Questions of Belonging: Their Implications for Performance, Merit, and Intervention

Greg Walton
Stanford University
Some worries people have in school and at work

Do I belong? When I feel lonely (or disrespected, etc.), does it mean I don’t belong?

Does it matter? When it’s boring or frustrating, does it mean there’s no reason to try?

Can I do it? When it’s hard or I fail, does it mean I can’t do it?
Socio-Cultural Contexts Give Rise To Specific Questions

Including perspectives and risks or contingencies rooted in personal and social identity
School Desegregation, and Resegregation
Can people like me belong and succeed here?

People look to **cues in contexts** to answer these questions
Part 1

Understanding Cues
“I Count”
“Like many other Blacks, when I find myself in a new public situation, I will count.”

-Arthur Ashe
The “Wall of Fame” in the main conference room at a Major Professional Organization in San Francisco
Summer Conference Video

Balanced Video (1:1)

Unbalanced Video (3:1)

• 2 (participants gender) X 2 (video) factorial

Unbalanced Video = cue of identity threat for women
Vigilance: Recognition Memory for Conference Video

Number correct: 15 total items

Unbalanced Video

Balanced Video

Mary Murphy
Indiana
Cardiovascular Reactivity

Z-Score Composite

Unbalanced Video

Balanced Video

Mary Murphy
Indiana

Men

Women
Sense of Belonging

0-15 Scale

10.00
11.00
12.00
13.00
14.00
15.00

Unbalanced Video
Balanced Video

Men
Women

Mary Murphy
Indiana
“I Count”
What’s on the Wall
What’s on the Wall?

**Stereotypical Room**
- Star Trek poster
- Sci Fi books
- Coke cans

**Non-Stereotypical Room**
- Nature poster
- Neutral books
- Water bottles

Sapna Cheryan
U-Washington
Interest in Computer Science
(Cheryan et al., 2009)
“I Count”
What’s on the Wall
Interactions and Beliefs
Are you flirting with me?
(Logel, Walton, Spencer, Iserman, Von Hippel, & Bell, 2009)

• Male and female engineering students discussed an engineering news story
• Previously completed a subtle measure of sexism
• Took a math test
Men’s Sexism and Women’s Math Performance

- More sexist men
- More open posture
- Sat closer
- Looked at woman’s body more
- Rated more dominant and confident

![Graph showing Women's Math Performance against Lower and Higher Levels of Sexism. The x-axis represents Lower Levels of Sexism to Higher Levels of Sexism. The y-axis represents Women's Own Level of Sexism in red and Male Partner's Level of Sexism in green. The graph indicates a negative correlation between sexism and math performance.]

Christine Logel
University of Waterloo
Men’s Sexist Behavior Causes Women’s Performance to Drop

- Interaction partner trained to behave like NON-SEXIST man
- Interaction partner trained to behave like SEXIST man

Christine Logel
University of Waterloo
Male and female professional engineers completed daily surveys.

Social Identity Threat

*Today at work…*

– I felt very aware of my gender.
– I was concerned that, because of my gender, my actions influenced the way other people interacted with me.

Results

– Women experienced more identity threat than men
– Especially on days when they had negative conversations with men
– Predicted greater levels of daily burnout
Can I Contribute Here?  
(Muragishi & Walton, in prep)

- 897 employees of a large Silicon Valley tech company
- Report on belonging at company
- And in response to three work scenarios:

**Neutral Scenario**

*Imagine that you joined a new team. It’s a small team. The team uses some programs you know, and another that is pretty idiosyncratic. There is a team manager and several other members of the team.*
Can I Contribute Here?
(Muragishi & Walton, in prep)

**Negative Scenario**

…You’re working on a particular technical problem that needs to be solved with your manager, Evan. You feel good about an approach to the problem you’ve been looking into. You know it’s promising. You start describing the approach to Evan, *but he interrupts you*. Later, Evan mentions an approach a lot like what you had in mind. He figures out how to use it effectively and decides to pursue the approach.
Can I Contribute Here?  
(Muragishi & Walton, in prep)

Positive Scenario

...You start describing the approach to Evan. He listens carefully and asks you follow-up questions to learn more. You bounce ideas off each other and talk through how to use the approach for this specific problem. Together you figure out how to use it effectively.
Can I Contribute Here?
(Muragishi & Walton, in prep)

Belonging

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Company</td>
<td>5.22</td>
<td>4.98</td>
</tr>
<tr>
<td>Neutral Scenario</td>
<td>4.91</td>
<td>4.57</td>
</tr>
<tr>
<td>Negative Scenario</td>
<td>2.39</td>
<td>1.89</td>
</tr>
<tr>
<td>Positive Scenario</td>
<td>6.10</td>
<td></td>
</tr>
</tbody>
</table>

