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The objectives of this study were to assess:

- Internal structure of the BESS Student Form
- Measurement invariance
- Odds of elevated risk levels based on student demographics
Sample #1

- 273 randomly sampled elementary and middle school students
- 20 schools
- Collected as part of the Advancing Children’s and Teacher’s Success through Early Screening and Intervention study (U.S. Department of Education, R324B060005)
Sample #2

- 4,074 high school students
- Three high schools
  - All schools used for factor analysis
  - One school used for DIF analyses
- Collected as part of universal screening initiative in three high schools
Sample #3

- 1,857 high school students
- 4 schools
- Mid-sized city in the Southeastern United States
- Part of district-wide initiative
Research Question #1

Initial Question: Does initial evidence support the theorized four factor structure?

Analysis:

• EFA within CFA framework
• CFA
Research Question #1

Dowdy, Twyford, Chin, DiStefano, Kamphaus, and Mays (2011)
Follow Up Question: Does the factor structure found in Dowdy et al (2011) hold for older students?

Analysis:
• Confirmatory factor analysis
• Item analysis
Results from high school data:

### AIC and BIC Values for CFA Model Comparisons

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Size</th>
<th>Number of Factors</th>
<th>Deviance</th>
<th>Number of Parameters</th>
<th>AIC</th>
<th>BIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 2</td>
<td>4074</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>241262.1</td>
<td>91</td>
<td>241444.1</td>
<td>242018.5</td>
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<td></td>
</tr>
<tr>
<td>Four</td>
<td>235664.1</td>
<td>100</td>
<td>235864.1</td>
<td>236495.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample 3</td>
<td>1874</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>109403.8</td>
<td>91</td>
<td>109585.8</td>
<td>110160.2</td>
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<td></td>
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<tr>
<td>Four</td>
<td>106977.5</td>
<td>100</td>
<td>107177.5</td>
<td>107808.8</td>
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</tr>
</tbody>
</table>

### Reliabilities for Four Factor Structure

<table>
<thead>
<tr>
<th>Sample</th>
<th>Personal Adjustment</th>
<th>Hyperactivity/Inattention</th>
<th>Internalizing Problems</th>
<th>School Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 2</td>
<td>.791</td>
<td>.728</td>
<td>.842</td>
<td>.758</td>
</tr>
<tr>
<td>Sample 3</td>
<td>.788</td>
<td>.736</td>
<td>.832</td>
<td>.731</td>
</tr>
</tbody>
</table>
All 30 items had weighted and unweighted mean square fit statistics in between the limits listed as productive for measurement (.5 to 1.5; Linacre, 2004).
Do the items perform similarly across the two school districts? (measurement invariance)

Analysis:
• Rasch-based DIF analysis in IRTPRO
Research Question #2

Results:

• Chi-squared tests not significant for any of the 30 BESS items

• Evidence of measurement equivalence
Research Question #3

Is overall risk different across gender, ethnicity, free/reduced lunch status?

Analysis:

- Logistic regression
- Response variable: Elevated risk level vs. normal risk level
- Predictors: grade, gender, SES, race, location
### Research Question #3

<table>
<thead>
<tr>
<th>Variable</th>
<th>Wald Test Statistic</th>
<th>df</th>
<th>p-value</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td>8.861</td>
<td>1</td>
<td>.003</td>
<td>.904</td>
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<tr>
<td>Gender</td>
<td>2.318</td>
<td>1</td>
<td>.128</td>
<td>.877</td>
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<tr>
<td>Free Lunch Status</td>
<td>6.287</td>
<td>2</td>
<td>.043</td>
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<tr>
<td>Paid vs. Free</td>
<td></td>
<td></td>
<td></td>
<td>.654</td>
</tr>
<tr>
<td>Reduced vs. Free</td>
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<td></td>
<td></td>
<td>.791</td>
</tr>
<tr>
<td>Race</td>
<td>38.75</td>
<td>3</td>
<td>.000</td>
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</tr>
<tr>
<td>Black vs. Others</td>
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<td></td>
<td>1.065</td>
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<tr>
<td>Hispanic vs. Others</td>
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<td></td>
<td>1.004</td>
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<tr>
<td>White vs. Others</td>
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<td>2.629</td>
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<td>Location (LAUSD vs. Sample 3)</td>
<td>-0.134</td>
<td>1</td>
<td>.664</td>
<td>.874</td>
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</tbody>
</table>
Research supports

- Use of 4 factor structure for describing elements of risk
- Reporting ONLY the overall risk score
- Assumption of equality of measurement across school districts
- Possible difference in risk by ethnicity**
Assess measurement invariance across:

- Gender
- Ethnicity
- Grade level
- SES