thing I want when I do my school work is to show how good I am at it."

Learning goals

"In school I am always seeking opportunities to develop new skills and acquire new knowledge."

Mindsets That Reduce Stereotype Threat

Good, Aronson, & Inzlicht, 2003

Teachers' Theories of Intelligence Impact Pedagogical Practices

Teachers who hold an incremental theory of math intelligence, endorse teaching practices that

- Convey intelligence as malleable (e.g., focus on strategies for outcomes)
- Emphasize the role of effort in outcomes
- Increase opportunities to work on challenging problems

Provide him with challenging math tasks.
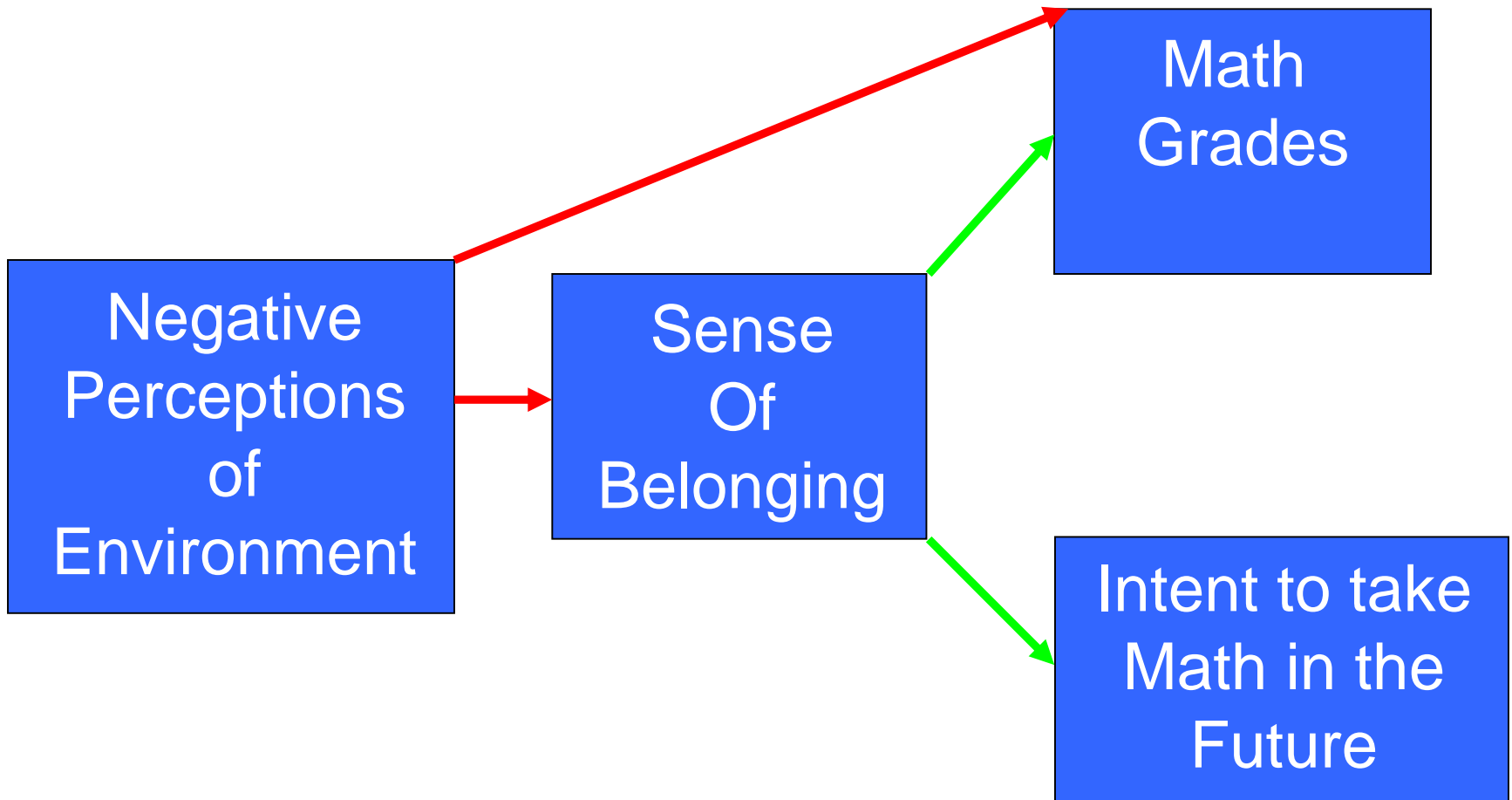
Rattan, Good, & Dweck, 2012
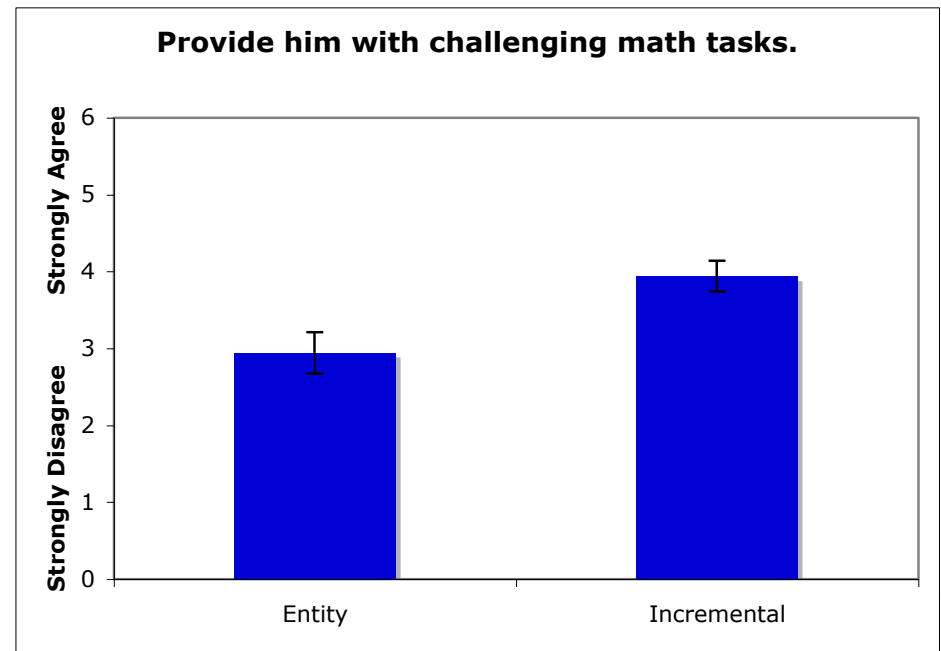
Belonging to The Stereotyped Domain

