INVESTIGATING THE ACHIEVEMENT GAP: ISSUES OF EQUITY AND THE NAEP TEACHER QUESTIONNAIRE

Rick A. Hudson, University of Southern Indiana
Crystal Walcott, Indiana University-Purdue University Columbus
Doris Mohr, University of Southern Indiana

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THREE RELATED STUDIES

- Analyzing Differences in Students’ Encountered Teaching Practices by Race, SES, English Proficiency, and Special Needs Status (Hudson)
- An Examination of Assessment Practices and Issues of Equity (Walcott)
- An Analysis of Teacher Preparation, Demographics and Student Achievement: Do Inequities Exist? (Mohr)
WHAT IS NAEP?

- National Assessment of Educational Progress

- Math assessment is given every two years to students in Grades 4 and 8, and every four years to Grade 12 students

- Only nationally representative measure of student achievement in the United States
CURRENT ANALYSES

- Used 2000-2011 National Public data for grades 4 & 8
- Not all items are posed on each survey, so in some cases longitudinal data does not include data from every NAEP administration
- The NAEP sample is based on a random sampling of students, not teachers. Thus, the results should be reported as the percentage of students who have teachers, not the percentage of teachers.
- Builds on prior analyses by Grouws, Smith & Stein (2004); Lubienski (2003); Mohr, Walcott & Hudson (2012); Smith, Arbaugh, & Fi (2007)
CURRENT ANALYSES’ DEFINITIONS

- **Race/Ethnicity**: Race/Ethnicity used to report trends (school-reported): White, Black, Hispanic, Asian/Pacific Islander, American Indian/Alaska Native, Two or more races

- **Disability**: Classified by school to have a disability, excluding students with 504 plans

- **Socio-economic Status (SES)**: Eligible for National School Lunch Program

- **English Language Proficiency**: Student classified by school as English Language Learner
GOOD NEWS: WE’RE IMPROVING!

NAEP results show growth in student achievement for both 4<sup>th</sup> and 8<sup>th</sup> grades from 1990 to 2011.

Average Scale Scores in 2011:
- 4<sup>th</sup> Grade: 241
- 8<sup>th</sup> Grade: 284

Source: National Center for Educational Statistics
BAD NEWS: THE GAP STILL EXISTS

NAEP Average Scale Score

- White
- Black
- Hispanic
- Asian/Pac.
- American Indian
- 2+ Races


Scores:
- White: 287, 289, 293, 302
- Black: 265, 276, 286, 288
- Hispanic: 258, 269, 276, 276
- Asian/Pac.: 252, 258, 269, 276
- American Indian: 252, 258, 269, 276
- 2+ Races: 252, 258, 269, 276
GOOD NEWS: THE GAP IS SLIGHTLY DECREASING IN GRADE 4

2003 Black/White Gap: 27 points
2011 Black/White Gap: 25 points

NAEP Average Scale Score
BETTER NEWS: THE GAP IS DECREASING EVEN MORE IN GRADE 8

NAEP Average Scale Score

White  Black  Hispanic  Asian/Pac.  American Indian  2+ Races

2003 Black/White Gap: 35 points
2011 Black/White Gap: 24 points
ANALYZING DIFFERENCES IN STUDENTS’ ENCOUNTERED TEACHING PRACTICES BY RACE, SES, ENGLISH PROFICIENCY, AND SPECIAL NEEDS STATUS

Rick A. Hudson
University of Southern Indiana
According to results of the NAEP teacher questionnaire, do students from different demographic groups encounter differences in the grouping and mathematical instructional practices?
HOMEWORK PRACTICES

Teachers respond to the question “Approximately how much mathematics homework do you assign to students in this class each day?”

- Grade 4 Responses: None, 15 minutes, 30 minutes, 45 minutes, 1 hour, More than 1 hour
- Grade 8 Responses: None, less than 1 hour, about 1 hour, 2 to 3 hours, more than 3 hours
WHAT DOES IT MEAN?

- Teachers of white students report giving less homework to their students than students from other racial groups.

- Other interpretations?
EMPHASIS ON MEASUREMENT

Teachers respond to “Think about your plans for this mathematics class for the entire year. How much emphasis did you or will you give each of the following? Fill in one oval on each line.” [Measurement, Data/Probability, Algebra, Geometry, Number and Operations]

Possible responses: Little or no emphasis; moderate emphasis; heavy emphasis

An earlier research study by Lubienski (2003) documented that when evaluating the 5 content subscale scores, the racial gap is greatest within the measurement subscale.
WHITE/BLACK GAP BY SUBSCALE (GR 8)

The chart shows the white/black gap by subscale (GR 8) from 2000 to 2011. The subscales include Algebra, Data/Prob, Geometry, Measurement, and Number P&O. The data indicates a trend of decreasing gap over the years for most subscales, with some fluctuations.
EMPHASIS ON MEASUREMENT: GRADE 4

- Little: 5 (White), 4 (Black), 7 (Hispanic), 6 (Asian/Pac.), 5 (American Indian), 6 (2+ Races)
- Moderate: 64 (White), 57 (Black), 58 (Hispanic), 66 (Asian/Pac.), 57 (American Indian), 64 (2+ Races)
- Heavy: 31 (White), 39 (Black), 35 (Hispanic), 39 (Asian/Pac.), 27 (American Indian), 31 (2+ Races)
Even though the greatest differences between content areas continue to be in the measurement subscale, Black students’ teachers claimed that they primarily placed a heavy or moderate emphasis on measurement content.
TRACKING

Teachers respond to “Are students assigned to this class by ability?”

