Large-Scale Assessment and Survey Data in Education: Challenges and Opportunities

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Presentation based on:


Examples of Large-Scale Surveys

- **International large-scale surveys**
  - **late 1950s** - International Association for the Evaluation of Education Achievement (IEA)
    - Trends in International Mathematics and Sciences Study (TIMSS)
    - Progress in International Reading Literacy Study (PIRLS)
    - International Computer and Information Literacy Study (ICILS)
    - International Civic and Citizenship Education Study (ICCS)
    - Responses to Educational Disruption Survey (REDS)
  - OECD Product
    - Program for International Student Assessment (PISA)
    - Teaching and Learning International Survey (TALIS)

- **U.S. large-scale surveys**
  - **1960s** – National Assessment of Educational Progress (NAEP)
  - High School Longitudinal Study (HSLS:09)
  - Youth Risk Behavior Surveillance System (YRBSS)

- **U.S. & international surveys**
  - **1980s** – TIMSS, PISA, PIRLS, TALIS, ICILS
  - National Center for Education Statistics (NCES)
Opportunities for Grad Students and Faculty

- AERA Dissertation Grant & AERA Research Grant

The Grants Program is open to field-initiated research and welcomes proposals that:

1. develop or benefit from advanced statistical or innovative quantitative methods or measures;
2. analyze more than one large-scale national or international federally funded data set, or more than one statewide longitudinal data system (SLDS) or incorporate other data enhancements;
3. integrate, link, or blend multiple large-scale data sources; or
4. undertake replication research of major findings or major studies using large-scale, federally supported or enhanced data.
<table>
<thead>
<tr>
<th>Title</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>How college affects students: Toward the reconciliation of theory with empirical evidence</td>
<td>B&amp;B</td>
</tr>
<tr>
<td>An exploratory investigation of internalizing problem behavior among children from kindergarten to third grade</td>
<td>ECLS-K</td>
</tr>
<tr>
<td>Does school matter for the low SES student? Investigating the causal effects of school context on college enrollment</td>
<td>ELS</td>
</tr>
<tr>
<td>The effects of ability grouping on mathematics achievement: A hierarchical modeling approach with balanced comparison groups</td>
<td>L-SAY</td>
</tr>
<tr>
<td>The stringency of the NCLB accountability standards, incentives and performance: Multilevel analysis of NAEP data</td>
<td>NAEP</td>
</tr>
<tr>
<td>Investigating the causal effects of student mobility on negative academic outcomes: Who is disproportionately affected by transferring during high school?</td>
<td>NELS</td>
</tr>
<tr>
<td>A longitudinal study of the educational attainment process: Examining the effects of environmental and social stressors on students' educational trajectory</td>
<td>NELS:88</td>
</tr>
<tr>
<td>School factors affecting postsecondary career pursuits of high-achieving girls in math and science Abstract</td>
<td>NELS:88</td>
</tr>
<tr>
<td>The Role of Reading Comprehension in Large-Scale Subject-Matter Assessments</td>
<td>TIMSS-99</td>
</tr>
<tr>
<td>Parental involvement in 34 nations: A comparative study from the TIMSS 1999 data Abstract</td>
<td>TIMSS-99</td>
</tr>
</tbody>
</table>

**Institutions:**
- Baccalaureate and Beyond Longitudinal Study
- Early Childhood Longitudinal Program
- Education Longitudinal Study
- Longitudinal Study of American Youth
- National Education Longitudinal Study
Training Opportunities and workshops

- **Training and Workshops**
  - NAEP data training workshops (for both students and faculty)
  - PhD internships,
    - Application Deadline: usually Feb 15
  - Post-doctorate appointments, and
  - Cooperative agreements.

http://naep-research.airprojects.org/
Common Designs of LSAS

[Every 2-4 years]

➢ Cognitive Assessment in multiple subject domains
  o Math, science, reading, writing, arts, civics, geography economics, history, Technology & Engineering Literacy (TEL), Collaborative Problem Solving - PISA 2015

➢ Context questionnaires
  o TIMSS: student, home, teacher, school, curriculum
  o NAEP: student, teacher, school, etc.

