Cognitively SPEAKING

CogAT® The Essentials: Using Ability Tests in Gifted and Talented Identification Programs

The ***Cognitive Abilities Test***™ (***CogAT***®) Form 7 introduced many exciting new features such as a revised Primary Battery and new quantitative item formats. In this edition of *Cognitively Speaking*, we will cover key issues and strategies in the use of ability tests such as ***CogAT*** Form 7 for gifted and talented identification. Additional details about these topics may be found in the ***CogAT*** Form 7 Score Interpretation Guide as well as the Research and Development Guide. These resources offer comprehensive information on these topics.

Using Composites and Ability Profiles

CogAT includes three reasoning batteries—verbal, quantitative, and nonverbal. Thus, one of ***CogAT***'s major benefits is that it provides multiple vantage points from which to consider students' cognitive strengths and weaknesses. Rather than rely solely on a composite or total score, ***CogAT*** results are most useful when different battery scores are considered.

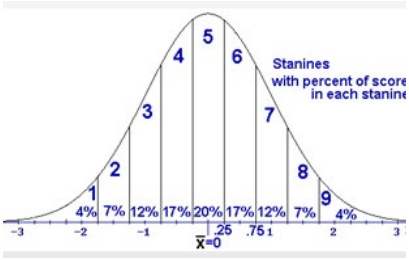
Student performance on the Verbal, Quantitative, and Nonverbal Batteries are reported on the same score scales as the composite total, including percentile ranks and scale scores, so that they may be interpreted independently. However, ability profiles are another useful way of interpreting the battery results. ***CogAT* ability profiles** consist of three parts: the median stanine across batteries; the shape of the profile; and, when applicable, the relative strengths or weaknesses demonstrated. See the inset to the right for two example profiles.

Examples of Student Profiles

A student with a profile of **8B(Q-)** has fairly high scores overall. The median stanine is 8, which is in the top 11% nationally, but this student has a relative weakness in quantitative reasoning. This is a student who will excel in tasks that require verbal or possibly figural demands, but will have more difficulty on quantitatively demanding tasks. This student may need more support to excel in math.

Another student has a **4E (V+ N-)** profile. This student performed below the national average on at least two batteries (the 4th stanine is below average), but with an E (extreme) profile, we probably need to look at each of the battery scores independently to better understand the profile. The composite score stanine won't be as meaningful as individual battery scores. In this case, this student seems to have a strong relative strength in verbal reasoning, which might be leveraged to support learning in quantitative and other domains where there may be a weakness. It's also possible there was a problem with testing when the batteries vary so widely. These profiles are unusual. See Lohman, Gambrell, & Lakin, 2008, for an extended look into these extreme profiles.

The median stanine gives you a general sense of a student's overall performance. Stanines are a way of representing the normal distribution with a single numeric value from 1 to 9, where 1 is the lowest value and 9 is the highest. A stanine of 8 means the student is in the top 11% of scores and a stanine of 9 means they are in the top 4% on the composite score.



Next is the profile shape—this is a letter code. The profile shape is a simple way of representing the degree of students' relative strengths and weaknesses. The different codes are:

A = Battery scores about the s**A**me

B = One score a**B**ove or **B**elow the others

C = One score far above and one score below creating a **C**ontrast

E = **E**xtreme difference in battery performance

Finally, we have the student's relative strengths and weaknesses. These indicate which batteries are considerably different from the others (+/- indicates far above or far below). **A** profiles do not include relative strengths or weaknesses because the **A** profile indicates performance is consistent across batteries.

Why Do Profiles Matter? Using the Teacher's Guide for Differentiating Instruction

Some gifted and talented programs focus on the single composite score for identification purposes. However, this neglects much of the value of the ***CogAT*** score report. Not only can the three battery scores be used for different, more flexible identification approaches (Lohman, 2009), but they can also be used to differentiate and enrich instruction in the regular, mixed-ability classroom.

The *Score Interpretation Guide* and *The Short Guide for Teachers* include rich information about how to differentiate instruction for students to build on strengths while using appropriate scaffolding to shore up weaker areas. These guides provide instructional suggestions for all profile levels (Stanines 1–9) as well as all areas of strength or weakness (verbal, quantative, or nonverbal). Teachers will find this information very valuable for taking reasoning skills into consideration in classroom instruction. See the inset for examples of relative strengths.

