

# Mentoring Without Borders: Using the Science of Mentorship

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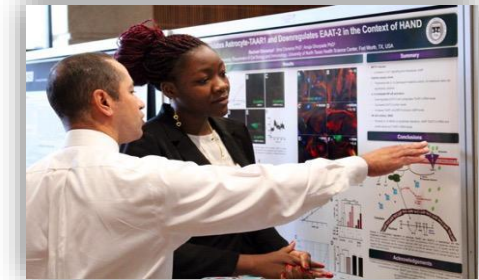


2021 CHADD MENTORING COURSE

**MENTORING WITHOUT BORDERS**

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FRIDAY, NOVEMBER 5, 2021  
1:00 TO 6:00PM  
VIRTUAL EVENT



# Overview: Four Key Points

1. Core Findings Cited in the National Academies Report on “The Science of Effective Mentorship In STEMM”
1. National Models for Mentorship Education
1. Mentorship in the Current Context
1. Mentorship as Environmental Stewardship

# POLL

How impactful have your mentoring relationships been up to this point in your career?

1. Extremely important
2. Very important
3. Moderately important
4. Not very important
5. Not at all important

# Why Mentorship Matters?

- Graduate students are **more likely to persist** in their academic decisions if engaged in positive mentoring experiences (McGee and Keller, 2007; Williams et al., 2016)
- Graduate students cite positive mentoring experiences as the **most important factor in completing a STEM degree** (Ashtiani and Feliciano, 2012; Solorzano, 2000)
- Women and underrepresented students are **better integrated into the STEM academic community** if engaged in positive mentoring experiences (Anderson and Kim, 2006; Byars-Winston et al., 2015; Estrada et al., 2018; Felder, 2010; Good et al., 2000; Griffith, 2010; Huang et al., 2000; Lewis et al., 2016; Lisberg and Woods, 2018)
- Positive mentoring experiences **increase recruitment** of underrepresented mentees into graduate school and research-related career paths (Hathaway et al., 2002; Junge et al., 2010; Nagda et al., 1998; Thiry and Laursen, 2011).
- A focus on psychosocial needs is associated with increases in how mentees perceive the quality of the mentoring relationship and how satisfied they are with that relationship, which in turn **enables them to see themselves as more competent** as STEM researchers (Tenenbaum et al., 2001; Waldeck et al., 1997).
- Mentored graduate students and medical trainees are **more likely to publish** their research than those who are not mentored (Steiner et al., 2004; Steiner et al., 2002; Wingard et al., 2004)

# This We Know About Trainees

- Trainees have **unequal access** to mentoring and quality mentoring varies by groups.
- Scholars from underrepresented groups typically receive less mentoring than their peers from overrepresented groups (Thomas et al., 2001; Helm et al., 2000; Morzinski et al., 2002).
- White investigators are significantly more likely than Black and Hispanic investigators to win R01 awards; minority investigators indicate that **inadequate mentoring posed obstacles to obtaining funding** (Ginther et al., 2011).

# This We Know About Mentors

- Many have not received mentor training (Pfund et al., 2006).
- Many do not believe socioemotional, instrumental functions are part of their mentorship role (Laursen et al. 2010).
- Many do not know of or believe the realities that their trainees may experience, especially those from underrepresented groups in STEM (Alexander & Hermann, 2016).
- Many adopt a general colorblind ideology (Prunuske et al., 2014).
- Most did not pursue an academic career to be change agents (Byars-Winston, *in review*).

# A National Focus on Mentorship



## National Science Foundation (NSF)

- ▶ Postdoctoral mentoring plans
- ▶ Undergraduate research AND mentoring programs



## Sloan Foundation

- ▶ University Centers for Exemplary Mentoring

HHMI

## Howard Hughes Medical Institute

- ▶ Mentorship Education for Gilliam Scholar Programs



## National Institutes of Health (NIH)

- ▶ Mentored K awards and New NIGMS T32 requirement
- ▶ Individual development plans (IDPs)
- ▶ National Research Mentoring Network (NRMN)
- ▶ MOSAIC

## National Academies of Science

- ▶ Report on Mentored Undergraduate Research Experiences (2016)
- ▶ Report on Graduate STEM Education (2018)
- ▶ **Report on the Science of Effective Mentorship In STEMM (2019)**

*The National Academies of*  
SCIENCES • ENGINEERING • MEDICINE

# The Science of **Effective Mentorship** in STEMM



#NASEMmentoring



# THE SCIENCE OF EFFECTIVE MENTORSHIP IN STEMM

## ONLINE GUIDE V1.0



Overview ▾

Mentorship Defined ▾

Program Development and Management ▾

Actions and Tools ▾

Rationale

Why Mentorship Matters

About the Report

Recommendations

Mentorship Functions

Forms of Mentorship

Mentorship, Identity, and  
STEMM

Culturally Responsive  
Mentorship

Negative Mentoring  
Experiences

Mentorship Education

Matching Mentors and  
Mentees

Program Assessment

Developing a Culture of  
Mentorship

Mentoring Tools

References

✉ Comments or Suggestions?

