




Individual Intelligence Testing and Giftedness:

A Primer for Parents

By Gregory R. Machek and Dr. Jonathan A. Plucker

Editor's Note. This article is the second part of our series on testing and assessment. The series began in the March, 2003 issue.



The use of intelligence testing to identify giftedness can be one of the most daunting aspects of gifted education for parents. Testing has a rich but complex history, and educators sometimes forget that the highly specialized terminology of testing may be complicated jargon to parents. Indeed, we once sat in a parent-teacher meeting in which educators used terms like WISC and standard score, only to have the parents ask at the end of the meeting, “What have you been talking about?” Even the most well-reasoned, step-by-step process of an evaluation for giftedness can seem to be foreign territory for many parents.

Intelligence tests have encountered criticism from some, in relation to their fairness for all students or their comprehensiveness in assessing a wide range of abilities, for example. One of the chief criticisms has been the over-reliance on the use of intelligence tests, alone, in

identifying gifted students. Philosophically, intelligence tests have always been intended to be but a part of a larger evaluation process. For example, a typical system for identifying gifted children might include parent and teacher reports of the child's behavior, a review of her or his creative work, direct observation of the child by a professional like a trained school psychologist, and, finally, standardized intelligence tests. The use of multiple assessments is also consistent with current views of giftedness that involve creativity, leadership, or artistic talents among the abilities that make up an “exceptional” student, in addition to academic and intellectual prowess. Intelligence tests, then, should be just part of a multi-dimensional process. Still, intelligence tests can, and do, provide valuable information regarding a child's abilities. Despite some criticism, they are still widely used to make placement decisions for gifted as well as

learning disabled and intellectually challenged students. Intelligence tests have been developed in a manner that makes their results fairly reliable (or consistent over time). Because their development usually involves a substantial amount of research, they are often perceived as adding an element of accountability to the identification process.

The purpose of this article is to provide an overview of the testing process, with a focus on what parents can expect if their child is taking an individually administered intelligence test in order to be considered for services as a gifted learner. A thorough discussion of all the issues surrounding assessment for giftedness is beyond the scope of this article. However, since it is likely that your child will be administered such a test for consideration for participation in a gifted program, we believe it useful for you to have a basic understanding of what individual intelligence tests are and how they are administered and interpreted. We present a brief history of intelligence testing, explain some basic characteristics of individually administered intelligence tests, provide an overview of the testing process, and describe parents' rights and responsibilities regarding the use of these tests.

Historical Background

The pursuit of an efficient and accurate way to measure comparative cognitive abilities in humans is not new. As long ago as 2200 B.C., Chinese emperors are reported to have used large-scale "aptitude" testing for the selection of civil servants. At the end of the 19th century, the foundation was being extended for today's methods of assessing intelligence. For example, Sir Francis Galton sought to predict one's intellectual capacity through tests of sensory discrimination and motor coordination. Although his belief that such capacities were necessarily correlated with intelligence was eventually seen as unfounded, he ushered in an age when the measurement of intelligence was largely carried out by quan-

tifying (or making measurable) those traits assumed to be correlated to it. In fact, through the years, the evolution of thinking regarding the measurement of intelligence has encompassed three main areas:

- What do we mean by the intangible word "intelligence"?
- What tangible traits can we actually measure?
- How might we faithfully deduce the relationship between those?

During the early 19th century, Alfred Binet and his colleagues published what could be considered the precursor of most common intelligence measures. Although its main purpose at the time was to diagnose mental retardation, its basic characteristics are still used in today's intelligence tests. Binet's scale (the Binet-Simon Scale) followed standardized instructions for administration and used items in order of difficulty, mindful of the typical developmental abilities of children of differing ages. For example, the examiner would ask the participant to point out objects in a picture, or to discriminate between two weights. The authors already determined the ages at which children were most successful at each task. Over repeated administrations with many children of different abilities and ages, it was possible to determine mathematically the type of score that was "typical" of a five-year-old or of, for example, the average 12-year-old.

Today, two widely used tests are the Stanford-Binet Intelligence Scale – Fourth Edition (SB-IV; which still carries the Binet namesake) and the Wechsler Intelligence Scale for Children – Third Edition (WISC-III), although new versions of each test have recently been published. A number of other scales also exist, especially for special populations of children, such as the very young or those who have limited verbal abilities. Table 1 lists several of the individually

administered intelligence tests commonly used today. In general, these modern intelligence tests aim to measure abilities that many experts believe to be important elements of the concept of "intelligence." These include, but are not limited to, the ability to solve problems, acquire knowledge, and adapt to one's environment.

