Evidence in Action

A K20 Center Research Brief

Improving Academic Achievement through Growth Mindset Interventions

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Introduction

The authors situate their study within longstanding evidence that student motivation strongly predicts academic achievement, persistence, and long-term educational outcomes. They highlight that motivation often declines during adolescence, creating risks for disengagement and lower performance. Growth mindset interventions through brief, scalable activities designed to help students understand intelligence as malleable have been shown to improve outcomes for low-achieving students.

The article notes that while prior research has demonstrated that growth mindset interventions can improve achievement, "findings have consistently indicated that growth mindset interventions tend to be particularly effective for historically disenfranchised and low-achieving students" (p. 618). However, little is known about why these interventions work or why effects differ across schools. This study addresses that gap by examining whether challenge-seeking behaviors mediate the intervention's impact and whether this mechanism varies by school achievement level.

Methodology

Research Design:

The study used a multisite randomized controlled trial embedded within the National Study of Learning Mindsets (NSLM). Students within each school were randomly assigned to either the growth mindset intervention (PERTS Modules 1 and 2) or a control condition. The study employed advanced weighting methods to account for sampling design, nonresponse, and mediator selection, enabling causal mediation analysis across multiple school contexts.

Sample:

Participants: 12,490 9th-grade students across 65 U.S. public high schools
Analytic focus: 6,258 low-achieving students, defined as those at or below the school-specific median GPA
Demographics of low-achieving students:

- 41% female

- 40% White
- 12% Black/African American
- 31% eligible for free/reduced-price lunch
- 25% reported mothers with a bachelor's degree or higher

School context: Nationally representative sample of regular U.S. public high schools
Nonresponse: High nonresponse on mediator/outcome measures (mean 86%); authors used nonresponse weights to adjust

Intervention Descriptions:
The intervention was the NSLM online growth mindset program, delivered in two self-administered sessions (PERTS Modules 1 and 2) during school hours. Students in the intervention group completed activities "designed to reduce negative effort beliefs, fixed-trait attributions, and performance avoidance goals and motivate challenge-seeking behaviors" (p. 624). The control group completed sessions about brain functions without mindset content.

Students completed two online sessions (PERTS Modules 1 and 2), where they:

- Read information about intelligence as malleable
- Completed writing activities reinforcing growth mindset concepts

Academic/developmental focus:

- Understanding intelligence as malleable
- Encouraging adaptive responses to academic challenge
- Promoting challenge-seeking behaviors

Delivery method:

- Online, self-administered during regular school hours

Who implemented it:

- Delivered digitally; teachers supervised but did not deliver content

Dosage:

- Number of sessions: 2 (PERTS Modules 1 and 2)
- Length of each session: 25 minutes (Total instructional time: 50 minutes)
- Spacing: Approximately 20-40 days from first to second session

Data Analysis:
The authors used causal mediation analysis with weighting methods to estimate:

- Total intervention effects
- Natural direct effects
- Natural indirect effects via challenge-seeking

- Between-school variation in these effects
- Moderation by school achievement level

The analysis accounted for sampling design, nonresponse, and mediator selection.

Results

Overall Impact

For low-achieving students:

- The intervention significantly increased 9th-grade GPA by 0.213 grade points ($p = .04$).
- Effects varied across schools.

For non-low-achieving students:

- No significant GPA improvement.

Mediation Findings

- Challenge-seeking behaviors partially mediated the intervention's impact, but the average indirect effect was small and not statistically significant.
- However, mediation effects varied significantly across schools.

Moderation by School Achievement Level

Challenge-seeking mediated the intervention's impact only in medium-achieving schools:

- Medium-achieving schools: Indirect effect = 0.084 ($p = .058$)
- Low-achieving schools: No mediation
- High-achieving schools: No mediation

The authors conclude that "challenge-seeking significantly mediated the impact… only in medium-achieving schools" (p. 633).

Practical Interpretation

- Growth mindset interventions can improve achievement for low-achieving students.
- However, context matters: schools must provide supportive environments where challenge-seeking leads to meaningful learning opportunities.

Application into Practice

Schools can use this intervention to help low-achieving 9th graders reframe academic challenges and build adaptive learning behaviors.

Action Steps for Schools

1. Implement two brief online sessions (PERTS Module 1 and 2; 25 minutes each) during school hours.
2. Ensure students complete both sessions approximately 2–3 weeks apart.

3. Create classroom environments that reward challenge-seeking, especially in medium-achieving schools where effects were strongest.
4. Provide opportunities for students to engage with challenging material after the intervention.
5. Support teachers in reinforcing growth mindset messages through feedback and instructional practices.
6. Monitor contextual barriers (e.g., limited resources in low-achieving schools) that may reduce the intervention's effectiveness.
7. Avoid assuming the intervention alone is sufficient—effects depend on alignment between mindset messages and school supports.

Work Cited

Qin, X., Wormington, S., Guzman-Alvarez, A., & Wang, M.-T. (2021). Why does a growth mindset intervention impact achievement differently across secondary schools? Unpacking the causal mediation mechanism from a national multisite randomized experiment. *Journal of Research on Educational Effectiveness, 14*(3), 617–644.