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This edition of *Cognitively Speaking* discusses how to identify academically gifted minority students. The text is condensed from an article by Dr. David Lohman. To access the original article, go to [www.cogat.com](http://www.cogat.com) and click on “Copies of Recent Papers by Dr. F. David Lohman.” Then, scroll down until you reach “An Aptitude Perspective on Talent: Implications for Identification of Academically Gifted Minority Students.”

## HOW TO IDENTIFY ACADEMICALLY GIFTED MINORITY STUDENTS

by Dr. David Lohman, The University of Iowa

Programs for academically gifted students face difficult challenges. Recent federal legislation focuses attention on students who have not achieved state standards. Students who excel may be ignored as schools strive to meet the goal of Adequate Yearly Progress. Resources previously earmarked for gifted students may be curtailed. At the same time, schools face increased pressure to identify additional gifted students from underrepresented minority groups. On the one hand, resources are shrinking; on the other hand, schools are required to identify more students.

How can we reconcile these conflicting goals? The first step is to distinguish between two different groups of students: *high-accomplishment students* who exhibit excellence in a particular academic domain and *high-potential students* who demonstrate potential for excellence in the target domain. High-accomplishment students are easier to identify and easier to place in the appropriate instructional environment. For most, this involves some form of academic acceleration (Colangelo, Assouline, & Gross, 2004). Potential for academic excellence is much harder to identify,

and, once identified, is more difficult to develop. Many talented minority students fall in the high-potential group because they have not had opportunities to develop academic excellence. High-potential students typically require different programs than high-accomplishment students. Both groups need instruction geared to their current levels of accomplishment and to the learning characteristics that will enhance or impede their success.

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## Academic Potential as Academic Aptitude

Of the many characteristics that influence a person's behavior, only a few aid goal attainment in a particular situation. These are called aptitudes. *Formally, aptitude is the degree of readiness to learn and perform well in a particular situation* (Corno et al., 2002). Examples of aptitudes for learning from instruction include abilities to comprehend and follow directions, to manage one's time wisely, to apply previously acquired knowledge, to make good inferences and generalizations, and to manage one's emotions. Characteristics that hinder performance function as *inaptitudes*. Examples are impulsivity, high levels of anxiety, and prior learning that interferes with new learning. Different ways of organizing instruction make different demands on students and thus require different mixes of aptitudes.

As this list demonstrates, aptitude is by no means fixed at birth. Achievements also function as aptitudes, as when reading skills enable new learning from texts. Indeed, aptitudes typically encompass more than ability and achievement and include motivation, persistence, interest, temperament, and personality.

## Measuring Aptitude

Understanding which characteristics are likely to function as aptitudes for acquiring a skill or performing a task begins with a careful examination of the demands of the skill and the contexts in which it must be acquired or performed. Defining the situation, or context, is part of defining the aptitude. *Unless we define the context clearly, we are left with measures that capture only some of the aptitudes needed for success* (Snow & Lohman, 1984). For example, one would measure different characteristics when identifying athletes who are likely to excel at ballet versus those likely to excel at basketball. A measure of general physical fitness would be a poor substitute for more focused assessments.

There are two ways in which we commonly infer aptitude. In the first, we identify tasks that require similar cognitive processes. Then, we measure the student's competence on those tasks (Carroll, 1974). For example, phonemic awareness skills that facilitate early reading in Spanish also facilitate early reading in English. If we measure Spanish-speaking students' phonemic awareness skills in Spanish, we can estimate the facility with which they will learn to read English (Lindsey, Manis, & Bailey, 2003). A second way to infer aptitude is from the speed with which students learn new tasks. For example, we infer aptitude when a particular student learns something from a few exposures that others learn only after much practice.

## Long-term Predictions

Typically, *the best predictor of future performance in any discipline is past performance on similar tasks.* We can infer aptitude for future learning in a domain based on the efficiency of past learning in that domain. Therefore, when making short-term decisions, rely primarily on current achievement and offer instruction commensurate with the student's current accomplishments. However, additional aptitudes enter the picture with each step one takes into the future. In most disciplines, continued improvement requires interest, persistence, and a new mix of abilities. For example, algebra demands skills not needed in arithmetic. Critical reading necessitates skills not used in beginning reading. Teachers, teaching methods, and classroom dynamics change as one progresses through school. Therefore, prior achievement is not the only factor to consider when making long-term academic predictions.

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The second most important learner characteristic in the attainment of academic excellence is the ability to reason well in the symbol system(s) used to communicate knowledge in a discipline. Academic learning relies heavily on reasoning with words and quantitative symbols. These are the critical reasoning abilities for both minority and majority students. Nonverbal (figural) reasoning abilities are less important and show lower correlations with school achievement (Lohman, in press; Thorndike & Hagen, 1987, 1997).