Group Versus Individually Administered Tests

Since the measurement of intelligence is largely accomplished by having students answer questions and complete tasks, the assessment process can involve either a group or individual students. Taking a group-administered intelligence test would involve a familiar experience for most students; it would be similar to many other common testing experiences, such as college entrance exams, statewide proficiency tests, or academic achievement tests that children take in their regular school classrooms. In the group testing experience, children would be seated at tables or desks with many other students. The test tasks are almost entirely a paper-pencil format, and answers are often multiple choice. This approach has advantages, such as efficiency in the time it takes to administer and score the measures.

Individually administered tests differ in that the testing environment includes only the child and the test administrator or examiner. This arrangement offers more flexibility in the types of questions or tasks that the child is presented. It also has the advantage of controlling environmental variables, such as noises and distractions in the testing room. The result can be a more comprehensive assessment of the qualities thought to make up intellectual ability or aptitude, taken in an environment conducive to effective performance. In this article, we focus on the use of individually administered tests, although many of the suggestions for parents apply to most forms of standardized testing.

Characteristics of Individually Administered Tests

Intelligence tests are also sometimes called potential-based assessments because they provide an educated guess as to how well a student might be expected to do in school (that is, their academic potential). Discussions about them can often be confusing because of the techni-

cal wording and procedures involved in the testing process. In this section, we explain some characteristics common to most individually administered intelligence tests. (See the first article in this series, in the March, 2003 issue of *Parenting for High Potential*, for more information about many of these terms.)

Standardization

Most intelligence assessments are standardized. Standardized tests have a straightforward set of criteria that the examiner must follow as he or she administers and scores the test. For example, questions are asked using specific wording that is the same for everyone who takes the test. Test manuals often

Table 1. Popular Individually Administered Tests of Intelligence

Test	Age Range	Description
Stanford-Binet Intelligence Scale, Fifth Edition (SBIS-V)	2 – 90+	An update of the SB-IV. In addition to providing a Full Scale score, it assesses Fluid Reasoning, Knowledge, Quantitative Reasoning, Visual-Spatial Processing, and Working Memory as well as the ability to compare verbal and nonverbal performance.
Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV)	6 – 16.11	An update of the WISC-III, this test yields a Full Scale score and scores for Verbal Comprehension, Working Memory, Perceptual Reasoning, and Processing Speed.
Woodcock-Johnson III Tests of Cognitive Abilities	2 – 90+	This test gives a measure of general intellectual ability, as well as looking at working memory and executive function skills.
Cognitive Assessment System (CAS)	5 - 17	Based on the “PASS” theory, this test measures Planning, Attention, Simultaneous, and Successive cognitive processes.
Wechsler Adult Intelligence Scale (WAIS)	16 - 89	An IQ test for older children and adults, the WAIS provides a Verbal, Performance, and Full Scale score, as well as scores for verbal comprehension, perceptual organization, working memory, and processing speed.
Comprehensive Test of Nonverbal Intelligence (CTONI)	6 – 18.11	Designed to assess children who may be disadvantaged by traditional tests that put a premium on language skills, the CTONI is made up of six subtests that measure different nonverbal intellectual abilities.
Universal Nonverbal Intelligence Test (UNIT)	5 - 17	Designed to assess children who may be disadvantaged by traditional tests that put a premium on language skills, this test is entirely nonverbal in administration and response style.
Kaufman Assessment Battery for Children (KABC)	2.6 to 12.5	This test measures simultaneous and sequential processing skills and has subscales that measure academic achievement as well.
Naglieri Nonverbal Ability Test (NNAT)	K -12 th grade	The NNAT provides a Nonverbal Ability Index based on student performance on a series of progressive matrices.

give explicit examples of right or wrong answers. The goal of standardization is to control all of the elements involved in the testing process with the exception of the child's responses. The standardization can even extend to instructions about the testing environment, such as where the test should take place and who can be present.

Many potential-based tests are also norm-referenced. That is, the test was initially administered to a large number of children, possibly in the thousands. Ideally, this norm group is characteristic of the children who ultimately will be taking the standardized instrument. When this is true, you have a degree of confidence that the results enable you to compare your child's scores to the scores of other children of the same age, grade, or demographics, making it possible to say how well a child performed relative to similar peers.

