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Universal Screening in Gifted and Talented Identification: Implementation and Overcoming Challenges

By Dr. Joni Lakin and Victoria Driver

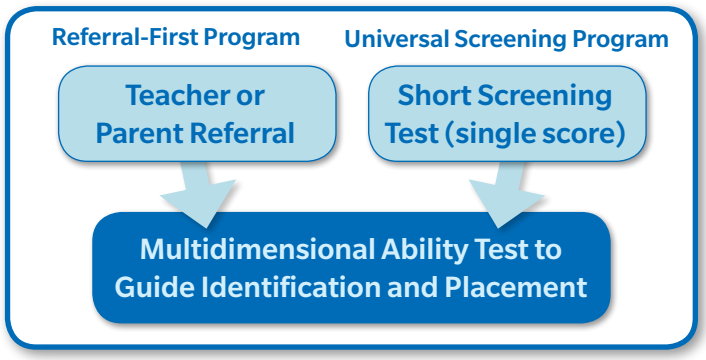
We've been excited to see gifted and talented education in so many popular press articles in recent months. One of the motivators of this surge in interest seems to be a series of research reports by economists, including Card and Giuliano's 2015 paper *"Can universal screening increase the representation of low income and minority students in gifted education?"* Dr. Lakin was fortunate to be asked to contribute to a special issue of the *Journal of Advanced Academics* where she and Dr. Matthew McBee wrote independent reviews of this paper translated for the gifted research field.

In the original study, Card and Giuliano took advantage of a "natural experiment" where they were able to compare program diversity in a school district that moved from an identification process initiated by teacher or parent referral to a new process that began with every second grade student completing a screening assessment. This is called universal screening. The researchers were interested in the proportion of historically underrepresented minorities (such as English learners, Hispanic students, and African-American students) identified with the new program.

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.

The key finding of their study was that the universal screening system was **more effective** than the previous teacher and parent referral system in addressing the underidentification of African-American, Hispanic, female, low socioeconomic status, and English learner students. Another important finding was that using universal screening greatly increased the number of students referred overall in the first screening stage and therefore requiring the second stage placement test to be identified for services. Because the district in the study used individually administered intelligence tests for placement, this led to substantial resource demands.



Universal screening was more effective than the previous referral system in addressing under-identification.

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:

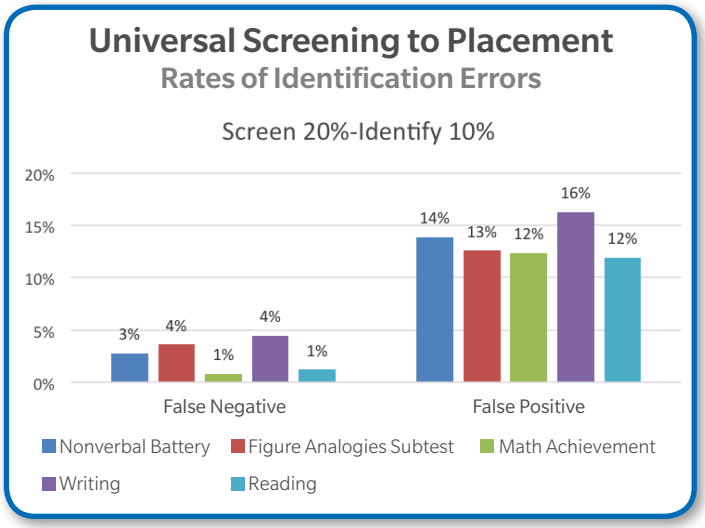
Screener Test	Rationale	Relationship to Placement Test	Relative Reliability
A. *CogAT* Nonverbal Battery	Similar to ***CogAT*** Screener—battery of three tests that predict larger (more diverse) battery	Strong (r≈0.8)	High
B. *CogAT* Figure Analogies Score (normalized by grade)	Fewer items, therefore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

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.