Therefore, if the goal is to identify those students who are most likely to show high levels of future achievement, both current achievement and domain-specific reasoning abilities need to be considered. However, prior achievement is more important when new learning will be like the learning sampled by the achievement test. With longer time intervals or when the content changes abruptly, as from arithmetic to algebra, reasoning abilities become more important

(Lohman & Korb, 2004; Rock, Centra, & Linn, 1970). Because children are universal novices, it is more important to assess reasoning abilities when identifying academic giftedness in young children, whereas it is more important to assess domain-specific accomplishments when identifying giftedness in adolescents. For all students, however, the critical issue is the identification of the aptitudes needed for success and of the inaptitudes that can thwart success.

### Predicting Achievement for Minority Students

Some schools use nonverbal tests to identify academically gifted minority students. The assumption is that a nonverbal test better measures the student's ability to learn than a test that uses words or numbers. But is the ability to reason in English less predictive of future achievement for minority students than for majority students? Research that addresses this question shows clearly that the predictors of achievement in reading, mathematics, social studies, and science are the same for White, Black, Hispanic, and Asian-American students (Keith, 1999; Lohman, in press). For example, of the three *CogAT* batteries, the Verbal Battery is the strongest predictor of reading comprehension for both White and Hispanic students, while the Nonverbal Battery contributes least. Some students with high *CogAT* Nonverbal Battery scores are actually *less* likely than other students with similar levels of verbal and quantitative abilities to achieve well in school (see Lohman, in press).

This makes sense from the perspective of aptitude theory. Success in school places heavy demands on students' abilities to use language to express their ideas and to understand others. Therefore, *the students most likely to succeed in formal schooling in any culture are the ones who are most able to reason verbally*. Indeed, verbal reasoning abilities are even *more* important for bilingual students



than for monolingual students. Thus, an aptitude perspective leads one to look for students who have developed the specific cognitive (and affective) aptitudes most necessary for acquiring expertise in particular domains. But how can one do this in a way that is fair to all?

### Assumptions about Growth

*Inferences about aptitude are defensible only if students have had similar opportunities to acquire the knowledge and skills measured by a test.* For example, comparisons of students in the same grade presume that (a) their pattern of school attendance is approximately the same, (b) the test and instructional content are aligned, and (c) the students' out-of-school experiences that impact school achievement have been similar. Comparisons with age peers presume that their general exposure to and participation in the culture sampled by the test approximates that of other students who are the same age. These assumptions are questionable for many students and especially for minority students.

Predictions about future performance assume that a student's rank within the norm group will remain relatively constant over time. This is unlikely if the student's experiences differ from the norm. Over time, students with initially high scores can fall behind by improving at slower rates than their peers. Those with initially lower scores can show substantial improvement if the causes of their poor performance can be identified and addressed. Overcoming an initial deficit or improving at the same rate as other high-scoring students is not easy. The attainment of academic excellence comes only after much practice and training. It requires the same level of commitment on the part of students, their families, and their schools as does the development of high levels of competence in athletics, music, or other disciplines of nontrivial complexity.

## The Fallacy of Common Cut Scores

Although measures of accomplishment should be compared to common standards, measures of potential (i.e., aptitude) are most informative when students are compared to others who have had similar opportunities to develop the aptitudes measured. The desire to use a common cut score for all measures when making decisions about the need for special educational services not only appeals to the laudable desire to be fair but also simplifies the identification process. However, the negative consequences of this policy far outweigh its benefits. Some of the harmful effects follow.

1. The use of a common cut score reinforces the tendency to interpret tests as measuring innate abilities. If test scores depend on background and education, then one must take these factors into account when interpreting the scores. The alternative—to interpret test scores as measures of innate abilities largely unaffected by such factors—avoids these complications. Thus, *the decision to use a common cut score on an aptitude test encourages the naïve but false belief that ability tests measure innate rather than developed abilities.*

2. The use of a common test with a common cut score encourages the use of less reliable tests. The smaller the difference between groups on the selection test, the greater the proportion of lower-scoring students who will be selected using a common cut score. In general, group differences will be smaller on less reliable tests than on more reliable tests. In the extreme, a completely unreliable test will show no differences between groups, even when true differences are large. Therefore, *evaluating tests by the extent to which they achieve the goal of proportional representation tends to favor shorter and less reliable tests over longer and more reliable tests.*

3. The use of a common test with a common cut score encourages the use of less valid tests. In general, when achievement differences between groups are large, differences will also be large on valid scholastic aptitude tests. Tests that are less predictive are more likely to show smaller group differences. For example, nonverbal ability tests show smaller differences between English language learners and native speakers than verbal reasoning tests show. However, nonverbal ability tests are much poorer predictors of school achievement than verbal tests. *Using less valid tests and a common cut score, one identifies more minority students but fewer of the minority students who have the aptitude to succeed.* This should be a concern to all, especially to minority communities who rely on the schools to develop their most talented students as their next generation of scholars and professionals.

*A better policy would be to make decisions about potential using the most valid and reliable aptitude tests and to compare each student's scores to those of others who share similar learning opportunities or background characteristics.* In other words, identification of aptitude should be made within groups who have had similar opportunities to learn the knowledge and develop the skills being measured. Importantly, groups need not be composed entirely of students from the same minority group.