$d$ values:
- $d=0.21, p=0.003$
- $d=0.33, p<0.001$
- $d=0.45, p<0.001$
- $d=-0.16, p=0.05$
Does it take a genius?
(Leslie, Cimpian, Meyer, & Freeland, 2015, Science)

- Faculty, post-docs, and grad students surveyed (N=1820)
  
  - “Being a top scholar of [discipline] requires a special aptitude that just can’t be taught.
Perceptions of Stereotyping in Math
(Good, Rattan, & Dweck, 2012)

Perceptions of stereotyping
E.g., People in my calculus class believe that females are [not] as good as males as calculus

Perceptions of environmental entity theory
E.g., People in my calculus class believe that people have a certain amount of math intelligence and they can’t really do much to change it.

Low Sense of Belonging in Math

Low Intention to Pursue Math in the Future
Do professors think intelligence can grow? (Canning, Muenks, Greene, & Murphy, 2019, *Science Advances*)

- STEM faculty surveyed ($N=150$)
  - “To be honest, students have a certain amount of intelligence and they really can’t do much to change it.”

- Linked to university grade records and courses evaluations
Do professors think intelligence can grow?

(Canning, Muenks, Greene, & Murphy, 2019, *Science Advances*)
Remedy #1: Attend to and Change Cues in Settings That Predictably Provoke Feeling of Non-Belonging
Remedy #1: Attend to and Change Cues in Cultures That Predictably Provoke Feeling of Non-Belonging
But Many Everyday Experiences Are Ambiguous
When I first arrived at school as a first-generation college student, I didn’t know anyone on campus except my brother. I didn’t know how to pick the right classes or find the right buildings. I didn’t even bring the right size sheets for my dorm room bed. I didn’t realize those beds were so long. So I was a little overwhelmed and a little isolated.

-Michelle Obama (2014)
Belonging Uncertainty
(Walton & Cohen, 2007)
Second-Choice Remedy

Can we construct experiences in school and work that help people answer pressing questions about belonging adaptively?
Social-Belonging: From Fixed Quality to Process

Yes/No
- Do I belong or not?
- Does this event mean I don’t belong?

Process
- It takes time and effort
- How will I develop my belonging?
The Social Belonging Intervention

Stories + “Saying-Is-Believing”
Highly Selective College
College Grade Point Average by Year*

Walton & Cohen (2011, Science)

- Reduced the Black/White achievement gap through senior year by 52%
- Improved self-reported health and well-being at the end of college

* Original trial; many subsequent replications and extensions, with diverse populations and in diverse school and work contexts (see Walton & Brady, 2020)

European Americans, Control
African Americans, Control
European Americans, Social-Belonging Treatment
African Americans, Social-Belonging Treatment

Social-Belonging Treatment (1-hour in-person exercise)
A Deleterious Interpretation of Social Adversity

Everyone is going out without me, and they didn’t consider me when making their plans. At times like this I feel like I don’t belong here and that I’m alienated.

-Black female, control condition
A Deleterious Interpretation of Social Adversity

Everyone is going out without me, and they didn’t consider me when making their plans. At times like this I feel like I don’t belong here and that I’m alienated.

**Statistical mediation:**
This change in social construal statistically mediated the 3-year gain in academic performance.
Young Adulthood  
(Brady, Cohen, Jarvis, & Walton, under review)

- Participants surveyed at about age 27  
- 7-9 years after participation, 3-5 years after college  
- 87% retention

Among African Americans:

<table>
<thead>
<tr>
<th></th>
<th>Control Condition</th>
<th>Treatment Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Satisfaction &amp; Success: <em>Self-Rated Potential To Succeed in the Future</em></td>
<td>53rd percentile</td>
<td>69th percentile</td>
</tr>
<tr>
<td>Psychological Well-Being: <em>Life Satisfaction</em></td>
<td>4.44 (7-point scale)</td>
<td>5.41</td>
</tr>
</tbody>
</table>

* Sample measures; Composite indices yield same effects
How did students get there?

• GPA?
  – No. GPA does not predict these outcomes

• Mentorship?

Among African Americans:

<table>
<thead>
<tr>
<th>Did you have an academic mentor in college?</th>
<th>Control Condition</th>
<th>Treatment Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did this mentorship continue after college?</td>
<td>43%</td>
<td>84%</td>
</tr>
</tbody>
</table>

Statistically mediates the long-term gains in life outcomes
CONTROL:  
I wouldn't say I received any mentorship at [school] - not for lack of interested professors, but I didn't really seek it.