➢ Other
  ▪ Paper-based, computer-based, digital/tablet-based
TIMSS 2019 Context Questionnaires

- Home, **school**, teacher, student, curriculum

- **School questionnaire**
  - Administered to school principals
  - 4th & 8th Grades
  - Domains
    - level of students’ literacy and numeracy skills when they first enter the school,
    - the availability of instructional resources,
    - the socioeconomic background of the students attending the school,
    - the school’s emphasis on academic success, the need for discipline, and the principals’ education.
TIMSS 2019 Context Questionnaires

- Home, school, **teacher**, student, curriculum

- **Teacher questionnaire**
  - Administered to student teachers
  - Single form at 4th Grade – assuming the same teachers taught both math and science; but separate versions for math and science at 8th grade.
  - Domains
    - the teachers’ education, professional development, and career satisfaction as well as about students’ readiness for instruction,
    - the frequency they do various instructional activities, difficulties in providing instruction, curriculum topics covered, assessment practices, and availability of computers for instruction.
TIMSS 2019 Context Questionnaires

- Home, school, teacher, student, curriculum

- **Student questionnaire**
  - Both 4\textsuperscript{th} and 8\textsuperscript{th} grades
  - Separate versions of science (as a single subject or separate subjects such as earth science, physics) at 8\textsuperscript{th} grade in some countries
  - Administered together with cognitive assessments
  - Domains
    - educational experiences at home and school related to learning mathematics and science,
    - attitudes toward learning mathematics and science
    - [extra for eTIMSS]: experience taking the eTIMSS assessment and their familiarity with digital devices.
TIMSS 2019 Context Questionnaires

- Home, school, teacher, student, curriculum
- Student questionnaire

**MS2**

How much do you agree with these statements about learning mathematics?

*Fill one circle for each line.*

- a) I enjoy learning mathematics
- b) I wish I did not have to study mathematics
- c) Mathematics is boring
- d) I learn many interesting things in mathematics
- e) I like mathematics
- f) I like any schoolwork that involves numbers

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1. **A. Did you like that this test was on a computer or tablet?**
   - I liked it a lot
   - I liked it a little
   - I didn’t like it very much
   - I didn’t like it at all

2. **B. Did you have any of these difficulties?**
   - a) It was hard to type
   - [Yes] [No]

*Click one circle for each row.*
TIMSS Longitudinal Study 2023-2024

https://timssandpirls.bc.edu/timss2023/longitudinal-study.html

IEA’s TIMSS continues to drive innovation in international comparative assessments of student achievement in mathematics and science by offering the TIMSS 2023 Longitudinal Study, an optional extension of TIMSS 2023 that explores student learning gains over one year of schooling. **Countries participating in the TIMSS 2023 Longitudinal Study will re-assess their original sample of TIMSS 2023 students for the second time in 2024, creating two data points of student achievement.** The TIMSS 2023 Longitudinal Study will provide the same group-level achievement data as TIMSS 2023 and allow a closer look into individual learning gains over time. This exciting new design expands the range of research questions that can be answered using TIMSS data and promises new insights that education policymakers and researchers worldwide can use to strengthen education systems.
Dai et al. (2023)

PISA reading achievement: identifying predictors and examining model generalizability for multilingual students

Shenghai Dai, Tao Hao, Yuliya Ardasheva, Onur Ramazan, Robert William Danielson, Bruce Austin

Abstract
Reading research in the United States has mainly focused on early or, less frequently, middle grades and on monolingual (MN or English-only) rather than on multilingual (ML) students. To address these gaps, we focused on factors contributing to high school ML students’ reading achievement. In particular, we first used machine learning to identify predictors of high school students’ reading achievement on PISA 2018. We then conducted multilevel modeling on the entire sample (baseline model) and tested the model’s generalizability to ML and MN populations. Results suggest that ML students would benefit from instruction focused on enhancing their reading self-efficacy and increased learning opportunities for extracurricular reading activities. The results also suggest that students, especially ML students, would benefit from schools avoiding grade retention policies and focusing on minimizing truancy and supporting positive peer and teacher relationships. Limitations of the study and future directions are discussed.
Dai et al. (2023) - Background

- **English learners (Multilingual learners)**
  - Fastest growing school-aged U.S. population both in size and percentage
  - Culturally diverse – speak over 400 different languages

- **Reading literacy**
  - Fundamental for student achievement across content areas, especially for English learners (ELs)
  - Critical to economic growth and public health
  - Impacted by a host of student-, classroom-, and school-level characteristics

- **Need for research**
  - There is a pressing need to uncover the underlying impacts of multiple, nested systems on improving reading literacy for students, especially ELs.
1. **What predictors** of reading achievement **are most salient** at the student, teacher, and school levels?