📄 [www.nap.edu/mentoring](http://www.nap.edu/mentoring)

# What is Mentorship?

*Mentorship is a professional, working alliance in which individuals work together over time to support the personal and professional growth, development, and success of the relational partners through the provision of career and psychosocial support.*

Mentorship includes **career support functions** (e.g., career guidance, skill development, sponsorship) and **psychosocial support functions** (e.g., emotional support or role modeling) aimed at mentee talent development.

# What is Mentorship? Elements

## Trust

Trust develops when mentors and mentees work together to identify and respond to their mutual goals, needs, and priorities. These change over time and thus may require adjustment.

## Self-reflection

Critical and honest self-reflection occurs at multiple stages of effective mentorship processes.

## Expectations

Explicit declarations of the expectations of both mentors and mentees at the initiation of mentorship—revisited periodically and possibly recorded in writing—can help create an effective mentoring relationship.

## Education

Mentorship is a learned skill, and mentorship education influences mentor and mentee attitudes, self-efficacy, and behaviors.

# POLL

In general, how well do you think your mentoring relationship(s) are going?

1. Extremely well, nothing needs to be changed
2. Very well, but could benefit from some optimization
3. Moderately well, could use some work
4. Not very satisfied, really needs some work
5. Not well, needs major work
6. Prefer not to respond

# How can we Create a Culture of Effective Mentorship?

## Recommendation 2:

### Use an Evidenced-Based Approach to Support Mentorship

Program leaders should support mentorship by ensuring there are evidence-based guidelines, tools, and processes for mentors and mentees to set clear expectations, engage in regular assessments, and participate in mentorship education.

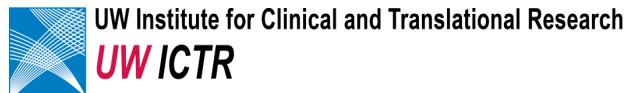
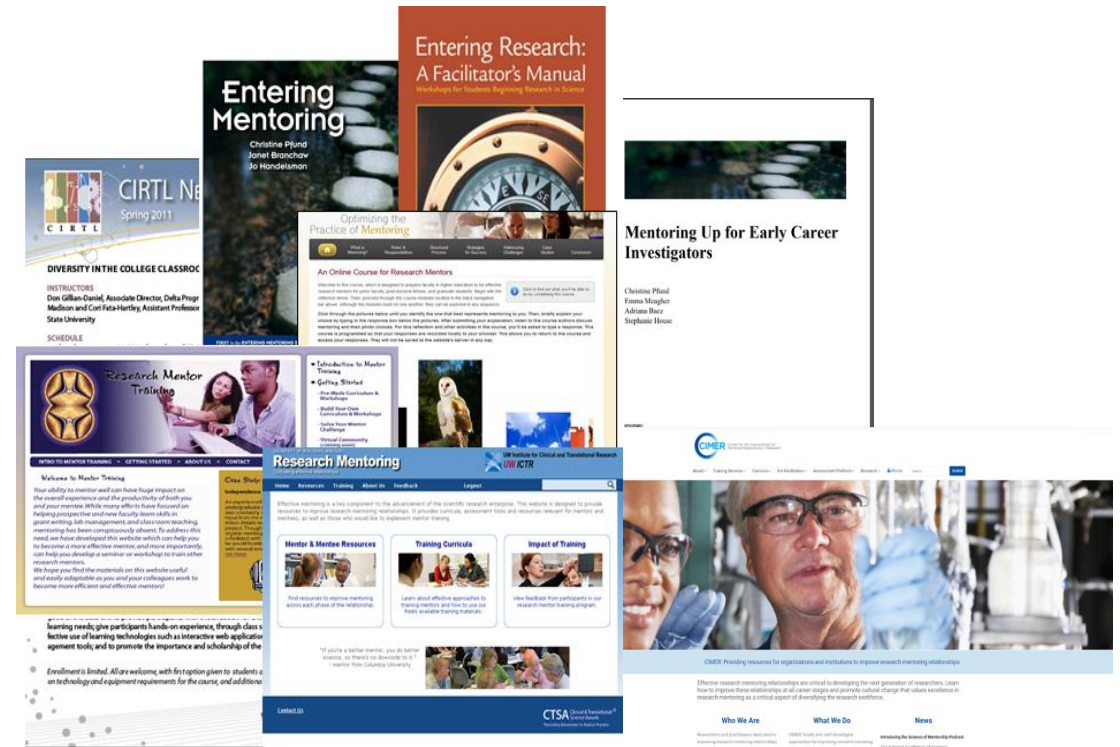
# POLL

Have you had an opportunity to engage in mentorship education (e.g. mentor training)?