TREATMENT:  
The first semester of my freshman year was very difficult for me. I was struggling academically, didn't feel like I fit in, and was unhappy with my major…I began to spend more time speaking with my freshman counselor. We really bonded, and she helped me to realize that I did belong at [school]. Thanks to her, I was able to connect better with my peers and perform better academically. We've kept in touch ever since.
Like clay, meanings are malleable but can become fixed especially when they get “baked into” the structure of people’s lives i.e., cultures self-reinforce
Women in Male-Dominated Engineering Fields

Christine Logel
Waterloo

Jen Peach
Waterloo

Mark Zanna
Waterloo

Steve Spencer
Ohio State
Adaptation for Women in Engineering
(Walton, Logel, Peach, Spencer, & Zanna 2015)

- Extensive focus groups and interviews to identify novel themes
<table>
<thead>
<tr>
<th>Insight</th>
<th>Example</th>
<th>Optimization (revision to intervention message)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Women felt excluded from</td>
<td>Students described feeling excluded from male groups, not feeling “one of the guys”</td>
<td>Describe feeling excluded from a male subgroup in a conversation about hockey. But when the conversation turned to a relevant engineering TV show, and realizing that “even though I don’t share their love of hockey…we do have a lot in</td>
</tr>
<tr>
<td>male peer groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Women experienced sexist</td>
<td>Students described making a “classy” women in engineering calendar, and then having a male professor make a sexist remark about and a female professor tell us “not to present [ourselves] as women first if [we] wanted to be taken seriously as engineers</td>
<td>Seed alternative attributions for what could feel like sexist disrespect. Male student describes feeling dismissed by a male professor—and seen as “dumb”—but later learns that in fact the professor just wasn’t a good teacher.</td>
</tr>
</tbody>
</table>
First-Year GPA in Engineering
(Controlling for within-major mean)

Dean’s Honour List
At Risk of Being Dismissed from Engineering

Men
Women

Randomized Control
Social-Belonging

Male Dominated Majors
(∼10% women)

Men
Women

Gender-Diverse Majors
(∼33% women)

Men
Women

74
78
65
77

p=0.023

Women’s Friendship Groups
(controlling for preintervention)

In Male-Dominated Majors

- % Female Engineers
- % Male Engineers
- % Male Non-Engineers
- % Female Non-Engineers

Intervening at Institutional Scales
Founders and Social-Belonging PIs

Christine Logel  
University of Waterloo

Mary Murphy  
Indiana University

Gregory Walton  
Stanford University

David Yeager  
University of Texas at Austin

Omid Fotuhi  
University of Pittsburgh

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Sara Woodruff  
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Gregg Muragishi
Lisel Murdock-Perriera
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Stephanie Reeves
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Dustin Thoman
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Belonging Data Analysis

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Mary Nowak
Krysti Ryan
Tsotso Ablorh (emeritus)
Ali Blodorn (emeritus)
Peter Fisher (emeritus)
Natasha Krol (emeritus)
Alice Li (emeritus)
The CTC Belonging Trial

College and University Partners

Reasonably generalizes to 907 4-year non-profit degree-granting colleges and universities in the United States (b index=0.80)

Funding Partners

Technical Support
Facilitating Belonging in Large Introductory STEM Classes

- Kevin Binning (Psychology)
- Chandralekha Singh (Physics)
- Emily Marshman (Physics)
- Yasemin Kalender (Physics)
- Omid Fotuhi (LRDC)

- Nancy Kaufman (Biology)
- Erica McGreevy (Biology)
- Susie Chen (Psychology)
- Lisa Limeri (Biology)
- Laura Betancur (Psychology)
Classroom Based Belonging Intervention

Classroom-level random assignment

Experimental classrooms undergo intervention

Introduction: “It can be easy to feel overwhelmed or to sometimes wonder to yourself 'do I really belong here?'”

Independent reflective writing activity.

Students listen to quotes from graduating seniors designed to highlight overcoming challenges and initial loneliness.

Discuss essay and quotes with teammates.

Recitation-wide discussion and sharing by undergraduate teaching assistants and students

Control classrooms do business as usual group activities

Physics: Historic Gender Gap

Biology: Historic Race Gap
All analyses control for participant demographics (race, gender, instructor, SAT math, SAT verbal, and HS GPA)
What does inclusion require?