2. What are the **relative contributions of the most salient** student-, teacher-, and school-level constructs to students’ reading achievement?

3. What are the **relative contributions** of the most salient student-, teacher-, and school-level constructs to students’ reading achievement **disaggregated by language status**?
Dai et al. (2023) - Data

- Programme for International Student Assessment (PISA)
  - U.S. 2018 reading assessment data
  - 4838 students, 3526 teachers, and 164 schools

- Variables
  - **Outcome**: Overall reading performance (20 sets of plausible values)
  - **Predictors**: a total number of 1482 variables
    - Student level – 943
    - Teacher level – 347
    - School level – 192
Dai et al. (2023) - Methods

1. **What predictors** of reading achievement are **most salient** at the student, teacher, and school levels?
   - **Step 1: Variable selection**
     - Statistical evidence: Machine learning variable selection (Elastic Net analysis)
     - Theoretical and literature support – expert panel
     - Variable preparation – generating composites (CFA & PCA)

2. What are the **relative contributions of the most salient** student-, teacher-, and school-level constructs to students’ reading achievement?
   - **Step 2: Multilevel modeling: General model for the entire sample**

3. What are the **relative contributions** of the most salient student-, teacher-, and school-level constructs to students’ reading achievement **disaggregated by language status**?
   - **Step 3: Multilevel modeling for ELs and native speakers**
Dai et al. (2023) - Steps

- **Step 0: Data management and preparation**
  - Merging datasets from different levels
    - Issues: students nested within schools but not teachers
  - Missing data
    - Different coding: omitted, no reached, multiple, etc.
    - Proportions: 0% ~ 100%.

- **Step 1: Variable selection**
  - Elastic Net analysis (in R)
    - Missing data imputation
    - Analysis for each of the 20 sets of plausible values
    - Compiling 20 sets of results (i.e., 20 lists of ranked variables)
  - Expert panel discussion
    - One final list of variable
  - Combining variables (variable composites with CFA & PCA using both SPSS and Mplus)
    - One final final list of variables for MLM

- **Step 2: Multilevel modeling using the entire sample**
  - Missing data imputation (again, using R)
  - Hierarchical by entering variables at student, teacher, and school variable (using R)
    - Null model, random intercept, random slope models
    - MLM using each plausible value, resulting in 20 sets of results
    - Combining 20 sets of the results using multiple imputation

- **Step 3: Multilevel modeling for ELs and native speakers**
  - Same as step 2
### Results

