



Rationale and Overview of the SAGES-2

THE TERM *GIFTEDNESS* HAS appeared in the literature of psychology and education since the beginning of the 20th century. Professionals working in these disciplines have expressed a need for well-constructed standardized tests that assess giftedness, specifically tests that (a) provide the examiner with a comparative index of children's strengths in mathematics, science, language arts, social studies, and reasoning; (b) can be administered to groups of children; (c) are sufficiently reliable that the examiner can have confidence in their results when they are used with individuals; (d) are sufficiently valid that the examiner will know what abilities are being measured; (e) have sufficient numbers of difficult items to record differences in the abilities of gifted students; and (f) have norms based on a large representative sample of regular and gifted students.

This chapter provides information on the history of giftedness and an overview of the SAGES-2. Specifically discussed are an overview of giftedness, the history of education for gifted children, the history of identification of gifted children, issues related to identifying children as gifted, and an overview of the *Screening Assessment for Gifted Elementary and Middle School Students—Second Edition* (SAGES-2).

An Overview of Giftedness

This section provides an overview of giftedness. Specific topics are a brief historical perspective of giftedness, definitions of gifted and talented, and models of giftedness.

Brief Historical Perspective of Giftedness

In the early part of the 20th century, the concept of giftedness was closely associated with highly intelligent and academically achieving children typically identified by intelligence

scores (Henry, 1920; Whipple, 1924). For example, in his study of gifted individuals, Terman (1925) selected only those subjects who were in the top 1% of the school population as measured by the *Stanford Revision and Extension of the Binet–Simon Scales for Measuring Intelligence* (Terman, 1917). Similarly, Hollingworth (1926) defined gifted children as those who were in the top 1% of the school population; however, she added, “a gifted child may be far more excellent in some capacities than in others” (p. 202).

These views of giftedness corresponded to Spearman’s (1923) early research identifying one underlying ability common to all tests, which he labeled *g*, for general intelligence. He also added *specific factors* after discovering higher correlations among certain sets of tests. However, these factors were relegated to minor roles. Later Cattell (1963) represented Spearman’s *g* by two kinds of ability: *fluid* and *crystal*. Fluid ability referred to the successful adaptation in situations in which previously learned skills are of no advantage, whereas crystallized ability referred to those areas influenced by experience and training. Other researchers, such as Thorndike (1927) and Thurstone (1938), proposed a multitude of distinct abilities that comprised intelligence. Thorndike named three clusters of mental activities: social intelligence, concrete intelligence, and abstract intelligence. Thurstone identified seven “primary mental abilities”: verbal meaning, number facility, inductive reasoning, perceptual speed, spatial relations, memory, and verbal fluency. These researchers attempted to eliminate *g* as a significant factor; however, after an extensive review of the literature, Jensen (1980) concluded that the high positive correlations among current tests that measure intelligence still support the concept of general ability.

Beginning in the 1950s, researchers began to recognize the limitations of intelligence tests in identifying gifted children. Guilford’s (1950) early factor analysis produced a fifth kind of ability, *divergent production*, which differed from the other four—comprehension, memory, evaluation, and convergent production. He identified tests of divergent production as those that require examinees to produce their own answers and those that involve creative thinking. In support of Guilford’s analysis, Getzels and Jackson (1962) reported a low correlation between intelligence scores and scores on tests designed to measure creativity. They concluded that intelligence tests seemed to measure “convergent thinking,” the ability to recall and recognize facts, but neglected to measure “divergent thinking,” the ability to invent and innovate. Witty (1940) stated that the content of tests of intelligence was lacking in situations that disclose originality or creativity and recommended that the definition of giftedness be expanded to include creative or productive thinking. From the work of Getzels and Jackson (1962) and Guilford (1950), characteristics related to creativity began to emerge in discussions of the nature of giftedness.

Since Getzels and Jackson’s (1962) study, research has yielded correlations between the scores of creativity tests and intelligence tests from near zero to moderately positive, raising questions whether tests of divergent thinking can actually help discern talent that

other instruments overlook. The size of these coefficients suggests that the two areas do not overlap completely (Tannenbaum, 1983). Based on such evidence and his own observations, Thorndike (1966) concluded that there is a broad domain of human abilities characterized by divergent thinking that is mostly unrelated to those abilities measured by conventional intelligence tests.

This emphasis on multiple abilities of giftedness has continued through the end of the 20th century, with Gardner (1983) proposing seven separate domains or intelligences and Sternberg (1985a, 1997) identifying three. Gardner's list includes linguistic, logical–mathematical, spatial, musical, bodily–kinesthetic, interpersonal, and intrapersonal intelligences. Sternberg identified analytic giftedness, an academic talent typically measured by intelligence tests; synthetic giftedness, similar to creativity; and practical giftedness, applying analytic or synthetic abilities to pragmatic situations.

Definitions of Gifted and Talented

As might be expected, the emphasis on different abilities of giftedness discussed in the previous section is also found in the first definition for gifted and talented children provided by the Advisory Panel to the U.S. Office of Education (USOE) in 1972 in its report to Congress titled *Education of the Gifted and Talented* (Marland, 1972, p. 9):

Gifted and talented children are those identified by professionally qualified persons who, by virtue of outstanding abilities, are capable of high performance.

These are children who require differentiated educational programs and/or services beyond those normally provided by the regular school program in order to realize their contribution to self and society.

Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas, singly or in combination:

1. general intellectual ability;
2. specific academic aptitude;
3. creative or productive thinking;
4. leadership ability;
5. visual and performing arts;
6. psychomotor ability.