Examples of suggestions to build from relative strengths:

Strength	Example Adaptions
V+	Avoid pitfalls in math: Students with relatively strong verbal abilities often ***find it easier to memorize formulas than to build more abstract conceptual systems***. These abstract systems lead to the ability to transfer mathematical knowledge to unfamiliar domains.
Q+	Provide opportunities for these students to **contribute at high levels to group projects** that require math skills. Group projects provide an avenue for building better verbal and spatial reasoning abilities.
N+	**Encourage students to create drawings when solving problems in mathematics**, concept maps when taking notes, or mental models of a scene when reading a text.

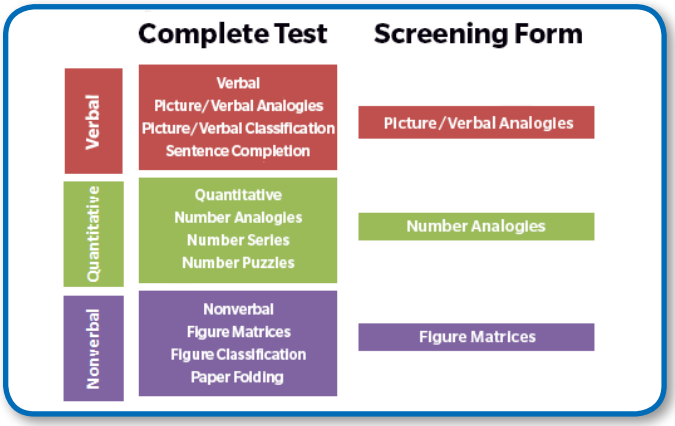
Using *CogAT* in Gifted and Talented Screening Systems

Many complicated issues arise in establishing an assessment system for gifted & talented identification programs. Educators should refer to the full Score Interpretation Guide in this process as well as reviewing current research in the field, but following are a few considerations.

First, the program must clearly understand **what services they offer and what aptitudes they are seeking to develop in students**. A program targeting students with potential for high achievement in math (for example, an accelerated class) will have different identification needs from a program targeting students with already strong achievement in math (for example, an advanced math placement) or a general program targeting all academic areas. In these examples, the first program could base selection on math ability and motivation measures whereas the second program might put more emphasis on math achievement scores in addition to ability and motivation. The third program would consider talent and motivation in all relevant academic domains.

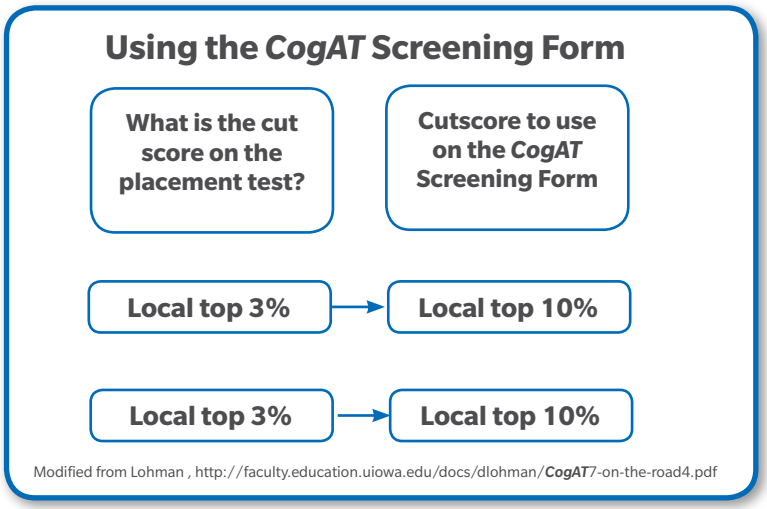
A second important consideration is how to maximize fairness and diversity in identification. A key strategy here is **casting a broad net in initial screening** for talent. Relying on teacher or parent nominations of students for screening can lead to over-identification of students who fit stereotypes of gifted children and may overlook other talented students who present their talents in non-traditional ways. Giving the full student population a chance to demonstrate their talents can avoid this issue. This can be accomplished by administering a brief screening assessment to all students in a targeted grade. The screening assessments (depending on the program) might include ability tests and motivation or interest rating forms completed by teachers. Screening tests for ability are usually faster, but less reliable, than full ability tests. Therefore, once promising students are identified with the screening test, a full test battery is needed to more reliably identify the students with the most academic potential. This more extensive battery can be administered to the top performers among the screened students. Additional measures, such a creativity tasks or interest inventories, might also be used at the placement testing phase in addition to the full placement test (Lohman & Renzulli, 2007).