**Table 5**

*Model Parameter Estimates with the Entire Student Sample (N = 4838)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Student Predictors</th>
<th>Student &amp; Teacher Predictors</th>
<th>Full Model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intercept</strong></td>
<td>501.06</td>
<td>501.19</td>
<td>501.41</td>
</tr>
<tr>
<td><strong>Effort#</strong></td>
<td>12.19</td>
<td>12.20</td>
<td>12.20</td>
</tr>
<tr>
<td><strong>Words Understood</strong></td>
<td>1.45</td>
<td>1.45</td>
<td>1.46</td>
</tr>
<tr>
<td><strong>ISCED Level</strong></td>
<td>33.64</td>
<td>33.63</td>
<td>33.64</td>
</tr>
<tr>
<td><strong>Grade Repetition</strong></td>
<td>-26.33</td>
<td>-26.34</td>
<td>-26.33</td>
</tr>
<tr>
<td><strong>Books at Home</strong></td>
<td>10.34</td>
<td>10.34</td>
<td>10.34</td>
</tr>
<tr>
<td><strong>Digital Affordance</strong></td>
<td>26.23</td>
<td>26.23</td>
<td>26.23</td>
</tr>
<tr>
<td><strong>Metacognition</strong></td>
<td>33.63</td>
<td>33.63</td>
<td>33.63</td>
</tr>
<tr>
<td><strong>Self Efficacy#</strong></td>
<td>15.57</td>
<td>15.57</td>
<td>15.57</td>
</tr>
<tr>
<td><strong>Peer Interaction#</strong></td>
<td>15.27</td>
<td>15.27</td>
<td>15.27</td>
</tr>
<tr>
<td><strong>Perceptions of Instructional Support#</strong></td>
<td>4.22</td>
<td>4.21</td>
<td>4.22</td>
</tr>
<tr>
<td><em><em>Initial Training</em> / / /</em>*</td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><em><em>Training Relevance</em> / / /</em>*</td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><em><em>Teaching Experience</em> / / /</em>*</td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><strong>Teacher Belief / / /</strong></td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><strong>Teaching Strategy# / / /</strong></td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><strong>Reading Habit# / / /</strong></td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><em><em>Job Satisfaction</em> / / /</em>*</td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><strong>School Type (0=Private, 1=Public)</strong></td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><em><em>Enrollment</em> / / /</em>*</td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><em><em>School Resources</em> / / /</em>*</td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><strong>Student Truancy / / /</strong></td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><em><em>Extracurricular Literacy</em> / / /</em>*</td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><strong>Discuss Progress with Parents (%) / / /</strong></td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><em><em>Use of Assessment</em> / / /</em>*</td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><strong>Computer WWW Connection / / /</strong></td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><strong>Use of Digital Devices / / /</strong></td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><strong>Career Guidance Responsibility (0=Not Checked, 1=Checked)</strong></td>
<td>/ / /</td>
<td>/ / /</td>
<td>/ / /</td>
</tr>
<tr>
<td><strong>Variance Components</strong></td>
<td>2240.344</td>
<td>2213.838</td>
<td>1829.922</td>
</tr>
<tr>
<td><strong>School (between)</strong></td>
<td>5466.048</td>
<td>5465.598</td>
<td>5466.405</td>
</tr>
<tr>
<td><strong>Model Fit</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ICC</strong></td>
<td>0.29</td>
<td>0.29</td>
<td>0.25</td>
</tr>
<tr>
<td><strong>Likelihood Ratio Test</strong></td>
<td>$F (11, 479) = 221.972, p &lt; .001$</td>
<td>$F (7, 189300) = 1.325, p = 0.233$</td>
<td>$F (10, 208400) = 3.755, p &lt; .001$</td>
</tr>
<tr>
<td><strong>L1 R Square</strong></td>
<td>0.44</td>
<td>0.44</td>
<td>0.44</td>
</tr>
<tr>
<td><strong>L2 R Square</strong></td>
<td></td>
<td></td>
<td>0.11</td>
</tr>
</tbody>
</table>

*Note. ICC = intraclass correlation, $\beta$ = Standardized coefficients.*
### Results

