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**Basics of Universal Screening**

Universal screening is an identification practice where all students in a targeted grade are administered an initial screening instrument. Scoring at or above a pre-determined cut-score on the screener leads to further consideration for placement and/or services in a gifted and talented program, usually involving at least one additional placement or confirmation assessment. The alternative to universal screening is often a referral process where parents or teachers recommend students for screening (or testing) for gifted services. Some research has suggested that a referral only process introduces bias into the identification process and may lead to less representative gifted programs.

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One challenge in using universal screening processes is deciding which assessment to use for screening, given the time and resources required to test all students. Another question is how to set cut-scores on the screening test to be inclusive enough to identify all students who could be successful while not overwhelming the program with excessive placement testing, which will require more time and resources to administer.

In this issue of Cognitively Speaking, we will address some of the logistical issues of how to select screening and placement tests effectively and what effect liberal (low) versus restrictive (high) screening test cut-scores will have on the number of students who meet the cut-score on the placement test.

**Data Background**

The data used in these analyses were gathered in a large, diverse school district in the southwest U.S. as part of a large-scale study in 2009. All the students took the complete CogAT® Form 6 and had two years of achievement test data. Therefore, we have the data on the “placement” test for all students in the study, allowing us to estimate the impact of the screening procedure.

We used data for Grades 3 to 6 including the CogAT 6 and mathematics, reading, and writing scores from the state’s 2009 and 2010 achievement tests. The CogAT 6 VQ (Verbal + Quantitative) composite was used as the placement test score, which is an average of the V and Q battery scores. The Nonverbal (N) Battery was treated as a highly correlated screening battery. Here’s a breakdown of the initial screener tests considered:

<table>
<thead>
<tr>
<th>Screener Test</th>
<th>Rationale</th>
<th>Relationship to Placement Test</th>
<th>Relative Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. CogAT Nonverbal Battery</td>
<td>Similar to CogAT screener—battery of three tests that predict larger (more diverse) battery</td>
<td>Strong (r≈0.8)</td>
<td>High</td>
</tr>
<tr>
<td>B. CogAT Figure Analogies Score</td>
<td>Fewer items, therefore less reliable than a full battery (A)</td>
<td>Medium (r≈0.6)</td>
<td>Low</td>
</tr>
<tr>
<td>C. State Mathematics Achievement Test</td>
<td>Achievement scores highly correlated to screener</td>
<td>Strong (r≈0.8)</td>
<td>High</td>
</tr>
<tr>
<td>D. State Reading</td>
<td>Similar to mathematics in terms of high correlation to screener</td>
<td>Strong (r≈0.8)</td>
<td>High</td>
</tr>
<tr>
<td>E. State Writing</td>
<td>Achievement score moderately correlated to screener</td>
<td>Weak (r≈0.5)</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**Findings**

**What impact does the correlation between screening and placement tests have on identification errors?**

Our first research question was: When considering all of the students who scored above a cut-score on the placement test, what proportion was identified or missed by the screening test? For these analyses, we consider two types of “errors” that can be made using the universal screening test. **False positive errors** mean that students meet the cutoff at the initial stage for the screener test but do not meet the cutoff on the placement test. This could be due to measurement error that affects one or both assessments as well as the use of a more lenient screener cut-score (more on this later). **False negative errors** mean that students do not meet the cutoff on the placement test, but would have scored above the cutoff on the placement test. In the case of a false negative, the student misses the opportunity to qualify for the program at the second step by being eliminated in the initial stage. This latter error is especially concerning.

Most false positives (FP) and false negatives (FN) came from Writing, which had the lowest correlation with the placement test. All of the other tests, which had stronger relationships to the placement test, had substantially lower false positive rates—i.e., students who met the cut-score on the screener test, but did not meet the higher cut-score on the placement test. Therefore, we can conclude that higher correlations between the screening and the placement test will reduce the costs of excessive placement testing.

The shorter tests (N and FA) had larger false negative rates than did the two full achievement batteries (math and reading). This meant that a lenient cut-score on an achievement test resulted in the fewest errors where students who would meet the cutoff on the placement test were excluded by the screening test.
What impact does the liberality of the cut-score have on identification errors?

Our second research question addressed whether setting a liberal (low) vs. a restrictive (high) cut-score on the screening test impacts the identification errors for the placement test. The results show that setting the cut-score for the screener to the same selectivity as the identification test substantially reduces the number of “false positives” (students who meet the cutoff on the screener, but not the placement test). However, this comes at the expense of a greater number of false negatives, where students who would be successful on the placement test were passed over by the screener. As we mentioned before, these false negative errors are more problematic because it means students are denied opportunities they could benefit from.

Implications for Practice

Researchers and practitioners have long been concerned with increasing the diversity and representation of gifted and talented programs. Research shows that referral-led identification processes may contribute to the problem of underrepresentation. Replacing a referral system with a universal screening policy is an important tool for addressing the underrepresentation of certain groups of students, particularly ethnic and racial minorities, low socioeconomic status (SES), and English learner students in gifted and talented programs. The results in this article show some specifics of how that universal screening process might be implemented by school districts.

Since the study reported in this analysis, CogAT Form 7 was developed and published. One important innovation for Form 7 was the creation of a CogAT Screening Form. This Screening Form consists of the three analogies subtests from the three domains of CogAT (verbal/picture analogies, number analogies, and figure analogies). The Screening Form takes less than one hour to administer and can be used in universal screening contexts as a brief screening assessment to identify students for further consideration. Additionally, the remaining six subtests can be administered to those selected in the initial universal screening step to provide full CogAT scores as the second-stage measure. Because of the design of the Screening Form, the correlations and reliability from Screening Form to the full CogAT will be comparable to the stronger screeners in our analyses.

What factors matter in a universal screening program?

Universal screening programs can vary substantially in their specifics, and these choices have consequences for the program. For example, administrators may seek to manage the number of “false positives” (students identified by the screening tool who do not meet the cutoff on the follow-up assessment) and “false negatives” (students missed by the initial screening tool who would have been successful). In many districts, false positives would increase the costs and other demands on the district to administer more placement tests. However, any effort to decrease false positives would also increase the number of false negatives and prevent eligible students from placing into the program. This trade-off is considerable: in our data 1–3% more students were missed by the screening test when higher cut-scores were used.

The chart below summarizes a few key points for designing universal screening programs:
Our results and analyses are based on one school district’s results. Educators should make evidence-based decisions, whether using the research literature or their own past experience with the program, to tweak their identification system. Local data should be used to determine how liberal to be in setting cut-scores for the initial screening to ensure that students who would be successful are identified for further testing, while not expanding the testing pool too greatly.

Cited Literature


Dr. Joni Lakin is an Associate Professor of Educational Foundations, Leadership, and Technology at Auburn University. She worked on Form 7 and has joined the team as a contributor for the next edition of CogAT.

Victoria Driver is the Senior Product Manager at Houghton Mifflin Harcourt® for CogAT. She has worked in assessments, education, and research at HMH® for over 10 years.

If you have questions, please contact your Houghton Mifflin Harcourt Assessment Account Executive or call HMH Customer Experience at 800.323.9540. You can also visit CogAT.com for more information.