Sense of Belonging:

- Feeling like an accepted member of the academic domain whose presence and participation is valued by peers and instructors

The Role of Sense of Belonging

X^2 (20) = 46.82, p < .001, CFI = .84, NFI = .77, RMSEA < .004, Pclose = .95

Good, Rattan, & Dweck, 2012

Effort-Based Sense of Belonging

How to fit in and belong to math: Hard work

BY ALEX WARREN

WHAT HELPS STUDENTS to feel like they belong to math and why is it so important? On a recent June afternoon in a New Jersey school district, math teacher Michael Bolano stood in front of a group of 6th graders at a school assembly. "I was asked to come speak to you today to tell you about what can make students like you feel more like they belong to math."

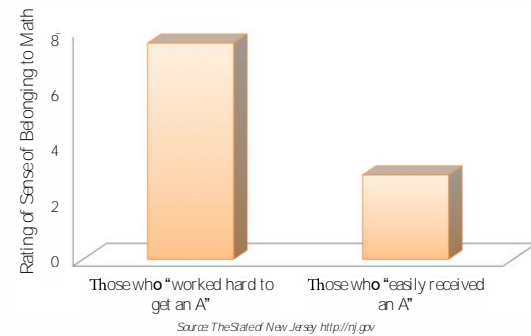He explained, "Teachers talk a lot about students who easily do well in math, but in my math classes that easy achievement doesn't matter that much. What really makes a 'math person' is *success through hard work*. The students who put in effort are the ones who truly belong to math."

Some research shows that Mr. Bolano's opinion might be correct. Several years ago, the school district asked a group of 6th graders like you how they felt about math. They also asked their math teachers about what kind of students they valued and respected the most in their classes.

Two years later, the school asked those same students, who were now in 8th grade, about their experience through

things that Mr Bolano o said that they "wor id that they fit in and later, these students th grade overall. They iddle school and that t

JUNE 6, 2012

Hard Work Boosts Belonging

Rating of Sense of Belonging to Math

Those who "worked hard to get an A" — Those who "easily received an A"

Source: The State of New Jersey http://nj.gov

succeed in difficult classes. These students seemed to be doing much better than the students who said they "easily earned an A."

The math teachers reported that they valued and respected the students who worked hard. On the other hand, students who passed the class with very little effort were less accepted by the math teachers than those who put a lot of work into the class.

Later, research also showed that the benefits of feeling like you belong continued throug who felt that they fit in a well in high school too.