1. Yes
2. No
3. I don't recall

# CIMER Serves as a National Training Hub for Mentorship Education

- Face-to-face mentor training workshops
- Face-to-face mentee training workshops
- Self-paced online training
- Synchronous online training
- Train-the-trainer workshops
- Implementation workshops



# Key Elements of Our Approach

- Process-based using case studies and group problem solving
- Aimed at awareness-raising and reflection
- Provides a confidential and brave forum to share the collective experience of mentors across a range of experiences
- Links to relevant resources to advance mentorship



# Standardized Learning Objectives and Competencies Such As...

Aligning expectations

Promoting professional development

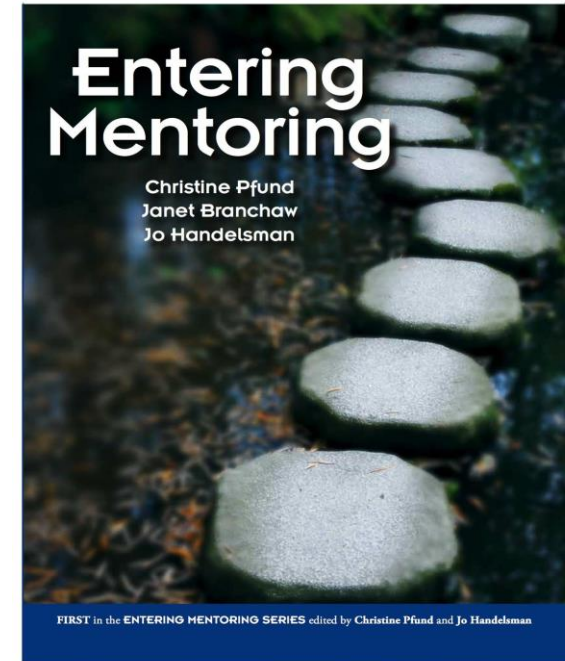
Maintaining effective communication

Addressing equity and inclusion

Assessing understanding

Fostering independence

And more in development!



# Case Scenario: The Slow Writer

A third year graduate student in my group is adept at performing experiments and analyzing data, but is a very slow writer. Last fall, I set multiple deadlines that this graduate student missed, while another student in my group wrote an entire thesis chapter, submitted a paper, and did experiments. Over winter break, the slow writer had a breakthrough and produced a fairly reasonable draft of a prelim proposal. However, because she produced it so close to the (planned) prelim date and did not have the presentation ready either, I delayed the exam. To avoid delays in publications, I have taken the lead in writing manuscripts based on her work. However, to graduate with a PhD, I realize that she must write the dissertation, as well as the next manuscripts, herself. What should I do?

# POLL

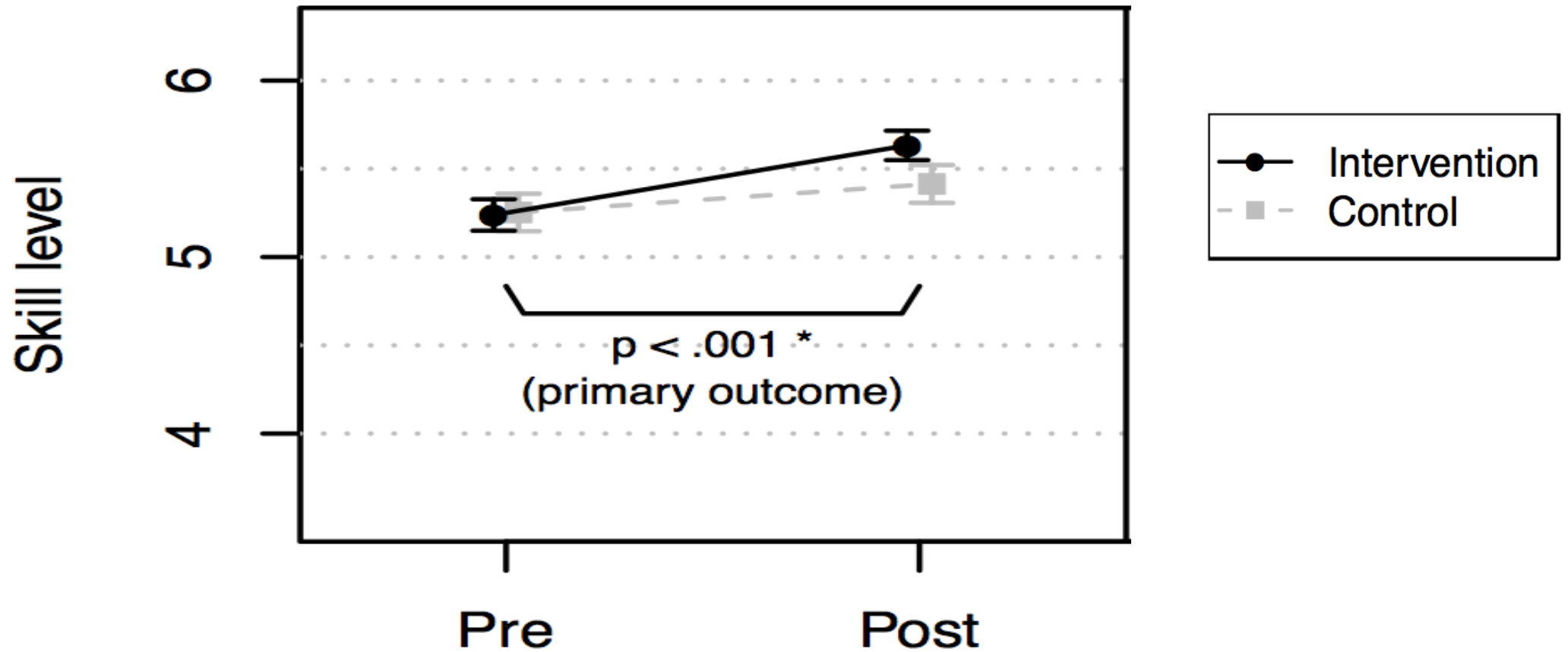
What is your reaction to this case study?