CogAT 7 offers a Screening Form comprised of three subtests from the full test. It takes about 30 minutes. The following figure shows how the ***CogAT*** Screening Form relates to the full test.



When setting cut scores for initial identification based on a screening test, it is important to set a relatively low cut score so that capable students are not screened out too soon. The following figure indicates how setting local cut scores and using the ***CogAT*** Screening Form work together. Screening tests must identify a relatively large pool of talent, which can then be further evaluated for special instruction (initially indicating 2–3 times as many students as there is room for in the program).

As you may have discerned in the previous paragraphs, we strongly recommend that schools use **multiple sources of information** in identifying students in need of enrichment services. Measures of ability, achievement, and "non-cognitive" traits (including motivation or perseverance, interest, and creativity) should all inform placement and instructional decisions for gifted and talented students. These measures must be as reliable and valid as possible for the decisions being made. For measuring ability, this means using ability



tests that broadly measure cognitive ability in alignment with the modern, multidimensional theory of ability (Lohman & Lakin, 2011; McGrew, 2006). For non-cognitive traits, it is important to use trained raters and behaviorally anchored checklists. Behaviorally anchored checklists clearly define traits in terms of student behaviors rather than general impressions. When used by trained raters, these checklists will avoid some common biases in rating scales, such as the "halo effect," where a student who is well-behaved, personable, or talented in one way is attributed with all positive traits regardless of actual behavior. Training can also help raters identify students who present their talents in non-traditional ways, such as English learner students who present their verbal talents differently from native speakers.

Using Cut Scores in Selection

Another consideration, one that can be heavily scrutinized, is **setting the cut scores** used to place students in programs. Recall that the purpose of talent development programs is to provide instruction that is appropriately challenging to all students. Sometimes providing appropriate challenge means the use of in-class ability grouping, between-class ability grouping, or pull-out programs for students with very different academic needs from their peers.

The need to provide different academic challenges from students' peers leads us to an important consideration in setting policies of selection for talent development programs. That is, policies for identification must consider the local student population and school context. It must also consider how many students a given program can reasonably serve. Widely used guidelines (and sometimes state policies) are based on arbitrary cut scores (for example, an IQ scale score of 130 or a national percentile ranking of 95%). This is a problem because in some school districts these arbitrary cutoffs lead to many more identified students than can be reasonable served—creating a program that includes students that could be reasonably served in the regular classroom. In other districts, these same cutoffs would lead to few students being identified as needing special challenge, which would leave many students in the regular classroom who need more academic challenge than their classmates. Based on this understanding of providing appropriate challenge, we recommend that identification should be based on locally determined cut scores or local norms.

We've heard stories from schools that made much needed changes to their identification systems in order to promote diversity and better serve their school district. In one district, the initial result was a flurry of angry letters from parents who felt they were told their student was "no longer gifted." Needless to say, the administrator was overwhelmed with the process at first. Effective communication with parents can help overcome common misconceptions about giftedness and concerns about the process.

Flexibility in Identification and Services

Selecting students for access to specialized instruction or enrichment programs is a common and important use of ***CogAT*** scores. Access to such programs is highly prized by many parents and, therefore, this identification process can be fraught with contention.

Parents prize labels like "gifted" for their students, but labels are generally not very helpful for educators who need a more nuanced understanding of the goals of gifted and talented programs. A good way to talk about such programs is in terms of "talent development" and targeted enrichment, rather than framing it as "identification" with the end result of a label of "gifted" or "not gifted." As we can see from the ***CogAT*** score profiles, all students have areas of strengths and weaknesses that can be developed by effective teaching. When talking about gifted and talented education with teachers and parents, consider framing the decision in terms of talent identification and development rather than deciding whether a student is or is not "gifted." This approach is especially helpful when the goal is to increase the diversity of students served by the program and when students are eligible to be transitioned into and out of these services over time.