For example, one can compare the performance of students who speak a language other than English at home but who have had a similar amount of exposure to English. Those who balk at this suggestion might consider how frequently we shift among different norm groups when making evaluations about giftedness.

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## The Importance of the Norm Group

Giftedness is a relative, not an absolute, concept. Whether a particular score is considered unusual depends on the norm group. For example, on the *Iowa Tests of Basic Skills® (ITBS®)*, a reading score that falls at the 90th percentile rank (PR) using fall norms converts to the 81st PR if midyear norms are used. Similarly, if one compares a student's score on an intelligence test to the score the student would obtain if a few months older or younger, the IQ easily fluctuates ten points. Or if one uses 1965 norms rather than 2000 norms (for either an ability or an achievement test), the examinee's rank changes markedly. Most importantly, a score that is unusual in one school may be commonplace in another. For example, the *ITBS* reading score that is at the 90th PR nationally is actually at the mean in about 5 percent of the classes in the nation. Indeed, for most educational programming the critical issue is the relative difference between a particular student's performance and that of other local students. Decisions about accelerated study are best made on the basis of local norms. Many test publishers offer these norms when a school or a district tests all students in a grade.

Test publishers do not report separate norms for different ethnic groups. There are many reasons for this, not the least of which are the difficulties obtaining truly representative samples and interpreting scores. Achievement is best compared to a common set of standards. It makes little sense to set different standards for different groups when all live in a common world. Nonetheless, inferences about the ability to learn that are commonly made from ability tests presume that examinees have had similar opportunities to acquire the knowledge and skills sampled by the test. The issue is particularly important when schools use test scores to identify minority students who do not currently achieve at an exceptional level but who could develop academic excellence if given additional assistance. It is best to



compare the student's scores on the aptitude test to those of other students who have had similar opportunities to develop the skills measured by the test.

## Suggestions for Policy

How can educators implement a policy consistent with these principles? Some suggestions follow.

**1.** Assess the available educational treatment options. *Understanding the cognitive and affective requirements of existing programs is the first step in understanding the personal characteristics that function as aptitudes and inaptitudes for participants of the program.* For example, will students receive accelerated instruction with age mates, or will they be grouped with older students?

Will the program require much independent learning, or will students work in groups? Will instruction build on students' interests, or is the curriculum decided in advance?

**2.** Decide the extent to which selection will be based on evidence of accomplishment or potential for accomplishment.

*In general, emphasize accomplishment when identifying older students and adolescents who are academically gifted. Emphasize potential when identifying younger students and those who have not had opportunities to attain expertise.*

**3.** Obtain the most reliable and valid measures of domain-specific aptitude for all students. As much as possible, match the aptitudes measured to the types of instruction offered. Avoid basing selection on composite scores, especially for older students. Rather, *obtain measures of (a) domain-specific achievement; (b) the student's ability to reason in the symbol systems required by the academic program; (c) the student's interest in the domain studied in the program; and (d) persistence under similar instructional conditions.* The first two aptitudes can be measured reasonably well. The last two require more judgment. When measuring aptitude, assess

students relative to peers who have had similar backgrounds and learning opportunities.

4. Establish policies for achieving more equitable representation of minority students in programs. Discuss the difference between the need for common standards in the measurement of achievement and the need for within-group standards for the measurement of aptitude.

*Consider grouping students by opportunity to learn and selecting the highest-scoring students within groups.* For example, group students by English

proficiency: native speakers of English, bilingual but strong proficiency in English, or bilingual but less proficient in English.

Students within groups need not be equivalent for the grouping to be effective. However, make instructional placements primarily on the basis of accomplishment to date. Keep in mind that for some

children instruction offered by programs for the gifted supplements what their families provide; for others it provides the students' only opportunity to develop superior academic skills.

5. Make better use of local norms when identifying students whose accomplishments in particular academic domains are well above those of their classmates. For example, on norm-referenced achievement tests, look at local percentile ranks for particular domains such as mathematics or science rather than at national percentile ranks for composite scores. Provide instruction that is developmentally appropriate, for example, through acceleration. If placing students in another grade for instruction, implement out-of-level testing or some other procedure for measuring their academic accomplishments relative to their prospective peer group.

6. Emphasize that true academic giftedness is evidenced by accomplishment. Predictions that one might someday exhibit excellence in a domain are not helpful unless they translate into purposeful striving toward the goal of excellence. The attainment of academic excellence requires the same level of commitment by students, their families, and their schools as the development of high levels of competence in any other domain. Students may find it helpful to consider identification as a high-potential student as analogous to being identified as a high-potential athlete and then investigate the duration and intensity of training that high-caliber athletes endure in order to rise to the top of their sport.

The primary goal of programs for academically capable students should be to identify students who currently exhibit academic excellence and to provide appropriately challenging instruction for them. The secondary goal should be to identify students whose current accomplishments are strong and who display aptitude for even higher levels of achievement. Although minority students will be in both groups, more will be found, at least initially, in the latter group than in the former. *The real challenges, then, are identifying these students and providing the sort of engaging instructional opportunities that will enable more of them to move from the high-potential group to the high-accomplishment group.*

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