1. I have encountered this mentoring challenge and successfully navigated it
2. I have encountered this mentoring challenge and wish I could have navigated it more effectively
3. I have encountered this mentoring challenge and still am uncertain how to approach it
4. I have not encountered this mentoring challenge yet
5. I am living this challenge right now and could really use some advice

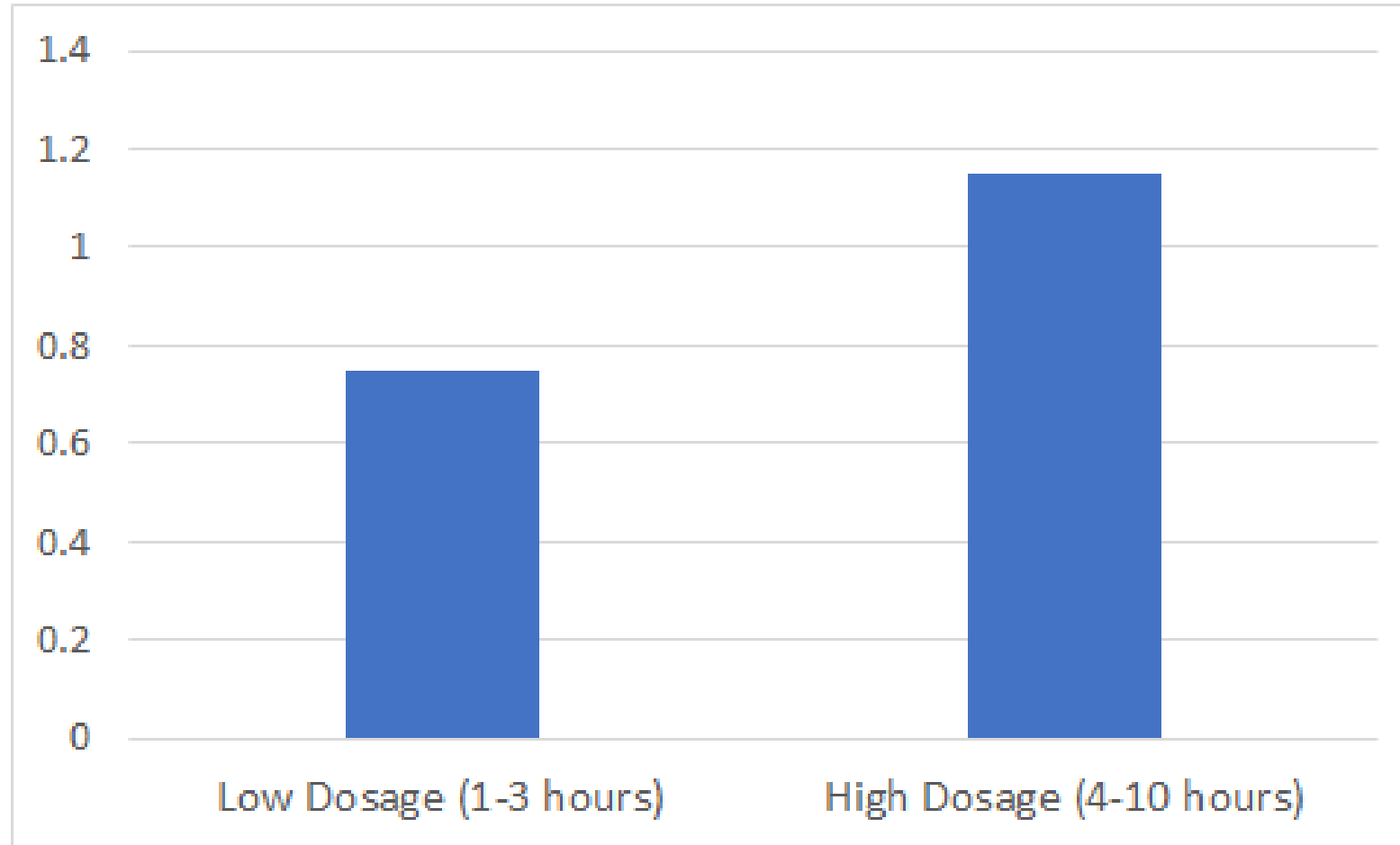
# Case Study Discussion Follow-Up

- Increased awareness from discussion
- Enhanced list of strategies
- Resources such as:
  - Reading on providing feedback
  - Tools for aligning expectations
  - Tools for enhancing communication across diversity