**Table 6**

*Full Model Parameter Estimates (Multilingual vs. Monolingual Students)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Multilingual Students (N = 736)</th>
<th>Monolingual Students (N = 4054)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Est</td>
<td>SE</td>
</tr>
<tr>
<td>Intercept</td>
<td>484.53</td>
<td>5.68</td>
</tr>
<tr>
<td>Effort</td>
<td>-11.26</td>
<td>3.18</td>
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<tr>
<td>Words Understood</td>
<td>-2.40</td>
<td>4.48</td>
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<tr>
<td>ISCED Level</td>
<td>-8.70</td>
<td>13.97</td>
</tr>
<tr>
<td>Grade Repetition</td>
<td>-42.54</td>
<td>12.05</td>
</tr>
<tr>
<td>Musical Instrument</td>
<td>8.76</td>
<td>3.37</td>
</tr>
<tr>
<td>Books at Home</td>
<td>12.80</td>
<td>3.31</td>
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<tr>
<td>Digital Affordance</td>
<td>24.78</td>
<td>4.08</td>
</tr>
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<td>Metacognition</td>
<td>33.96</td>
<td>4.01</td>
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<tr>
<td>Self Efficacy</td>
<td>20.63</td>
<td>3.28</td>
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<tr>
<td>Peer Interaction#</td>
<td>21.55</td>
<td>3.80</td>
</tr>
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<td>Perceptions of Instructional Support</td>
<td>5.11</td>
<td>3.62</td>
</tr>
<tr>
<td>Initial Training</td>
<td>-1.68</td>
<td>10.38</td>
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<tr>
<td>Training Relevance</td>
<td>-6.94</td>
<td>14.91</td>
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<tr>
<td>Teaching Experience</td>
<td>-6.63</td>
<td>4.37</td>
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<td>Teacher Belief</td>
<td>1.32</td>
<td>20.17</td>
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<td>Teaching Strategy</td>
<td>8.71</td>
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<td>Reading Habit</td>
<td>-9.89</td>
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<tr>
<td>Job Satisfaction</td>
<td>-6.24</td>
<td>7.71</td>
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<td>School Type (0=Private, 1=Public)</td>
<td>-25.22</td>
<td>28.79</td>
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<tr>
<td>Enrollment</td>
<td>-0.03</td>
<td>0.23</td>
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<tr>
<td>School Resources</td>
<td>1.99</td>
<td>6.07</td>
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<tr>
<td>Student Truancy</td>
<td>-25.28</td>
<td>8.07</td>
</tr>
<tr>
<td>Extracurricular Literacy</td>
<td>3.24</td>
<td>1.56</td>
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<tr>
<td>Discuss Progress with Parents (%)</td>
<td>0.20</td>
<td>0.25</td>
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<td>Use of Assessment</td>
<td>1.13</td>
<td>1.64</td>
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<tr>
<td>Computer WWW Connection</td>
<td>0.00</td>
<td>0.01</td>
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<tr>
<td>Use of Digital Devices</td>
<td>0.75</td>
<td>6.36</td>
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<tr>
<td>Career Guidance Responsibility (0=Not Checked, 1=Checked)</td>
<td>10.72</td>
<td>29.22</td>
</tr>
</tbody>
</table>

**Variance Components**

- **School (between)**: 1963.9
- **Student (within)**: 5532.3

**Model Fit**

- **F (10, 761) = 1.851, p = 0.049**
- **F (10, 193481) = 4.85, p < .001**

**Note.** ICC = intraclass correlation, β = Standardized coefficients.
Students’ 2018 PISA reading self-concept: Identifying predictors and examining model generalizability for emergent bilinguals

Onur Ramazan\textsuperscript{a},\* Shenghai Dai\textsuperscript{a}, Robert William Danielson\textsuperscript{b}, Yuliya Ardasheva\textsuperscript{c}, Tao Hao\textsuperscript{d}, Bruce W. Austin\textsuperscript{a}

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\textsuperscript{c} College of Education, Washington State University, Richland, WA, USA
\textsuperscript{d} Faculty of Education, East China Normal University, Shanghai, China
Challenges

- Complex sampling design: **sampling weights** that need to be considered to ensure the data is representative

- Multiple sets of **plausible values** used as proxies of student outcome
  - Need to conduct analysis using all PVs and then combining results using multiple imputation

- **Hierarchical data structure** – multilevel models

- Different types and proportions of **missing data**

- Specialized techniques and software tools (usually not part of the curricula of most educational graduate and certificate programs)

- Some may need a restricted data license

- …
Software Availability

Online interactive tools
- Online-based interactive tools that make it possible for users to run their analysis without downloading and managing the data
  - International Data Explorer (IDE) - PISA, PIRLS, TIMSS, PIAAC, and TALIS
  - NAEP Data Explorer (NDE)
  - NCES Data Lab – HSLS, NTPS, SASS, etc.
- Common statistical methods, including descriptive statistics such as mean, charts, significance test, gap analysis, and linear regression analysis.

Other software
- IES IDB Analyzer (current version 4.0) – Dependent on SAS or SPSS
- AM software
- R package – EdSurvey
- SPSS, SAS, Mplus, etc.
Effects of classroom and school climate on language minority students’ PISA mathematics self-concept and achievement scores

Onur Ramazan¹*, Robert William Danielson², Annick Rougee³, Yuliya Ardasheva³ and Bruce W. Austin¹
Table 1: School and Classroom Climate Contributions to Mathematics Self-Concept: Hierarchical Regression Model Results in the Aggregated Sample

