Mindsets and Stereotype Threat

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Overarching Question

How can we help students engage and maintain motivation in the face of threat, anxiety or in low motivation situations?
Three Pillars of Achievement

- Intelligence
- Motivation
- Intellectual Curiosity
- Each is fragile; suffers in stressful situations

“Human intelligence is among the most fragile things in nature. It doesn’t take much to distract it, suppress it, or even annihilate it.”

--Neil Postman
“It is little short of a miracle that modern methods of instruction have not already completely strangled the holy curiosity of inquiry....

--Albert Einstein

“People are naturally curious, but curiosity is very fragile.”

--Daniel Willingham

Identity Threat
(Steele & Aronson, 1995)
Definition

Potentially disruptive mindset in which one worries one’s performance will confirm a negative stereotype or personal reputation as true or as self-characteristic.
Laboratory Experiment on Identity Threat

Steele & Aronson (1995)

Method: Inducing the Relevance of Race

Measure: Blacks’ and Whites’ Verbal GRE Performance

Verbal Test Performance

<table>
<thead>
<tr>
<th></th>
<th># of items solved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Asked to Indicate Race</td>
</tr>
<tr>
<td>blacks</td>
<td></td>
</tr>
<tr>
<td>whites</td>
<td></td>
</tr>
<tr>
<td>blacks</td>
<td></td>
</tr>
<tr>
<td>whites</td>
<td></td>
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Additional Studies Finding Performance Effects

- Women Taking Math Tests
- Latinos taking verbal tests
- Elderly taking short-term memory tests
- Low SES Students taking verbal tests
- Blacks and Miniature Golf
- Women taking tests of Political Knowledge, Driving, Chess, Computers
- White males taking tests of social sensitivity
- Princeton Students from non-preppy backgrounds on math tests
- White Males Taking Math Tests

When White Men Can’t Do Math
When White Men Can’t Do Math

\[ d = .93 \]

"No circle is more vicious than the one having to do with intelligence. Children who may be only a little behind their peers to begin with tend to avoid those things that could have made them a little smarter. As a result they fall further and further behind. Meanwhile the kids who started out a little ahead are doing push-ups with their brains."

Judith Rich Harris

From Vulnerability to Low Ability
From Vulnerability to Low ability
Motivation is Fragile

Stereotype Threat
Avoidance of challenge/evaluation
Lower ability
Underdeveloped Competence

“Victim” of Stereotype Threat

“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”

--Neil de Grasse Tyson
Neil de Grasse Tyson

Verbal SAT score = 500; Lower than G. W. Bush’s

Improving Intellectual Performance: Positive Identity Mindset
A meta-analysis containing 286 data sets and 100,000 subjects found a highly significant male advantage for mental rotation; this pattern remains stable across age and has not decreased in recent years.

Identity Salience Influences Women’s Mental Rotation Performance

Identity Salience Influences Women’s Mental Rotation Performance


Identity Salience Influences Mental Rotation Performance
Improving Motivation and Curiosity: Positive Identity Mindset

Identity Salience and College Major Intentions

Boys and Girls got one of 2 questionnaires at a college fair—one about cafeteria food; the other about resisting conformity, being a “trailblazer”

1. All students expressed negative attitudes toward conformity and cafeteria food.

2. No effect on boys

3. Girls who received the conformity measure before selecting pamphlets were twice as likely to express take pamphlets STEM majors
How Many Girls Requested Information Pamphlets on STEM Majors?

Number of Girls Taking Pamphlets

Questions?
Reducing Identity Threat: The role of self-awareness

Question:
Can understanding stereotype threat reduce its effects?

Method: Forewarning about ST or Test Anxiety

Measure: Blacks’ Test Performance a week later

Self-Awareness/Affirmation Mindset
Affirming Self-Esteem *Can* Help Vulnerable Students’ Performance in School

Geoffrey Cohen et al, 2006

**Method:**
At beginning of school year, Students wrote essays about important personal values
- Own values (experimental group)
- Other people’s values (control group)

**End-of-quarter course grade: Replication**
*(After 2 treatments)*
*(Adjusted for baseline performance within-race)*

![Bar chart showing comparison between European Americans and Minority Students in control and affirmation groups.]
African American’s GRE Performance

Questions?
Reducing Stereotype Threat/Boosting Performance:
The Growth Mindset

Assumptions

• Beliefs about the nature of what is being measured matters, particularly for students under ST

• If the ability being measured is thought to be fixed, disruptive processes (anxiety, avoidance, demotivation) will be higher than if ability in question is thought to be improvable.
Beliefs about Intelligence
Differ Across Experts

“The mind is much more like a muscle than we’ve ever realized… it needs to get cognitive exercise.”

James Flynn, intelligence expert, 2007

“…we do not know how to change intellectual ability after children reach school…”

Charles Murray, Bell Curve coauthor (2008)

ETS statements on what their SAT measures

“For all practical purposes, [IQ tests and Scholastic Aptitude Tests] are the same thing.”

“The SAT is designed to measure aspects of developed ability.”