Scores

It is also useful to understand the way in which scores from common standardized measures are represented. On a norm-referenced test, scores indicate where a particular student's results fall in relation to all other results obtained. Standardized measures are designed so that the norm group, which is selected so that it has people of all types of abilities, obtains scores that are distributed like a bell or normal curve (See Figure 1). The curve is largest in the middle because most people perform somewhere near the average. The distribution is much smaller to the left and the right, signifying that fewer students have exceptionally low or high scores.

Standardized tests use standard scores to report results. Although the name sounds like it would simplify interpretation, it can be complex. Different test makers choose rather arbitrary numbers to represent "average" scores and use different numerical scales. In Figure 1, for example, note that one testing company

uses 500 to designate an average score and the overall range of scores goes from about 200 to 800. In contrast, popular intelligence tests use the number 100 to designate average scores and tend to use a smaller range of numbers to represent the total range of possible scores on the measure. This standard score is often referred to as an IQ score, hence the popular label of "IQ tests."

Many scores are also commonly reported with their corresponding percentile ranks, which can simplify interpretation. Hypothetically, percentiles tell you where your child's score ranks relative to other students who took the test. For example, if parents are told that their son obtains a score that falls at the 50th percentile, it means their son's score equals or exceeds the scores of 50% of the same-aged peers who also took that test. If a child's score falls at the 99th percentile, it can be said that she would score as well or better than 99 out of 100 of her same-aged peers on that particular measure.

The Testing Process

Parents should be aware that guidelines for "best practice" are not always followed carefully. For that reason, you should understand the basic guidelines for best practice and be prepared to ask questions about the ways in which the test is being administered. In this section, we provide information that will help you understand the process that your child will experience when taking individually administered intelligence tests. This knowledge may help you and your child know what to expect and to feel more comfortable about the testing experience.

What to Expect

First, since such tests do not directly assess the same things that are taught in the classroom, it is difficult to "study" for them. Instead, preparation should probably consist of a good night's rest. In addition, it is sometimes necessary to put your child at ease about the expectations of the session. Since children usually

think of tests as something that they can do "well" or "poorly" on, it may be appropriate to explain that the test they will be taking is different. Intelligence tests can be described as ones that are not concerned with "passing" and "failing." You can explain that the test aims to get a better understanding of the child's unique abilities and strengths in a number of different areas or tasks.

As Pleasant an Experience as Possible

Ideally, the actual testing session takes place in a room that is comfortable in environment and atmosphere, thereby reducing distractions. The test administrator for most major intelligence tests is required to have professional training in their administration and interpretation; this person may often be a licensed school psychologist. The psychologist and your child are usually the only people in the room during testing. One of the most important aspects of the testing session is for a comfortable rapport to be established before testing takes place. If the student is rushed right into a novel, and possibly intimidating, task, her performance may suffer. The examiner must also be adept at dealing with a variety of different personalities and student characteristics. Young children, in particular, can be challenging to test, since their attention spans are shorter and their behavior is largely dictated by what is currently attracting their interest. The examiner should be alert to signs of fatigue or the need for a restroom break, for example.

Tasks Involved

In order to get a fuller understanding of a child's abilities, intelligence tests require him or her to perform a number of tasks that vary widely in what they are asking. For example, one task, often also referred to as a subtest, might ask a child to answer questions about everyday knowledge. Another subtest may ask him or her to construct specific patterns using colored beads or blocks. Other subtests may tap into the child's ability to recognize

similarities between concepts or written symbols. The test seeks to measure many different abilities that will contribute to an understanding of the child's intelligence.

Probable Length of Testing

The time it takes to complete an individually administered intelligence test can vary depending on a child's age, response style, and the amount of questions she answers acceptably. The questions on most subtests are designed to increase in complexity, with administration of the subtest ending when the child answers a predetermined number of questions incorrectly. Younger children will tend to "max" out more quickly than older students. In addition, more reticent or reflective students will tend to take longer. Whereas some subtests are timed, others allow ample time for the respondent to think through her or his answer before responding. On average, one

should expect a single testing session to involve an hour and twenty minutes, give or take twenty minutes.

A ceiling effect may impact both the length of the testing session and the results of the test. A ceiling effect is present when a child responds correctly to all or most of the items on a subtest, making it difficult to discriminate differing levels of intelligence in children of high ability. This is common for gifted students on group achievement tests, but ceiling effects also occur on individually administered intelligence tests. Certain tests have higher "ceilings" than others, and parents might ask the testing professional about the potential for a ceiling effect when their child is tested.