# Significant Change in Mentor Self-Reported Mentor Competency Assessment



# Increased Dosage of Mentor Training Results in Higher Gains in the Quality of Mentoring One Feels They are able to Provide (n=410)



# Efficacy of Synchronous Online Implementation

- Used propensity score matching to examine the difference in research mentor training outcomes face-to-face (n=655) or online (n=172)
- **Mode of training does not make a significant difference** on 3 mentoring assessments including the mentoring competency assessment (MCA)

## Training Curricula

Please visit the CIMER website for more information about [Entering Mentoring](#), [Entering Research](#), or [Mentoring Up](#).

### Entering Mentoring

The Entering Mentoring curricula is designed for those who wish to implement process based, professional development workshops for research mentors. You may choose one of our complete, pre-assembled packages or build your own customized curriculum.



Complete  
Curricula



Custom  
Curricula

### Entering Research

The Entering Research curricula is designed for those who wish to implement process-based, professional development workshops, courses, or programs for undergraduate and graduate research trainees. You may choose one of our complete, pre-assembled packages or build your own customized curriculum.



Complete  
Curricula



Custom  
Curricula

### Mentoring Up

The Mentoring Up curricula is designed for those who wish to implement process-based, professional development workshops for postdoctoral trainees and junior faculty.



Complete  
Curricula





# Training Materials: Mentee Training Curricula

## Complete Entering Research Curricula

Curricula are organized by implementation type. Each curriculum denotes the career stage of the trainee. Click on the magnifying glass icon and download the curriculum as a PDF.



### 10 Week Summer Research Program for Undergraduate Students

- ✓ Research Comprehension & Communication Skills
- ✓ Practical Research Skills
- ✓ Research Ethics
- ✓ Researcher Identity
- ✓ Researcher Confidence & Independence
- ✓ Equity & Inclusion Awareness & Skills
- ✓ Professional & Career Development Skills

 Preview



### 15 Week Course for Novice Undergraduate Students

- ✓ Research Comprehension & Communication Skills
- ✓ Practical Research Skills
- ✓ Research Ethics
- ✓ Researcher Identity
- ✓ Researcher Confidence & Independence
- ✓ Equity & Inclusion Awareness & Skills
- ✓ Professional & Career Development Skills

 Preview



### 15 Week Seminar for Intermediate Undergraduate Students

- ✓ Research Comprehension & Communication Skills
- ✓ Practical Research Skills
- ✓ Research Ethics
- ✓ Researcher Identity
- ✓ Researcher Confidence & Independence
- ✓ Equity & Inclusion Awareness & Skills
- ✓ Professional & Career Development Skills

 Preview



### 15 Week Seminar for Novice Graduate Students

- ✓ Research Comprehension & Communication Skills
- ✓ Practical Research Skills
- ✓ Research Ethics
- ✓ Researcher Identity
- ✓ Researcher Confidence & Independence
- ✓ Equity & Inclusion Awareness & Skills
- ✓ Professional & Career Development Skills