“Aptitude tests are really the same as ability tests, but neither is the same thing as intelligence.”
Students differ on what SAT Measures

“The SAT measures a student's knowledge gained throughout attended school years and how that knowledge can be applied to questions given by the college board.”  Hispanic Male (17)

“It measures how good you can take a test. I don’t believe it measures your intelligence or how good of a student or person you are.”  White Male (17)

“It measures how smart you are”  Hispanic Male (17)

“I think it tests the speed and thoroughness of one's intellect as well as gained knowledge”  White Male (17)

Experiment

Aronson, McGlone & Alter, (in progress)

Method: Present MCAT test as a test of ability that predicts medical school performance well...

vs a set of problems tapping a skill that can improve and therefore is not a perfectly reliable predictor of medical school performance

Measure: MCAT Test Performance
Threat Instructions

The Test you are about to take, the verbal portion of the MCAT, is in large part, a measure of your verbal intelligence and verbal reasoning ability. As you may know the MCAT is an excellent predictor of how well people perform in medical school. People who do well on the MCAT tend to perform well in Med school because verbal intelligence and reading comprehension, retention and speed are vital to assimilating the large amount of information presented in the Medical school curriculum.

Growth Instructions

The problems you are about to solve are taken from the verbal portion of the MCAT, which is one measure of your preparedness for Medical school. As you may know, the MCAT is not a measure of verbal ability; rather it is a measure of your current level of reading comprehension, retention, and speed, and thus it does not predict performance in medical school very well. All of these skills can improve considerably with practice, so you should view this exercise as a challenge that will improve your level of skill, rather than as a measure of your underlying verbal ability.
Minority Premed Students Verbal MCAT Performance

Experiment
Aronson, McGlone & Alter, (in progress)

Method: Framing GRE Verbal test as an *endowed ability* Vs.. An *improvable skill vs. just like the SAT*

Measure: Test Performance on 24 Verbal GRE items
Conceptions of Ability and Test Performance

Experiment

Question:
Can a growth framing improve math test scores among black school children (aged 9-13) ?

Method: Black North Carolina students primed for race, told that the test measures ability; half are told to think of it as “a challenge that can help you learn math.”

Measure: Math Test Performance (EOG)
Reduction Stereotype Threat in Middle School: A field Intervention

Question: Can psychological intervention raise test scores of minority students?

- Method: mentoring study; attitude change
- Conditions:
  - Malleability of intelligence (Japanese)
  - Role Models: senior students who stress the normality of early difficulty
  - Control (drug abuse message)
- Measure: Texas Assessment of Academic Skills (TAAS)
7th Grade Reading TAAS--Latinos


7th Grade Girls’ Math TAAS

Reducing the effects of Stereotype Threat In the real world: Shaping implicit theories
Aronson, Fried & Good (2002)

Question: Can getting people to believe in expandable intelligence reduce effects of stereotype threat on GPA?

- Method: Attitude change
- Measure: End of year GPA

GPA at Year End

<table>
<thead>
<tr>
<th>GPA (Adjusted by SAT)</th>
<th>Malleable Intelligence Curriculum</th>
<th>Control Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Students</td>
<td>3.6</td>
<td>3.1</td>
</tr>
<tr>
<td>White Students</td>
<td>3.5</td>
<td>3.2</td>
</tr>
</tbody>
</table>
Questions?

Improving Motivation: Meaningfulness
Meaning/Relevance Mindset

- Harackiewicz had students in 9th grade science classes evaluate their expectations for success in their science class. Students were then randomly assigned to one of two conditions:
  - 1) Control condition: Students wrote a brief essay summarizing the material they were covering in science class
  - 2) Experimental condition: Students wrote about the value and usefulness of the material they were covering in class, and how it might relate to their own life.

Do such mindsets work for all students?

What about the truly unmotivated?

Think bout Snooki, seriously, when we talk about teachers, and we try to lay all the blame on them ... watch 'Jersey Shore,' watch it. And tell me what teacher could possibly have reached any one of them, to get any one of their scores up, in any subject.”

Lawrence O’Donnell

Helping others as motivator?
Solar Students

Solar Students
Solar Students

Solar Students
Effects of helping others on Achievement

Method: Low achieving adolescents students randomly assigned to work serve others (e.g., tutoring) or control group

Measure: Suspensions, course failure, pregnancy

Entry to Exit Change in Problem Behaviors: Suspension

% Students Suspended

Control
Teen Outreach

<table>
<thead>
<tr>
<th>Entry</th>
<th>Exit</th>
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<tr>
<td>23.8</td>
<td>28.7</td>
</tr>
<tr>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>0</td>
<td>5</td>
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Entry to Exit Change in Problem Behaviors: Failing Courses

Entry to Exit Change in Problem Behaviors: Teen Pregnancy
Experiment: Motivation in the Face of Threat

Essay paradigm:

108 college students of different ethnicities write essay on the pleasures of college; receives harsh but constructive feedback from an editor.

Manipulation:

“published in a book”

“published in a book to be distributed to poor children in Harlem”

DV: How many students will overcome the ego sting and submit revised essays?

Number of Students who revised essays after harsh feedback

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Published in a Book</th>
<th>Published in a Book for Children</th>
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</thead>
<tbody>
<tr>
<td>Whites</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Hispanics</td>
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<td>1</td>
</tr>
<tr>
<td>Blacks</td>
<td>1</td>
<td>6</td>
</tr>
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</table>
“Insert the phrase 'for the children' into any policy pitch, the pollsters report, and popular support rises 10 percent.”

---David Kirp

Conclusion

Threatening situations can undermine performance and motivation. But if threats can be re-construed as meaningful challenges (i.e. opportunities to develop knowledge or intelligence or to help others) threats can facilitate higher performance and motivation.

In this sense, stereotype threats can be opportunities; they can energize performance and motivation without debilitating them.
Questions?