Possible responses: Yes; No

Our prior analyses have shown that students whose teachers respond YES to this score higher.
% OF STUDENTS WHOSE TEACHERS RESPONDED YES (2011)

<table>
<thead>
<tr>
<th>Race</th>
<th>Grade 4</th>
<th>Grade 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>23</td>
<td>67</td>
</tr>
<tr>
<td>Black</td>
<td>21</td>
<td>53</td>
</tr>
<tr>
<td>Hispanic</td>
<td>17</td>
<td>59</td>
</tr>
<tr>
<td>Asian/Pac. Is.</td>
<td>23</td>
<td>75</td>
</tr>
<tr>
<td>American Indian</td>
<td>17</td>
<td>51</td>
</tr>
<tr>
<td>2+ Races</td>
<td>23</td>
<td>67</td>
</tr>
</tbody>
</table>

- White: 23% Grade 4, 67% Grade 8
- Black: 21% Grade 4, 53% Grade 8
- Hispanic: 17% Grade 4, 59% Grade 8
- Asian/Pac. Is.: 23% Grade 4, 75% Grade 8
- American Indian: 17% Grade 4, 51% Grade 8
- 2+ Races: 23% Grade 4, 67% Grade 8
ABILITY GROUPING

- Teachers respond to the question: “Do you create groups within this class for mathematics instruction on the basis of ability?”

- Our prior analyses have shown that students score lower when their teachers answer YES to this question.
% OF STUDENTS WHOSE TEACHERS RESPONDED YES (2011)

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Grade 4</th>
<th>Grade 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>59</td>
<td>38</td>
</tr>
<tr>
<td>Black</td>
<td>71</td>
<td>56</td>
</tr>
<tr>
<td>Hispanic</td>
<td>66</td>
<td>50</td>
</tr>
<tr>
<td>Asian/Pac. Is.</td>
<td>63</td>
<td>39</td>
</tr>
<tr>
<td>American Indian</td>
<td>48</td>
<td>40</td>
</tr>
<tr>
<td>2+ Races</td>
<td>65</td>
<td>46</td>
</tr>
</tbody>
</table>

Grade 4  Grade 8
% OF STUDENTS WHOSE TEACHERS RESPONDED YES (2011)

<table>
<thead>
<tr>
<th></th>
<th>Grade 4</th>
<th>Grade 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disability</td>
<td>67</td>
<td>51</td>
</tr>
<tr>
<td>No Disability</td>
<td>62</td>
<td>43</td>
</tr>
</tbody>
</table>

Grade 4: 
- Disability: 67%
- No Disability: 62%

Grade 8: 
- Disability: 51%
- No Disability: 43%
% OF STUDENTS WHOSE TEACHERS RESPONDED YES (2011)

- NSLP Eligible:
  - Grade 4: 64
  - Grade 8: 49

- Not Eligible:
  - Grade 4: 61
  - Grade 8: 39
% OF STUDENTS WHOSE TEACHERS RESPONDED YES (2011)

<table>
<thead>
<tr>
<th>Grade</th>
<th>ELL</th>
<th>Not ELL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>65</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>51</td>
<td>43</td>
</tr>
</tbody>
</table>

Grade 4

Grade 8
WHAT IT MEANS?

- Students who are Black/Hispanic/Multiracial, Disabled, Low SES, and ELL tend to be placed into groups based on ability more frequently than their peers.

- Our prior research has shown that within the national sample, students who are grouped by ability perform lower.

- Note that the NAEP questionnaire does not measure how frequently ability groups are used.
SETTING DIFFERENT STANDARDS

Teachers respond to the question: “When you teach mathematics to your fourth-grade class, do you set different achievement standards for some students?”

Possible responses: Not at all, small extent, moderate extent, large extent

Students whose teachers responded “not at all” performed substantially better than those responding “large extent.”
% OF STUDENTS WHOSE TEACHERS RESPONDED “NOT AT ALL” (2011)

<table>
<thead>
<tr>
<th></th>
<th>Grade 4</th>
<th>Grade 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Black</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Asian/Pac. Is.</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>American Indian</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>2+ Races</td>
<td>10</td>
<td>17</td>
</tr>
</tbody>
</table>
% OF STUDENTS WHOSE TEACHERS RESPONDED “NOT AT ALL” (2011)

<table>
<thead>
<tr>
<th></th>
<th>Disability</th>
<th>No Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 4</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>Grade 8</td>
<td>11</td>
<td>17</td>
</tr>
</tbody>
</table>

Disability

No Disability

Grade 4          | Grade 8

Grade 4          | Grade 8
% OF STUDENTS WHOSE TEACHERS RESPONDED “NOT AT ALL” (2011)

NSLP Eligible

Grade 4 | Grade 8
---|---
10 | 15

Not Eligible

Grade 4 | Grade 8
---|---
11 | 18
% OF STUDENTS WHOSE TEACHERS RESPONDED “NOT AT ALL” (2011)
WHAT IT MEANS?

- Research has shown the need to differentiate instruction based on the learner.
- NAEP findings suggest that those that students whose teachers differentiate learning goals score higher on NAEP.
- Current analyses suggest that students from underrepresented groups tend to experience slightly more differentiation in learning standards than majority groups. (The exception is ELL students in fourth grade.)
QUESTIONS & COMMENTS
THANKS!

- Rick Hudson  rhudson@usi.edu
- Crystal Walcott  walcottc@iupuc.edu
- Doris Mohr  djmohr@usi.edu