 Preview

# How do Identities Affect Mentorship in STEMM?

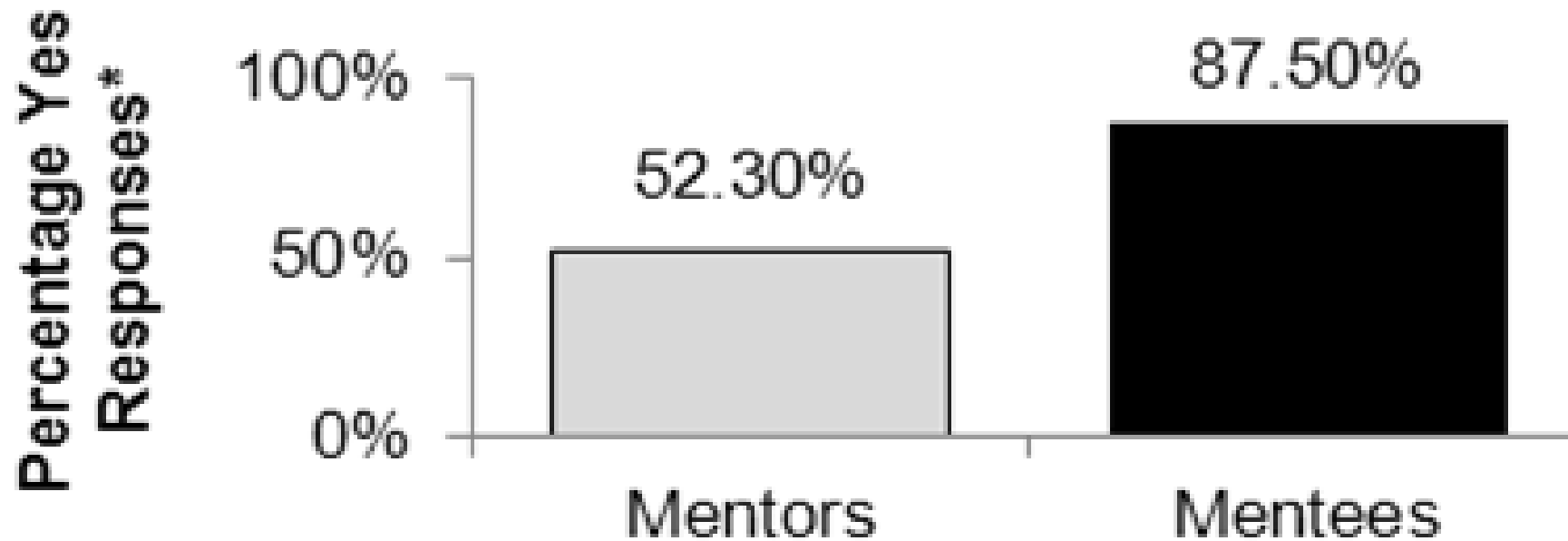
**Cultural identities and science identity** matter for:

- academic and career development
- the experience of STEMM mentoring relationships

**Culturally responsive mentoring:**

- is a learned skill set in which mentors, regardless of their race or gender, show interest in and value students' cultural backgrounds and social identities
- can increase students' satisfaction w/ mentoring and commitment to STEMM career goals

# Mentee - Mentor Mismatch



**Should you address cultural diversity directly in the mentoring relationship?**

# Qualitative Findings

**Cultural diversity often viewed as interference variable**

*“I don’t care where you’re from...it’s science” [mentor]*

**For mentors who experienced culture and science as related, they focused on their mentees’ culture, not their own**

*“I do think people come in with different perspectives and those perspectives alter how they view research and how they view the lab environment” [mentor]*

**Mentors and mentees disagree on whose role it should be and when to address diversity**

*“If where they’re from and how they’re communicating is important to the discussion then they should feel empowered enough to bring it up.” [mentor]*