Educators could use th better in middle school you will feel like you fit dents who easily do well. throughout middle schoo make you feel like you fit

What really makes a math person is suc*cess through hard work.*

The students who put in effort are the ones who truly belong in math.

Students who passed the class with very little effort were less accepted by the math teachers than those who put a lot of work into the class.

Effort-Based Sense of Belonging Protects Learning from Stereotype Threat

Percent of Errors Corrected After Learning Opportunity

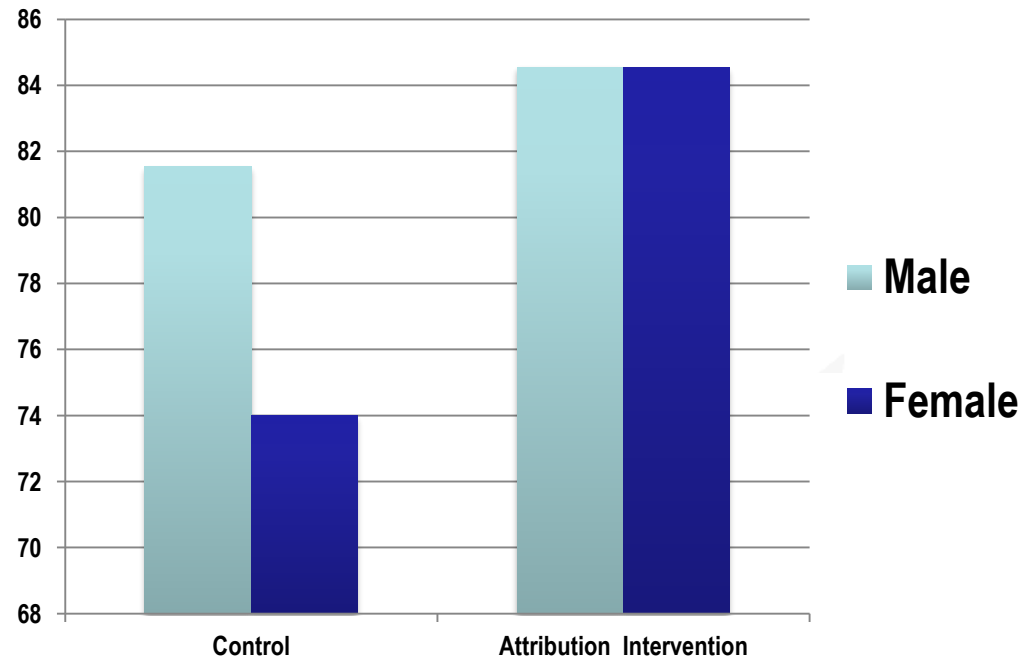Non-threat | Stereotype Threat

Female | Male
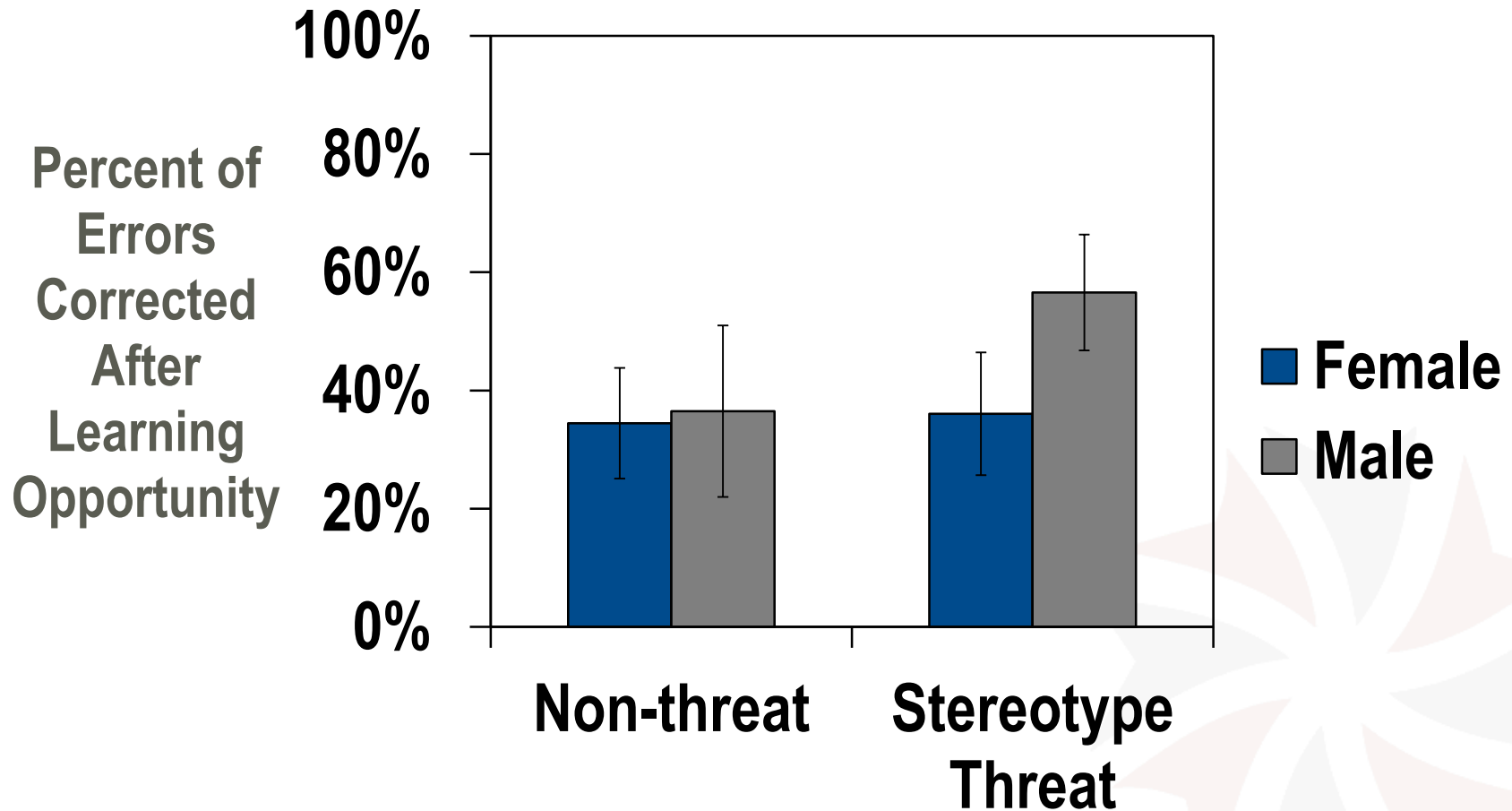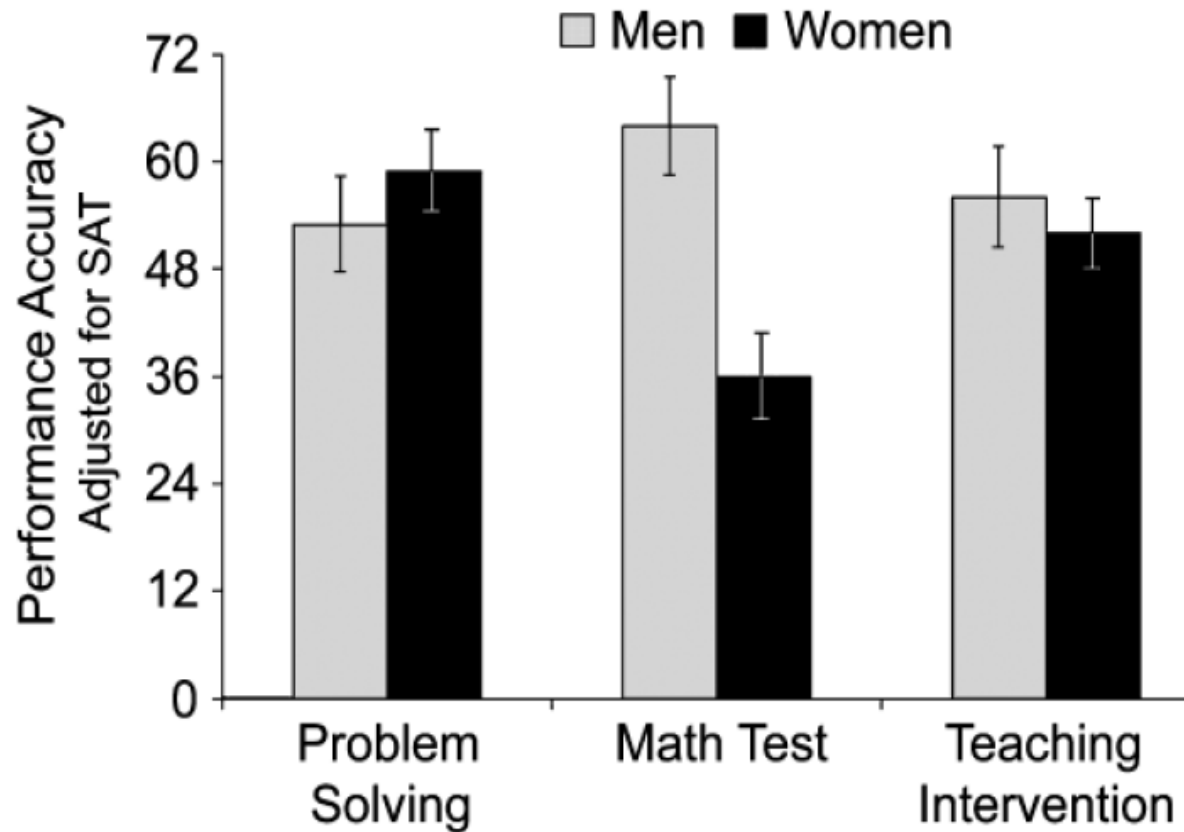
Reattribution for Difficulty