Reporting Irregularities

Since individually administered tests are standardized, the examiner is obligated to adhere to strict procedures for admin-

istering each test. Any time that there are unusual or unexpected circumstances that may influence the results of a test, the examiner is required to report this in her or his report on the testing session. For example, if a student appears overly guarded and shy, and this behavior may have kept him from answering correctly or with confidence, this will likely be noted. If for some reason the climate in the room is not acceptable (overly hot, cold, dark, etc.), the examiner will be expected to report those concerns. Although rare, younger children may refuse to be tested unless their parents are present in the room. In these cases, the parent might sit so that the child cannot see him or her while responding to the test items. In these or other unusual situations, the examiner will have the responsibility to relate any such irregularities in his or her report, and may decide that the irregularities invalidated the assessment

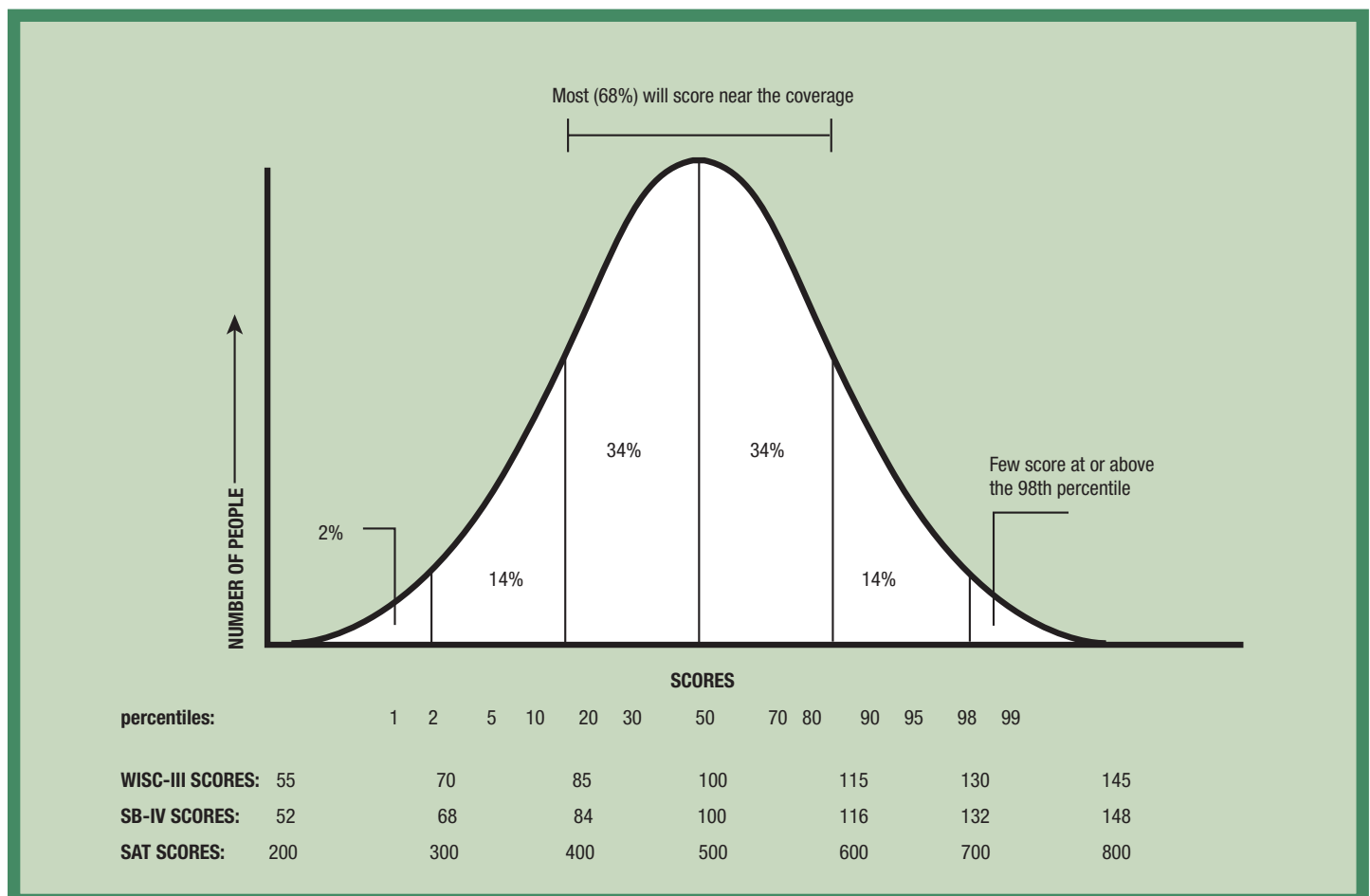


Figure 1. Varied ways of Representing Test Results as Scores

results or that the details will need to be considered to help interpret the test results. You should be aware that these circumstances might arise in the testing experience, and are not a cause for undue alarm or concern.