**Both mentors and mentees noted that addressing cultural diversity is complex, for which few feel equipped to handle**

# Culturally Aware Mentorship Training



Part 1:  
Intrapersonal



Part 2:  
Interpersonal

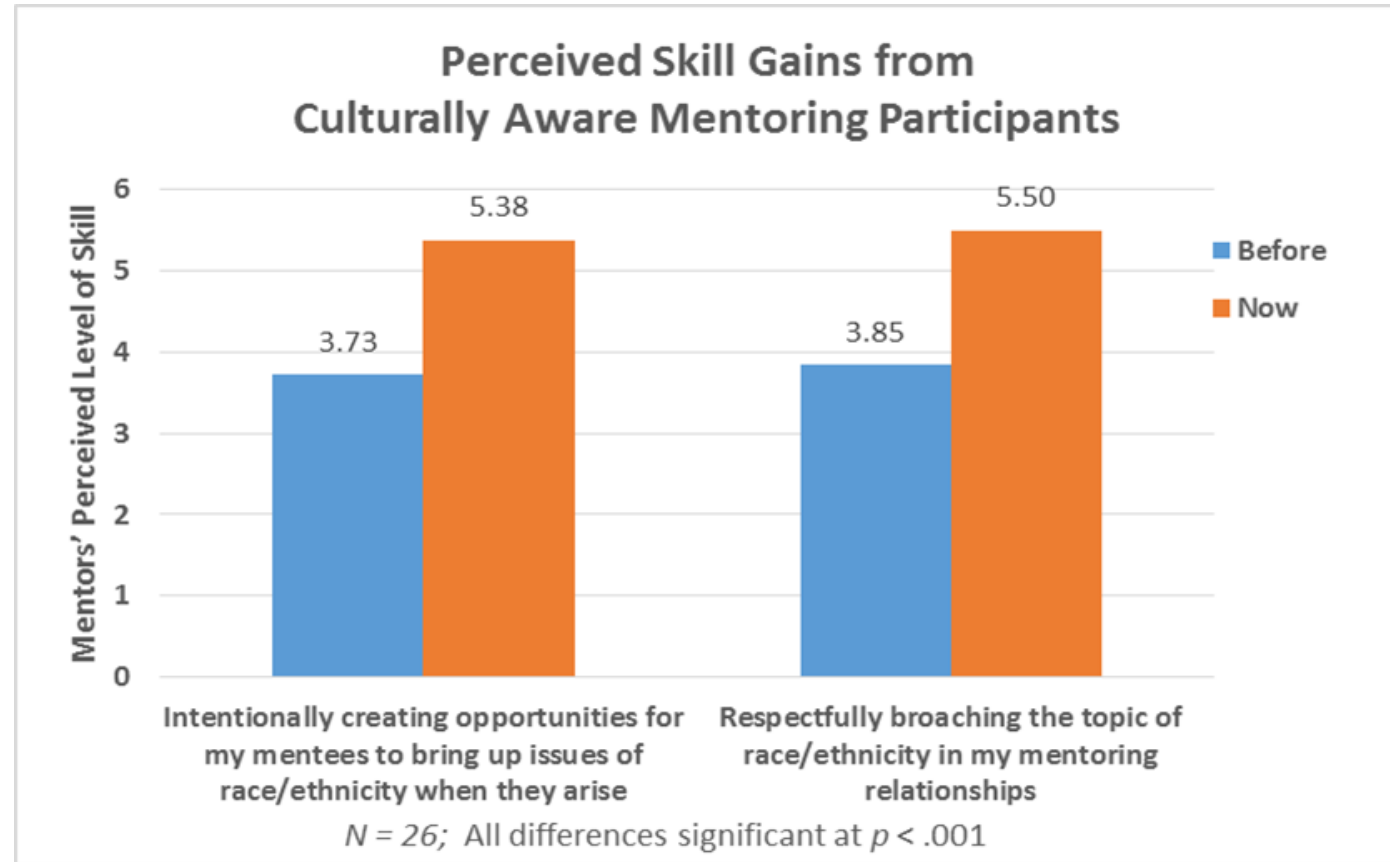


Part 3:  
Skill Building



# Culturally Aware Mentor Training

- Full-day level 2 mentor training workshop
- Implemented at 12 sites with 257 participants
- Pilot data (n=70) show self-reported significant gains
- Sample of Impact 24 months Post Pilot Training
  - Greater realization of their own racial and ethnic biases and insensitivities
  - More individualized mentoring strategies
  - Better engagement with historically underrepresented (HU) students, even by HU faculty



Byars-Winston et al. 2018. *Journal of Clinical and Translational Science*, 2(2), 86-94.

Womack VY, Wood CV, House SC, Quinn SC, Thomas SB, McGee R, Byars-Winston A.. PLoS One. 2020 Aug 7;15(8):e0236983. doi:

Impact of Culturally Aware Mentoring Interventions on Research Mentors and Graduate Training Programs NIH Grant #U01 GM132372

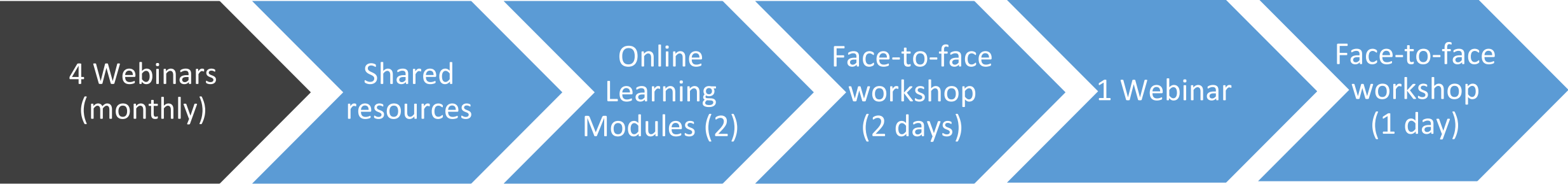
# HHMI Gilliam Mentorship Skills Development Training



**Working with faculty to create inclusive environments in science.**



# One Year Program for Mentors (25-30 hours)



# Mentorship in the Current Context

Acknowledge  
the context  
of disruption.



Living in a  
State of  
Transition

<https://www.online-therapy.com/blog/deal-life-transitions/>

Gotian, R. and Pfund, C. 2021 . Six mentoring tips as we enter year two of COVID. *Nature Career Column*

# POLL

My stress level coming into this month is:

1. Normal (able to carry out everyday tasks)
2. Mild (unable to work at maximum efficiency for long periods of time)
3. Moderate (difficulty sleeping, not up to socializing)
4. Severe (unable to balance multiple parts of my life insomnia, anger/panic)
5. Unsure
6. Prefer not to share

# Doing Our Best in Our Relationships But...



In times of stress and trauma, the brain has a harder time facilitating empathy and becomes more egocentric

Study- During periods of moderate stress, performance decreased the ability to:

- Recognize subject's own or other's emotions (emotional condition)
- Make a judgement taking on another person's perspective (cognitive condition)