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1: PMCE</th>
<th>Model 2: PMCE + CMCE</th>
<th>Model 3: PMCE + CMCE + SLF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>Std. 95% CI</td>
<td>$\beta$</td>
</tr>
<tr>
<td>MTCM</td>
<td>0.175***</td>
<td>0.126, 0.224</td>
<td>0.108***</td>
</tr>
<tr>
<td>MTS</td>
<td>0.039</td>
<td>$-$ 0.014, 0.092</td>
<td>$-$ 0.007</td>
</tr>
<tr>
<td>CAML</td>
<td>0.116***</td>
<td>0.067, 0.165</td>
<td>0.088**</td>
</tr>
<tr>
<td>DC</td>
<td>0.096***</td>
<td>0.053, 0.139</td>
<td></td>
</tr>
<tr>
<td>TS</td>
<td>0.470***</td>
<td>0.098, 0.196</td>
<td></td>
</tr>
<tr>
<td>SBS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total $R^2$</td>
<td>0.074***</td>
<td></td>
<td>0.098***</td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td>0.074***</td>
<td></td>
<td>0.024***</td>
</tr>
<tr>
<td>$f^2$</td>
<td>0.080</td>
<td></td>
<td>0.027</td>
</tr>
</tbody>
</table>

MTCM = Mathematics Teacher’s Classroom Management, MTS = Mathematics Teacher’s Support, CAML = Cognitive Activation in Mathematics Lessons, DC = Disciplinary Climate, TS = Teacher Support, SBS = Sense of Belonging to School, TSR = Teacher Student Relations. PMCE = Perceived Prior mathematics classroom experience, CMCE = Perceived Current mathematics classroom experience, SLF = Perceived School-level factors.

$N = 3144$. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. $\beta =$ standardized regression coefficient. $f^2 =$ Cohen’s $f^2$ for effect size.
Analysis with IDB Analyzer

1. Select data file & Define survey context

2. Define Analysis type and others

3. Select Variables

4. Generate SPSS syntax and run
PROGRESS OF ENGLISH LEARNERS WITH DISABILITIES ON NAEP READING

Sara E.N. Kangas, Ph.D.  Shenghai Dai, Ph.D.  Yuliya Ardasheva, Ph.D.
Kangas et al. (accepted)

**Figure 1** Change in NAEP Scores in 4th and 8th Grade Reading (2009 to 2019)

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**Note.** EL = English Learners; SD = Student with Disabilities; Former EL = Students who tested out of language services; Two category EL status: 1) Not EL and 2) EL; Three category EL status: 1) Not EL, 2) EL, and 3) Former EL.
<table>
<thead>
<tr>
<th>Grade</th>
<th>Year</th>
<th>Model Summary</th>
<th>Regression Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$R^2$</td>
<td>$F$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2019</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2017</td>
<td>0.22</td>
</tr>
<tr>
<td>G4</td>
<td></td>
<td>2015</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2013</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2011</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2009</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2019</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2017</td>
<td>0.20</td>
</tr>
<tr>
<td>G8</td>
<td></td>
<td>2015</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
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<td>2013</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2011</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2009</td>
<td>0.18</td>
</tr>
</tbody>
</table>

*Note.* EL = English Learners, SD = Student with Disabilities, two category EL status: 1) Not EL and 2) EL. Both variables SD and ELL were dummy coded in the regression analyses. $SD = Yes$ and $EL = Yes$ were treated as the reference groups, respectively.
Kangas et al. (accepted)

- https://www.nationsreportcard.gov/ndecore/landing

With the NAEP Data Explorers you can create statistical tables, charts, maps to help you find answers. Explore decades of assessment results, as well as information about factors that may be related to student learning.

NOT SURE WHERE TO START? Search all databases.

(Enter a grade, subject, state, or student group to see a list of related results.)
### Kangas et al. (accepted)

**Reading, Grade 4, Student disability or English learner status**

**SELECTED CRITERIA**
- NAEP (National Assessment of Educational Progress)
- Framework: 1992 Reading
- Scale: Composite scale
- Jurisdiction: National
- Variables: Student disability or English learner status [SDELL]
- Statistic: Average scale scores, Percentages

Click on an available wizard below to build reports.