Despite common belief, cognitive ability is not fixed, but consists of developed skills, which may change, grow, and adapt over a lifetime. Just like height, students vary in the pace at which their cognitive abilities develop—sometimes jumping ahead and sometimes falling a bit behind their peers. These changes in performance relative to peers mean that students who need enriched instruction in early grades may not show exceptional performance or ability in later grades. Other students will suddenly start to show exceptional ability in later grades; this is especially common for former English learners and students whose family cannot provide an enriched pre-K education. Just like height, the earlier measurement was not necessarily wrong; it represents a characteristic that is developing at different rates for different students (Lohman & Korb, 2006).

In response to these realities of gifted and talented development, Renzulli and colleagues (Renzulli, 1990; Renzulli, Reis, & Smith, 1981) proposed the idea of a "revolving door" in identification where schools recognize that students' needs change over time and allow students to frequently and flexibly enter and leave talent development programs. Frequent re-screening and reevaluation of students' instructional needs is key to maximizing the effectiveness of a gifted and talented development program.

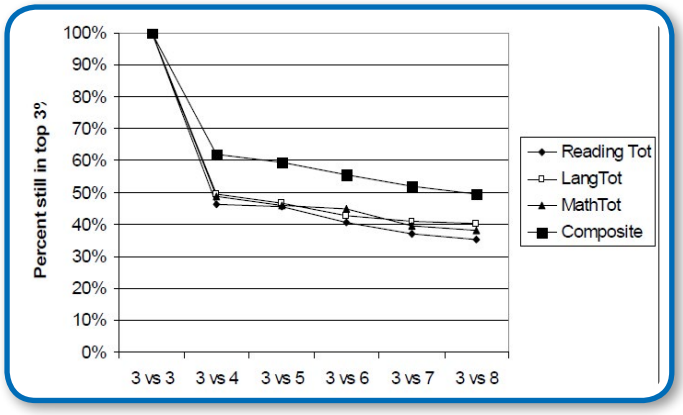
Common Questions about Test Score Use

When Is an Ability Score Too Old to Use?

We know that schools need to maximize their efficiency (both in terms of resources and time) when it comes to testing. So it is no surprise that educators have expressed interest in using test scores from previous grades to make decisions in later years (even 4–5 years later).

Using ability test scores that are more than a year old is probably not a good idea for a couple of reasons. Most importantly, as we mentioned before, cognitive ability is not fixed, and develops at different rates for different students. Again, just like height, students vary in the trajectory of their growth in cognitive abilities.

These changes in performance relative to peers as well as normal, random fluctuations in test performance due to measurement error lead to sometimes substantial changes in students' performance from year to year. Again, the earlier measurement was not necessarily wrong; it is just a characteristic that is developing at different rates for different students. Lohman and Korb (2006) looked at these fluctuations and created the following figure that shows how students with exceptional early achievement scores on the *Iowa Assessments*™ fared in later grades:



They found that just 60% of the same students were identified as top 3% in both Grade 3 and Grade 4, and the number drops further up to Grade 8. These results are more extreme because the sample was limited to students in the top 3%, which means that regression to the mean will lower these scores considerably when students are retested. However, this effect of changing relative performance across grades will affect all high-scoring

students. The cross-grade correlations confirm that test-retest correlations are strongest at one year and diminish somewhat after that (see the *Research and Development Guide* for detailed correlation tables).

Based on this research, using scores that are more than a year old for identification or classification purposes is likely problematic. It's a good idea to retest each time new placement decisions need to be made. It is also a great idea to regularly re-screen the full school population for students who need special academic challenge, but did not show that need at the earlier assessment opportunity. The age of the student is important, too. For students testing in grades K, 1, or 2, it is especially important that scores be recent. Young students grow and change at an accelerated rate relative to older students.