1. Anticipate and remedy toxic cues in settings that signal a narrow or exclusive representation of who belongs.

2. Help people make sense of everyday challenges in adaptive ways that support their belonging.

3. Ensure that those adaptive views are legitimate: The context must afford belonging to diverse people.
How should we think about “merit”?
Race and the Schooling of Black Americans

More than half of black college students fail to complete their degree work—for reasons that have little to do with innate ability or environmental conditioning. The problem, a social psychologist argues, is that they are undervalued, in ways that are sometimes subtle and sometimes not.

CLAUDE M. STEELE
APRIL 1992 ISSUE

My former university offered minority students a faculty mentor to help shepherd them into college life. As soon as I learned of the program, I volunteered to be a mentor, but by then the school year was nearly over. Undaunted, the program’s eager staff matched me with a student on their waiting list—an appealing nineteen-year-old black woman from Detroit, the same age as my daughter. We met finally in a campus lunch spot just about two weeks before the close of her freshman year. I realized quickly that I was too late. I have heard that the best way to diagnose someone’s depression is to note how depressed you feel when you leave the person. When our lunch was over, I felt as gray as the snowbanks that often lined the path back to my office. My lunchtime companion was a statistic brought to life, a living example of one of the most disturbing facts of racial life in America today: the failure of so many black Americans to thrive in school. Before I could lift a hand to help this student, she had decided to do what 70 percent of all black Americans at four-year colleges do at some point in their academic careers—drop out.
Effect of Test Description

Average Items Solved

Diagnostic ("threat")
Non-Diagnostic ("safe")

Black Students
White Students

Steele & Aronson, 1995
An Implication of Identity Threat:
(Walton & Spencer, 2009)

- Latent Ability
  - Typical measures of merit (e.g., grades, test scores) underestimate the true ability of people from negatively stereotyped groups
Meta-Analysis 1: Stereotype Threat Experiments  
(Walton & Spencer, 2009)

- 3,180 participants in 39 experiments
  - Stereotyped students (e.g., various ethnic minorities, girls, women)
  - Non-stereotyped students (e.g., Whites, men)
- Diverse populations
  - Reside in 5 countries (Canada, France, Germany, Sweden, US)
  - Elementary school students to college students
- Two experimental conditions
  - Stereotype Threat Condition (“threat” condition)
  - No Stereotype Threat Condition (“safe” condition)
- Outcome: Performance on an intellectual test
- Assess performance on a prior measure of academic achievement (e.g., college students’ SAT scores)
Meta-Analysis 1: Stereotype Threat Laboratory Experiments
(3,180 participants in 39 experiments; Walton & Spencer, 2009 *Psychological Science*)

- Stereotyped Students, Safe Conditions
- Non-Stereotyped Students, Safe Conditions
- Stereotyped Students, Threat Conditions

Intellectual Test Performance (Standard Units)

Low Prior Performance (-1 SD) — Medium Prior Performance (0 SD) — High Prior Performance (+1 SD)
Meta-Analysis 1: Stereotype Threat Laboratory Experiments
(3,180 participants in 39 experiments; Walton & Spencer, 2009 Psychological Science)

Intellectual Test Performance (Standard Units)

-0.90 -0.70 -0.50 -0.30 -0.10 0.10 0.30 0.50 0.70

- S- Stereotyped Students, Safe Conditions
- Non-Stereotyped Students, Safe Conditions
- Stereotyped Students, Threat Conditions

Low Prior Performance (-1 SD) | Medium Prior Performance (0 SD) | High Prior Performance (+1 SD)

Under-Performance
Meta-Analysis 1: Stereotype Threat Laboratory Experiments

(3,180 participants in 39 experiments; Walton & Spencer, 2009 *Psychological Science*)

Meta-Analysis 2: Intervention Field Experiments

(k=3; N=15,796 students): Nearly identical results
Implications for Understanding Group Differences

- Negatively stereotyped students have enormous, unrealized academic potential
- This potential is hidden by bias in common academic environments
- How large is the bias?
  - The effect sizes obtained ($0.17 \leq d \leq 0.18$) *almost certainly underestimate* the true effect
How large is the bias?
(Walton, Spencer, & Erman, 2013)

SAT-Math:
600 = ~620-630

SAT:
1800 = ~1850-1890
What should we do about it?

- If you treat biased measures as valid, you leave talent on the table!

- Affirmative meritocracy  (Erman & Walton, 2015; Walton, Spencer, & Erman, 2013)

- Taking this bias into account can promote meritocracy and diversity at once
Cultures have many mechanisms for reproducing themselves.

We need smart and intentional efforts to interrupt problematic cycles.
Thank you