# Focus on What Matters Most: The well-being and humanity of mentees and mentors

1. Make time during regular meetings for a personal check-in

1. **Invite** each other to share

1. Ask, don't assume

1. Listen, don't fix

1. Put yourself in their shoes

1. Slow down

1. Take care of yourself



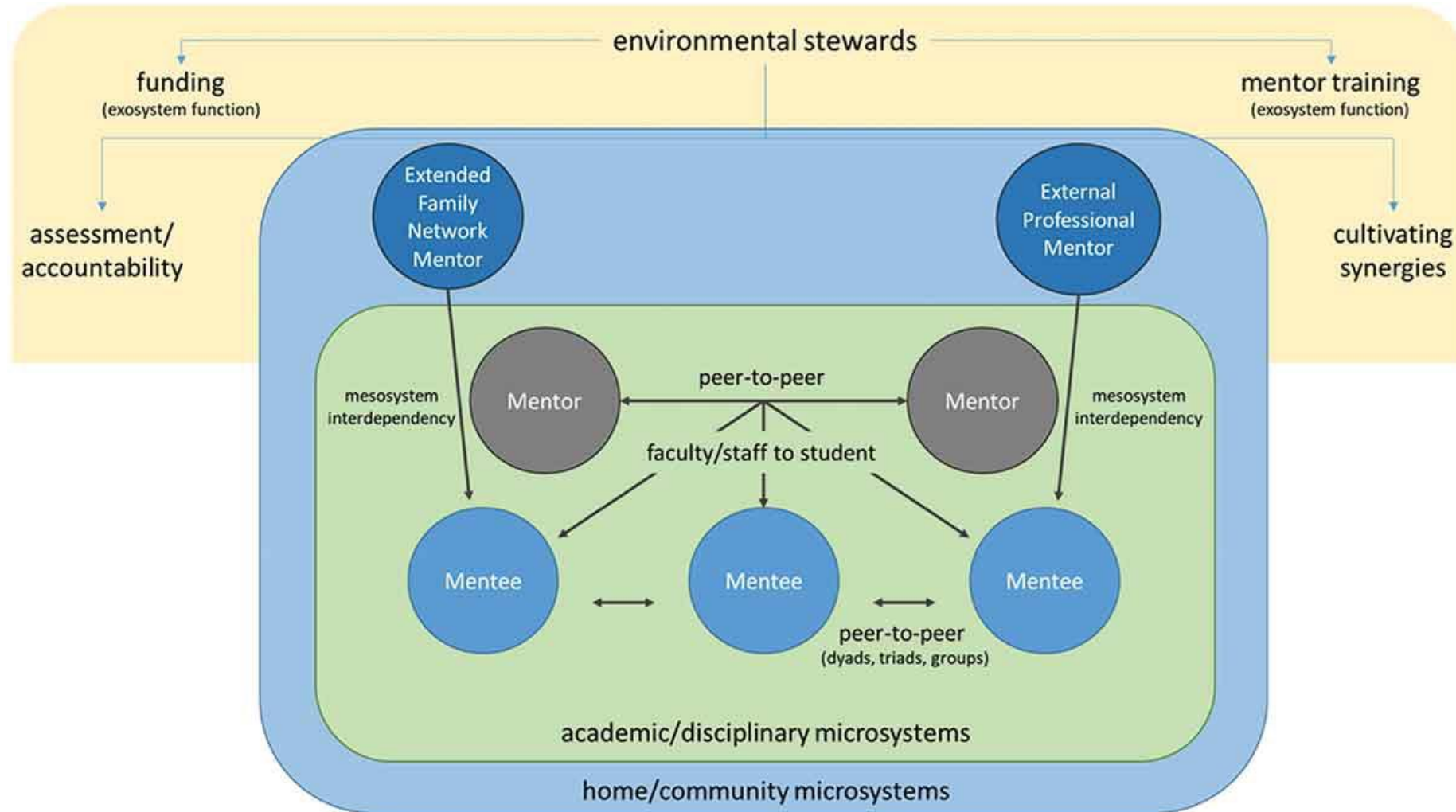
# Mentoring as Environmental Stewardship

“...when mentoring, goal attainment, and advancement occur as an ecosystem, then effective and progressive mentoring is not about helping those mentored “adapt to toxic water and polluted air”, but to “help them purify the water and clear the air” according to Weiston-Serdan’s (2017) concept of critical mentoring.

Impactful and effective mentoring is then centered in a learning environment or context of **tending an ecosystem** in support of an individual pursuing specific goals therein (Montgomery 2018c).

The beauty of this approach is that the environment better serves the particular individual, while ultimately being changed into a better state to support others as well. This is mentoring as transformation. This is mentoring as progressive environmental stewardship.”

# Mentoring as Environmental Stewardship

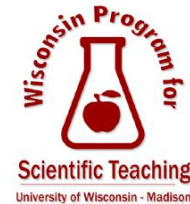


Mondisa, Joi-Lynn, Becky Wai-Ling Packard, and Beronda L. Montgomery. "Understanding what STEM mentoring ecosystems need to thrive: A STEM-ME framework." *Mentoring & Tutoring: Partnership in Learning* 29.1 (2021): 110-135.

# Acknowledgements



UNIVERSITY OF WISCONSIN  
**Center for Women's  
Health Research**







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