Parents' Rights Regarding Educational Records

Because of concerns regarding student record-keeping practices, the federal government enacted the Family Educational Rights and Privacy Act (FERPA) in 1974. The aim of this law is to ensure that you, as parents, have access to your child's educational records and that schools do not give out information to others without your permission. Failure by the school to abide by these guidelines can result in the school's loss of federal funding. Under FERPA, families have a legal right to amend information they believe is untrue as stated in their child's file. There is also an appeals and hearing process if parents and the school disagree.

Further, school personnel have a responsibility to explain the results of your child's assessment in a timely manner and in a way that is understandable. For example, if your local school psychologist uses technical jargon with which you are not familiar, you have every right to ask for and expect a clarification.

State and Local Regulations

Currently, children that are identified as gifted do not enjoy the same level of assurances in regards to specialized assessment and programming as children with disabilities. However, it is important to check with your local school district to see what provisions for gifted education may be in place through local or state policies. Some states' code for the assessment and education of gifted students closely parallel the rights and services for children with identified disabilities. Similarly, different schools or school districts may have adopted their own policy on how to best identify and educate gifted students.

Tips on Advocating for Your Child

As parents, you are often the strongest advocates for your children's education. Many times educators will approach parents about the possibility of assessing a child for gifted services or placement in a gifted program. At other times, parents may feel that their child may be intellectually or academically exceptional and believe that access to gifted education services would be appropriate. In both instances, consider some basic suggestions about testing.

① *Be patient with the assessment process.* Often, the school will incorporate parental input when deliberating a child's admittance into gifted programming. Even if this does not occur, realize the amount of data that school personnel are trying to sift through in an effort to be fair about such decisions. This information, and the variety of people involved, make it necessary to be patient with the process. It will be difficult not to want to push the process along, especially since your child's education is at stake. However, strong advocacy can feel like strong demands from the school's point of view, creating an atmosphere in which each side tends to see the other as an adversary or an obstacle to be avoided; in that case, the true objective, the best interest of the student, may be compromised.

② *Use care in considering outside examiners.* You may decide to have your child evaluated by a professional outside of the school system. This may result from the feeling that the school is unresponsive to your child's needs, or that the process would take too long if done through the school system. In such cases, consider the qualifications of the testing psychologist carefully, and determine whether the school will consider data provided by outside examiners. Although various learning centers and educational assessment companies can be found in most metropolitan areas, be aware that some may only provide basic test results at a high cost. You may be left on your own

to explain the meaning of the results to school administrators. Seek licensed psychologists who specialize in working with children and who understand the issues and procedures involved in identifying gifted students. You may also find that local universities often offer testing services at significantly reduced cost.

When approaching third party professionals for testing services, notify school personnel about your intentions to assess your child's strengths. In addition, be up-front and honest with any third party professionals so they understand the exact reasons for the testing and are comfortable with relating test results both to you and to school personnel.

③ *Ask questions about the testing process.* In addition to helping keep your informed, having answers to your questions will put you at ease about the testing experience and the results. Your child will sense your comfort, or lack of it. By asking questions, you also help the professionals who will administer and interpret the test to understand your goals and concerns; this can facilitate the communication process among the examiner, the parents, the child, and the school.

The Bottom Line

Despite the criticisms and limitations of individually administered intelligence tests, they may play a valuable role in the identification of gifted individuals. No single assessment instrument or score should ever be relied upon for making such high-stakes decisions. However, used as part of a comprehensive, multifaceted procedure, intelligence tests can still yield useful information. They can help you understand what your children will be experiencing and how to interpret assessment results. Most importantly, do not be afraid to ask questions.

Author Note. *Gregory R. Machek and Dr. Jonathan A. Plucker are members of the faculty of the W. W. Wright School of Education, Indiana University, at Bloomington, IN.*