Additionally, environmental variables, such as opportunity to learn and family resources, affect students in the early grades more so than older students. Therefore, a student's score from Grade K or 1 is likely no longer valid to make programming decisions for Grade 3. Finally, the higher the cut score (e.g., 1% or 3%), the more important it is to retest on a regular basis. The previously mentioned regression to the mean and measurement error will affect student rankings more for high cut scores. As a result, when cut scores are strictly imposed, students need adequate opportunities to demonstrate their eligibility for inclusion in the selected group.

How Long Do I Need to Wait Before Retesting a Student?

Practice effects from retesting are usually modest, but may be meaningful for some students and lead to an unfair advantage compared to students without practice opportunities due to retesting. Nonverbal tests are particularly sensitive to practice. On the same test items, re-testing within a few weeks or months could lead to gains of 5 to 10 SAS points. We recommend an interval of no less than 3 months, and ideally 6 months, before retesting with the same test form and level.

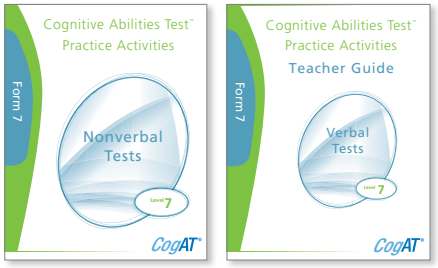
Practice effects are largest, of course, when identical test forms are used. One solution for a faster test-retest is to use a different level of the ***CogAT*** at retest. The design of the new Form 7 means that no more than 50% of items will be repeated from one level to the next (i.e., from level 9 to level 10). Whether to go up or down a level for retest depends on the student. For primary level students (Grades K–2), you will want to use another primary level test. For the upper levels, you may want to go up a level if the student is high performing and down a level if they were low performing on the initial test. The vertical scale used by ***CogAT*** facilitates direct comparisons across test levels. Additionally, adjoining test levels allow plenty of room for students to demonstrate exceptional ability. A first grade student can reach the 99th percentile on levels 5/6, 7, or 8.

Should I Help My Students Prepare to Take CogAT?

Scores on educational assessments are most valid when students clearly understand what they are supposed to do. For relatively novel tests, like ***CogAT***, this knowledge of how to engage with test items and strategies for attempting items can vary greatly across students. Unequal preparation for tests can occur by accident (being in another school that uses ***CogAT***) or by well-meaning parents who access practice materials and full practice tests. Unfortunately, prior practice with the test is often associated with higher socioeconomic status, which can lead to unfair outcomes for students and reduced diversity in selected students.

To level the playing field for all students and yield the most useful test results, schools can use free practice materials provided for the ***CogAT*** to prepare their students. Based on prior research, we know that appropriate test practice must go beyond simply reading the test directions and provide an opportunity to attempt real items with feedback. The ***CogAT*** practice materials provide a structure to do this while also potentially teaching important reasoning skills.

Practice materials are available for all batteries and levels 5/6 through 12+. The practice materials come with student practice booklets and a Teacher Guide. The Teacher Guide is designed to provide helpful strategies for attempting ***CogAT*** items.



For example, the Teacher Guide gives the following hints on helping students be more successful (and systematic) when attempting a Figure Matrices question on ***CogAT*** Form 7 Teacher Guide:

When practicing the Figure Matrices questions, encourage students to use these stratiegies.

- Carefully examine the first two figures. Then think of a rule (and say is silently) that describes the relationship between the figures. For example, flip the first figure to get the second one.
- Apply the rule to the third figure to determine the missing figure.
- Test the rule on each answer picture, eliminating answer pictures that do not fit the rule.

Students at this level tend to make the following mistakes:

- Students may choose an answer picture that looks like the figure in the bottom row. For example, in the sample question above, students might select the first answer choice.
- Students may overlook or forget a critical feature of the figures in the top row. Using language to describe the rules will help them remember them.
- Students might select an answer choice before checking all the answer pictures.

Summary

We hope you found this Essentials guide helpful in planning or reviewing your use of ability tests in gifted and talented identification programs. We'll continue to cover fundamental concepts and advanced topics in future editions of *Cognitively Speaking*. Don't forget that you can access prior editions of this newsletter that cover important issues such as promoting diversity when selecting students, misconceptions about cognitive ability traits, and comparisons of scores across different ability tests. Visit **CogAT.com** to browse through past newsletters.

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