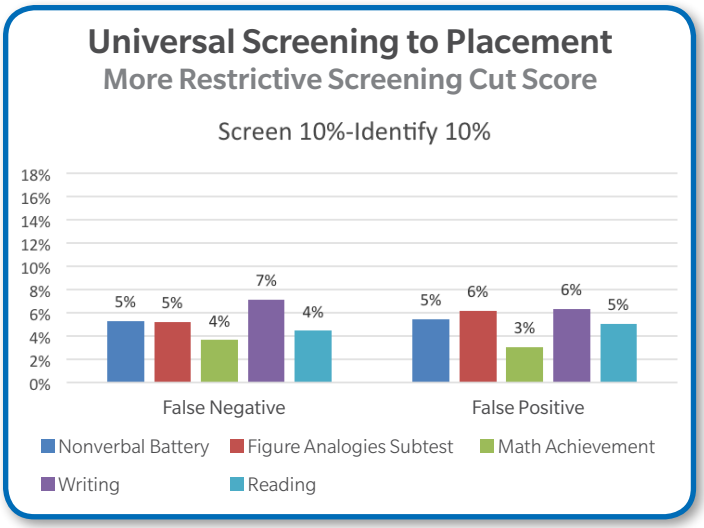
Most false positives (FP) and false negatives (FN) came from Writing, which had the lowest correlation with the placement test. All of the other tests, which had stronger relationships to the placement test, had substantially lower false positive rates—i.e., students who met the cut-score on the screener 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.

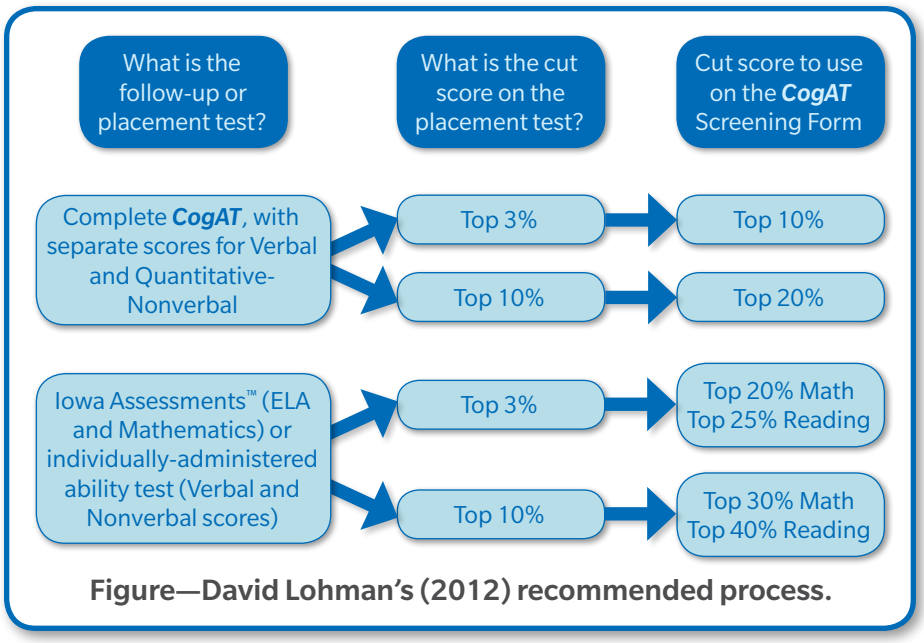
Since the study reported in this analysis, ***CogAT*** Form 7 was developed and published. One important innovation for Form 7 was the creation of a ***CogAT*** Screening Form. This Screening Form consists of the three analogies subtests from the three domains of ***CogAT*** (verbal/picture analogies, 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 a few key points for designing universal screening programs:

Key point	Rationale
Cut-score on screening test	Decreasing the cut-score (to be more lenient) may increase program diversity, but will increase the number of students initially selected for further evaluation.
Cut-score on placement/ confirmation test	More accurate screening was obtained by setting a relatively liberal cut-score on the screening test and a more restrictive cut-score on the placement test.
Relationship between screening and placement battery	In addition to the cut-score used, the correlation between the screener and placement assessment, as well as the reliability of both instruments and their relevance to the target program, will also impact the number of both false positive and false negative errors in the identification process.

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.



Figure—David Lohman's (2012) recommended process.

Cited Literature

Card, D., & Giuliano, L. (2015). *Can universal screening increase the representation of low income and minority students in gifted education?* National Bureau of Economic Research. Retrieved from http://www.nber.org/papers/w21519

Lakin, J. (2016). Universal Screening and the Representation of Historically Underrepresented Minority Students in Gifted Education: Minding the Gaps in Card and Giuliano's Research. *Journal of Advanced Academics*, 27(2), 139-149.

Lohman, D. F. (2012b). Decision strategies. In S. L. Hunsaker (Ed.), Identification: *The Theory and Practice of Identifying Students for Gifted and Talented Education Services*. (pp. 217-248). Mansfield Center, CT: Creative Learning Press.

McBee, M.T. (2016). What You Don't Look For, You Won't Find: A Commentary on Card and Giuliano's Examination of Universal Screening. *Journal of Advanced Academics*, 27(2), 131-138.

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