Too Much (or Too Little) Confidence?:

Calibration of Self-Efficacy and Achievement by Race and Socioeconomic Status

Amanda R. Butz, John M. Kupar, Katie E. Pyne, Taylor L. Willett, Allie C. Goodnight, Ciara H. Thompson, & Ellen L. Usher
University of Kentucky

P20 MOTIVATION & LEARNING LAB
A Kentucky P20 Innovation Lab
Do you know this student?

Overconfident, but low achieving
... or like this?

**Over**confident, but **low** achieving

**Under**confident, but **high** achieving
These are poorly-calibrated students

Overconfident, but low achieving

Underconfident, but high achieving
What we know...

• “Large misjudgments of personal efficacy in either direction have consequences.” (Bandura, 1986, p. 394)
What we know...

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• Little is known about the effects of miscalibration. (Schunk & Pajares, 2002)
What we know...

- “Large misjudgments of personal efficacy in either direction have consequences.” (Bandura, 1986, p. 394)

- Little is known about the effects of miscalibration. (Schunk & Pajares, 2002)

- Learners from historically underperforming groups (e.g., ethnic minority students) may be particularly prone to miscalibration. (Aronson & Inzlicht, 2004; Graham, 1994)
Research Questions

**RQ 1:** Does mathematics self-efficacy (general and skills) differ by race and SES?

**RQ 2:** Does mathematics achievement (general and skills) differ by race and SES?

**RQ 3:** How calibrated are students’ efficacy beliefs to their achievement in each racial and SES group?
Participants

- \( N = 2,922 \) students in Grades 4-8

- Higher SES (45%)
- Lower SES (55%)

- White (53%)
- African American (31%)
- Hispanic (9%)
- Asian (3%)
- Other (4%)
Measures

• Math Self-Efficacy
  • **General Self-Efficacy (7 items)**
    How confident are you that you can learn math?
  • **Skills Self-Efficacy (24 items)**
    How confident are you that you can do multiplication with two-digit numbers?
Measures

- Math General Self-Efficacy
- Math Skills Self-Efficacy
- **Achievement scores**
  - First quarter report card grades
  - Percentile score on norm-referenced math test
Analyses

RQ 1: Does mathematics self-efficacy (general and skills) differ by race and SES?

RQ 2: Does mathematics achievement (general and skills) differ by race and SES?

- ANOVA (Race, SES, and Race X SES)
RQ 3: How calibrated are students’ efficacy beliefs to their achievement in each racial and SES group?
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Analyses

**RQ 3**: How calibrated are students’ efficacy beliefs to their achievement in each racial and SES group?

- Miscalibration was determined in two ways:
Analyses

RQ 3: How calibrated are students’ efficacy beliefs to their achievement in each racial and SES group?

- Miscalibration was determined in two ways:
  - Math general self-efficacy and report card grades
Analyses

RQ 3: How calibrated are students’ efficacy beliefs to their achievement in each racial and SES group?

- Miscalibration was determined in two ways:
  - Math general self-efficacy and report card grades
  - Math skills self-efficacy and norm-referenced math test
Results
RQ 1: Does mathematics self-efficacy differ by ethnicity and SES?

- **Yes**, skills self-efficacy and general self-efficacy differ for students of different racial and SES groups.
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- **Yes**, skills self-efficacy and general self-efficacy differ for students of different racial and SES groups.

**General Math Self-Efficacy**

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Score</th>
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<tbody>
<tr>
<td>White</td>
<td>4.67</td>
</tr>
<tr>
<td>African American</td>
<td>4.74</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4.47</td>
</tr>
<tr>
<td>Asian</td>
<td>4.93</td>
</tr>
<tr>
<td>Other</td>
<td>4.60</td>
</tr>
<tr>
<td>Higher SES</td>
<td>4.77</td>
</tr>
<tr>
<td>Lower SES</td>
<td>4.59</td>
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</tbody>
</table>
RQ 1: Does mathematics self-efficacy differ by ethnicity and SES?

- Yes, skills self-efficacy and general self-efficacy differ for students of different racial and SES groups.

- For math skills self-efficacy, the interaction of race and SES was significant.
RQ 2: Does mathematics achievement differ by ethnicity and SES?

- Yes, math report card grades and scores on the norm-referenced test differ for students of different racial and SES groups.
RQ 2: Does mathematics achievement differ by ethnicity and SES?

- **Yes**, math report card grades and scores on the norm-referenced test differ for students of different racial and SES groups.

- Math report card grades differed as a function of the interaction of Race and SES

- Norm-referenced math test scores differed as a function of the interaction of Race and SES
RQ 3: Who is poorly calibrated?
RQ 3: Who is poorly calibrated?

General Self-Efficacy and Report Card Grades

Overconfident

White: 4%
African American: 6%
Hispanic: 3%
Asian: 3%
Other: 3%
RQ 3: Who is poorly calibrated?

General Self-Efficacy and Report Card Grades

Underconfident

- White: 4%
- African American: 5%
- Hispanic: 4%
- Asian: 0%
- Other: 12%
RQ 3: Who is poorly calibrated?

Math Skills Self-Efficacy and Norm-Referenced Math Test

- White: 6%
- African American: 11%
- Hispanic: 7%
- Asian: 2%
- Other: 5%
RQ 3: Who is poorly calibrated?

Math Skills Self-Efficacy and Norm-Referenced Math Test

Underconfident

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>4%</td>
</tr>
<tr>
<td>African American</td>
<td>5%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>3%</td>
</tr>
<tr>
<td>Asian</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>3%</td>
</tr>
</tbody>
</table>
Key Findings & Discussion
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- Miscalibration between self-efficacy and achievement was most pronounced with norm-referenced math tests.
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- Miscalibration between self-efficacy and achievement was most pronounced with norm-referenced math tests.

- African American students were classified as overconfident in higher proportions than students in other racial categories.
Questions?

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Thank you!