Rethinking Intelligence

The Role of Mindset in Promoting Success for Academically High-Risk College Students

Rishi R. Sriram, Ph.D.
November 2010

Predicting Academic Success

• Prior academic achievement = best predictor
• Ensure student success: admit only the best
• Limiting to other values colleges espouse
• Fails to convey how colleges can change students

Psychosocial Factors and Student Success

• Link between non-cognitive variables and academic success

• Besides prior academic achievement:
  – Academic effort is the (next) best predictor of students’ learning, development, and achievement
  • (Pascarella & Terenzini, 2005; Robbins, Allen, Casillas, Peterson, & Le, 2006)

An Important Question

How can colleges and universities help foster this kind of academic motivation in their students?

Academically High-Risk Students

• 29-40% in remedial education
  – Funding in jeopardy; Estimated $2 billion per year
  – Demand and cost are at highest points

• Research shows that remedial education is not generally effective in four-year institutions
Self-Theories

• Can students improve?
• Self-theories
  – Beliefs we have about ourselves
  – Create different psychological worlds
  – Lead to a host of thoughts, feelings, actions
• Often implicit
  – Known as mindsets (Dweck, 2006)
  – Domain specific
  – Intelligence most prevalent domain

The Two Mindsets

Fixed Mindset (Entity Theorist)
• Intelligence is static
• Avoid challenges
• Setbacks are detrimental
• Ignore negative feedback
• Performance goals
• Effort is a sign of weakness
  – Ability attributions

Growth mindset (Incremental Theorist)
• Intelligence is malleable
• Embrace challenges
• Setbacks are temporal
• Learn from criticism
• Mastery-oriented goals
• Effort is path to mastery
  – Effort attributions

The Role of Mindset in Helping Academically High-Risk Students

“IT’S DIFFICULT WHEN YOU FEEL DUMMER THAN EVERYONE ELSE IN YOUR CLASS, BUT IT’S WORSE WHEN A PROFESSIONAL ACTS LIKE YOU’RE DUMB JUST BECAUSE OF WHO YOU ARE…WITHOUT GIVING YOU A REAL CHANCE” (Pizzolato, 2004, p. 431)

Gap in the Literature

• Research is relatively limited
• None with academically high-risk students
• Research on effort attributions
  – But none using measurements of self-reported effort

Research Questions

• MINDSET
  – Are there significant differences in mindset before and after students participate in a treatment condition (designed to promote a growth mindset) and a control condition (intended to foster study skills)?

• EFFORT
  – Are there significant differences in academic effort between students who participate in a mindset intervention and those who do not, after controlling for pre-existing levels of academic effort?

• ACHIEVEMENT
  – Are there significant differences in academic achievement between students who participate in a mindset intervention and those who do not, after controlling for college entrance test scores and class rank?
Research Design

• Pretest-posttest control group experimental design with random assignment
  • Two groups:
    – Treatment group (mindset)
    – Control group (study skills)
• Week 1: Pretest in class
• Weeks 2-5: Weekly online sessions (each 15 minutes)
• Week 6: Posttest in class

Dependent Variables

• Dependent Variables
  • Academic effort
    – Academic discipline
    – Academic self-confidence
    – Commitment to college
    – General determination
    – Goal striving
    – Study skills
  • Academic achievement
    • Grade point average

Independent Variable

• Mindset intervention
  • Designed to promote a malleable view of intelligence
• Study skills (control) intervention
  • Designed to foster the use of study skills in academic work

Context & Sample

• Mid-sized, private research university with 12,000 students
• Original sample: 190 first-year students
• Usable data: 105 students
  – Gender: 67% female, 33% male
  – Race
    • 58% European American
    • 22% Hispanic
    • 12% African American

Instrumentation

• Mindset
  – Implicit Theory of Intelligence Scale (3 items)
    • “You can learn new things, but you can’t really change your basic intelligence”
• Academic Effort
  – Student Readiness Inventory (108 items, 10 scales)
    • Academic discipline, Academic self-confidence, Commitment to college, General determination, Goal striving, Study skills
• Academic Achievement
  – Semester GPA obtained from university records

RESULTS
Treatment Fidelity

• Question:
  – Did the mindsets of the students change?
• Statistical Methodology
  – T-tests
    • Compare means of pretest and posttest of mindset (treatment) group
    • Compare means of pretest and posttest for study skills (control) group

Academic Effort

• Question:
  – Is there a difference in effort between the two groups?
• Statistical Methodology
  – Multivariate Analysis of Covariance (MANCOVA)
    • Compare means between the two groups
    • Pretest scores were covariates for preexisting differences in effort

Academic Achievement for Semester

• Question:
  – Is there a difference in grades between the two groups?
• Statistical Methodology
  – Analysis of Covariance (ANCOVA)
    • Compare means between the two groups
    • Used admissions scores as covariates
Academic Achievement: Results

- Subsequent one-way ANCOVA conducted on academic achievement in the remedial course alone

DISCUSSION

Interpretation of Findings

- Driving question:
  - How do colleges and universities increase the motivation and energy students exert toward their academic experiences?
- Results provide framework for understanding:
  - How changing the way students view themselves:
    - In particular their concept of intelligence
    - Helps to increase their academic effort
    - But this effort must be sustained!

Mindset

- Left to itself, mindset is a stable construct
- But mindset can be changed through intervention
  - Interventions can alter mindset in a relatively short amount of time

Academic Effort

Most significant finding of this study:

- Promoting a growth mindset resulted in higher academic effort in college students (Moderately large effect size (partial $\eta^2 = .213$))

Study Skills

- Most ironic finding of this study:
  - Only the study skills variable was significantly different ($p < .001$) between the two groups
    - This statistical difference had a medium effect size (partial $\eta^2 = .132$)
  - Growth mindset group increased in study skills significantly more than the group taught study skills
Conditional Effects

• All students were a vulnerable population
• But other studies particularly highlight the positive influence for students of color
  – Helps overcome stereotype threats (Aronson et al., 2002)
  • Just with African-Americans
• Stereotype threat may explain why such students’ beliefs may be harder to change
  – A short mindset intervention may not have enough power to undo those negative consequences
• Males:
  – Is there a mediating variable between mindset and effort?

Academic Achievement

• No significant difference in grades
• Others have found such an impact
  – (Aronson et al., 2002; Blackwell et al., 2007)
• Why the discrepancy?
  – Time
    • Aronson: 3, one-hour lab sessions (180 minutes)
    • Blackwell: 8, 25-min. computer sessions (200 minutes)
    • Sriram: 4, 15-min. online sessions (60 minutes)
  – Approx. 10 week lapse between last session and final exams

How We Achieve Student Success

• Beliefs affect academic behavior
• If students filter information by their self-theories...
  – ...and if those self-theories convey a fixed intelligence...
  – ...institutional attempts to help may be wasted
• Administrators would be unwise to try and alter the external behaviors of students...
  – ...without also paying attention to their internal mental frameworks and processes

Promoting a Growth Mindset on Campus

• Present findings:
  – Another method for improving effort in students
    • We need to find ways to sustain such improvement
• Amplifier for existing programs and interventions
• Remedial programs
  – First change their self-theories...
  – ...then teach them the skills!

“If I believe that my IQ is my destiny, it will be – but only because I believe it”

John Tagg, The Learning Paradigm College