Attributing Difficulties to Non-Stable Causes

- Struggles that you experience now will get better over time.

- Students like you have struggled in similar ways in the past, but have eventually overcome those difficulties.

Good, Aronson, & Inzlicht, 2003

Attributing Difficulties to External Causes

Johns, Schmader, & Martens, 2005

Research-based Strategies for Reducing Stereotype Threat

- Encourage students and teachers to adopt a growth mindset.

- Encourage students to base their feelings of belonging on their efforts and engagement.

- Create a classroom learning environment that values effort and engagement as a path to belonging.

- Encourage students to attribute their difficulties to causes other than their own limitations.

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Discussion Questions

1. How can you create a classroom environment that fosters growth mindsets?

2. How can you create a classroom environment that creates room for many more people to feel a sense of belonging to STEM?

3. How can you help students re-attribute their difficulties to non-stable factors?

Mindsets That Reduce Stereotype Threat

Entity messages reduce *Sense of Belonging*, which negatively affects achievement and retention in the domain

- especially in the face of stereotypes.

Incremental messages help maintain high *Sense of Belonging* which positively affects achievement and interest in the domain

- even in the presence of negative stereotypes.

Mindsets that Reduce Stereotype Threat
(Continued)

Educators who emphasize effort (rather than ability) as a key determinant in students' belongingness in academics may:

- promote more learning engagement for underrepresented students
- reduce stereotype threat
- perhaps help eliminate the culture of "talent".

Over time, higher engagement could eventually lead to higher learning and achievement.

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Attributions that Reduce Stereotype Threat

Difficulties are a result of:

- test anxiety, or
- the stereotype threat process

Everyone struggles at some point and most eventually overcome their difficulties

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Thank You

Katharine Atterbury   Ayesha Ferdouse

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Laura Deering   Jennifer Mangels

Carol Dweck   Aneeta Rattan

Andrew Evelo   Ramyaa Ravichandra

www.ReducingStereotypeThreat.org

Next Steps

- ✓ Download the PDF presentation

- ✓ Review Dr. Good's prior NAPE webinar

- ✓ Look for updates: Reducing Stereotype Threat

- ✓ Go to the EIT website: www.WSKC.org/EIT

  - Sign up to participate in future live webinars

    - Register: Active Learning—'Live and Online' (April 9, 2015)

    - Drs. Richard Felder & Rebecca Brent—Master Educators

  - Listen to previously recorded webinars

  - Use the *Action Checklists* & Other Resources

  - Apply for the *Inclusive Educator Award*! (May 1st deadline)

- ✓ Share this information with colleagues!

- ✓ Provide us feedback!

  - Receive personalized "Certificate of Participation" upon completion!
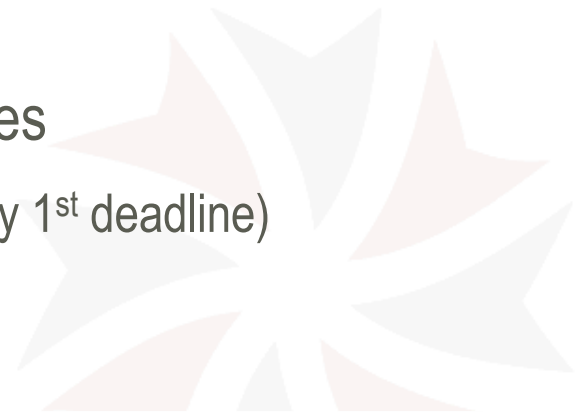
Personalized "To Do"

Based on what you have learned, what are YOUR next steps to creating an inclusive learning context for your students?

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Together we can engage all minds in engineering the future!

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