**DATA TABLE 1**

<table>
<thead>
<tr>
<th>Year</th>
<th>Jurisdiction</th>
<th>Student with disability (SD)</th>
<th>Average scale score</th>
<th>Percentage</th>
<th>English language learner (ELL)</th>
<th>Average scale score</th>
<th>Percentage</th>
<th>Both SD and ELL</th>
<th>Average scale score</th>
<th>Percentage</th>
<th>Neither SD nor ELL</th>
<th>Average scale score</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>National</td>
<td>187</td>
<td>12</td>
<td></td>
<td>196</td>
<td>10</td>
<td></td>
<td>161</td>
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<td></td>
<td>230</td>
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<td></td>
</tr>
<tr>
<td>2017</td>
<td>National</td>
<td>190</td>
<td>11</td>
<td></td>
<td>193</td>
<td>9</td>
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<td>163</td>
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<td></td>
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<tr>
<td>2015</td>
<td>National</td>
<td>191</td>
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<td></td>
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<td>1</td>
<td></td>
<td>231</td>
<td>78</td>
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<tr>
<td>2013</td>
<td>National</td>
<td>188</td>
<td>10</td>
<td></td>
<td>192</td>
<td>8</td>
<td></td>
<td>151</td>
<td>1</td>
<td></td>
<td>230</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>
Resources

- College Results Online: http://www.collegeresults.org
- Ed Data Express: https://eddataexpress.ed.gov/index.cfm
- International Activities Program (IAP): https://nces.ed.gov/surveys/international
- International Association for the Evaluation of Educational Achievement (IEA): https://www.iea.nl
- Integrated Postsecondary Education Data System (IPEDS): https://nces.ed.gov/ipeds
- National Assessment for Educational Progress (NAEP): https://nces.ed.gov/nationsreportcard
- National Indian Education Study (NIES): https://nces.ed.gov/nationsreportcard/nies
- Program for the International Assessment of Adult Competencies (PIAAC): https://nces.ed.gov/surveys/piaac
- Programme for International Student Assessment (PISA): http://www.oecd.org/pisa
- Progress in International Reading Literacy Study (PIRLS): https://timssandpirls.bc.edu
- Trends in International Mathematics and Science Study (TIMSS): https://timssandpirls.bc.edu
Resources

Introductory Readings to Large-Scale Surveys


Workshops and Trainings

- NAEP Research and Development Program: [http://naep-research.airprojects.org](http://naep-research.airprojects.org)

- NCES Cooperative System Fellows Program: [https://ies.ed.gov/whatsnew/conferences/?id=184&cid=2](https://ies.ed.gov/whatsnew/conferences/?id=184&cid=2)
Equipping Your Quant Skills - Courses

**Measurement & Psychometrics**

- **ED PSYCH 509** Educational Measurement: Test Development and Assessment
- **ED PSYCH 511** Classical and Modern Test Theory
- **ED PSYCH 577** Item Response Theory
- **ED PSYCH 578** Advanced Item Response Theory
- **SOC 525** Practicum in Survey Research
- **ED PSYCH 579** Large-Scale Surveys in Education
Equipping Your Quant Skills - Courses

Quant Methods

ED PSYCH 508 Educational Statistics
ED PSYCH 512 Data Management and Visualization
ED RES 565 Quantitative Research
ED PSYCH 575 Multilevel Modeling
ED PSYCH 569 Multivariate Data Analysis
ED PSYCH 576 Factor Analytic Procedures
PREV SCI 510 Multilevel Modeling II
PREV SCI 512 Finite and Growth Mixture Modeling
PSYCH 516 Applied Structure Equation Modeling
PREV SCI 508 Longitudinal SEM
WSU COE Certificates

• Graduate Certificate in Applied Educational Research Methods
• Graduate Certificate in Applied Measurement and Quantitative Methods
Equipping Your Quant Skills – Training and Workshops

- APA Science Training Sessions
  https://www.apa.org/science/programs/training-sessions

- AERA Virtual Research Learning Center
  https://aera.elevate.commpartners.com/

- AERA PEERS Research Methods Series
  https://www.aera.net/Professional-Opportunities-Funding/Professional-Development-Courses/PEERS-Research-Methods-Series

- ICPSR Sources
  https://www.icpsr.umich.edu/web/pages/instructors/student-resources.html
Resources – Websites & Podcasts

https://quantitudepod.org/

https://stats.oarc.ucla.edu/

https://stats.oarc.ucla.edu/other/mult-pkg/whatstat/
Thank you!
Welcome
to the wonderful world of
Large-scale assessment and surveys!