According to Marland (1972), general intellectual abilities included verbal, number, spatial, memory, and reasoning factors most often associated with superior performance in school and on intelligence tests. Academic aptitude included specific abilities in one or more school subject areas such as science, mathematics, social studies, and language. Creative or productive thinking represented originality in solving problems, flexibility in thinking, and fluency in ideas. Individuals who demonstrated an ability to improve

human relationships and assist groups in attaining goals would fall in the category of leadership. Talents in the visual and performing arts were demonstrated by the skills of prominent artists, dancers, writers, musicians, and actors in their fields. Psychomotor ability was demonstrated in athletics or in those mechanical skills required by engineering, fine arts, and science.

More recently, the U.S. Department of Education's Office of Educational Research and Improvement (Ross, 1993) issued a report, titled *National Excellence: A Case for Developing America's Talent*, that included this new definition:

Children and youth with outstanding talent perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment.

These children and youth exhibit high performance capability in intellectual, creative, and/or artistic areas, possess an unusual leadership capacity, or excel in specific academic fields. They require services or activities not ordinarily provided by the schools.

Outstanding talents are present in children and youth from all cultural groups, across all economic strata, and in all areas of human endeavor. (p. 26)

Although F. Karnes and Koch (1985) found that only a few states used the exact 1972 USOE definition, 76% of the states considered at least two or more areas of giftedness in their definitions. More recently, M. R. Coleman and Gallagher (1995b) reported that, within their definitions, 49 states recognize intelligence and achievement, 41 recognize creativity, 35 recognize artistic abilities, and 30 recognize leadership.

Models of Giftedness

Similar to many theories of intelligence and current federal and state definitions, models of giftedness also incorporate a wide variety of abilities. From his research about the life histories of eminent persons, Areti (1976) postulated three human attributes that he identified as related and yet separable: talent, creativity, and aptitude (see Figure 1.1). Talent is identified through a demonstrated performance or product, generally in the arts. Creativity is defined as divergent thinking (Guilford, 1950) or as synthesis, that is, putting together elements or parts to form a whole requiring original thinking (Bloom, 1956). Aptitude is the capacity to benefit from instruction and is associated with intelligent behaviors. Gifted and talented children are those who perform well on qualitative and quantitative instruments that measure one or more of these three attributes.

Renzulli (1978, 1986) proposed a model of giftedness that consists of the interaction of three clusters of human traits: above-average general abilities, high level of task

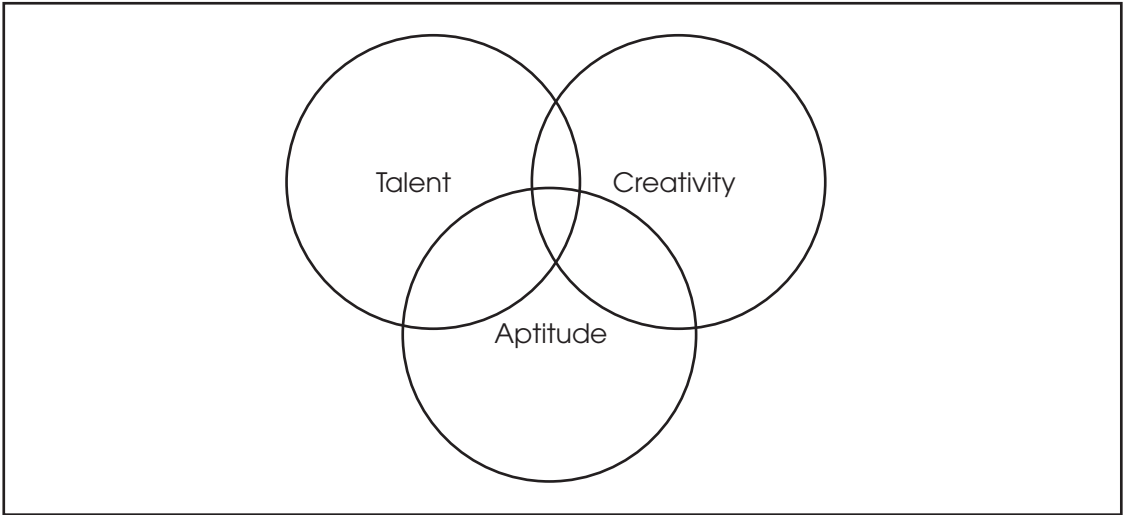


Figure 1.1. Areti's model of giftedness. *Note.* Adapted from *Creativity: The Magic Synthesis*, by S. Areti, 1976, New York: Basic Books. Copyright 1976 by Basic Books. Adapted with permission.

commitment, and high level of creativity (see Figure 1.2). Above-average abilities are demonstrated by performance in school and on objective intelligence and achievement tests. A high level of task commitment is represented by persistence in accomplishing goals and a drive to achieve. A high level of creativity is demonstrated by originality in solving problems. These clusters are brought to bear upon general performance areas, such as mathematics and the social sciences, and upon specific performance areas, such as advertising and choreography. Gifted and talented children are those who demonstrate or have the ability to demonstrate all of these clusters of traits.

Tannenbaum (1983) proposed a model that included five factors that influence the success of gifted adults: general ability, special ability, nonintellective factors, environmental factors, and chance factors (see Figure 1.3). General ability is defined as *g*, or general intelligence. Special ability is defined as a talent that produces outstanding performance and productivity, such as a musical composition or an invention. Nonintellective factors, such as dedication and willingness to make sacrifices, facilitate great accomplishments. Environmental factors, such as a stimulating home, school, or community, maximize potential. Chance factors are those unpredictable yet critical circumstances of life that create opportunities for performance. All five of these factors interact in producing successful gifted adults.

Gagné's (1985, 1991) model defines *gifts* as ability or aptitude and *talents* as performance. "Giftedness corresponds to competence that is distinctly above average in one

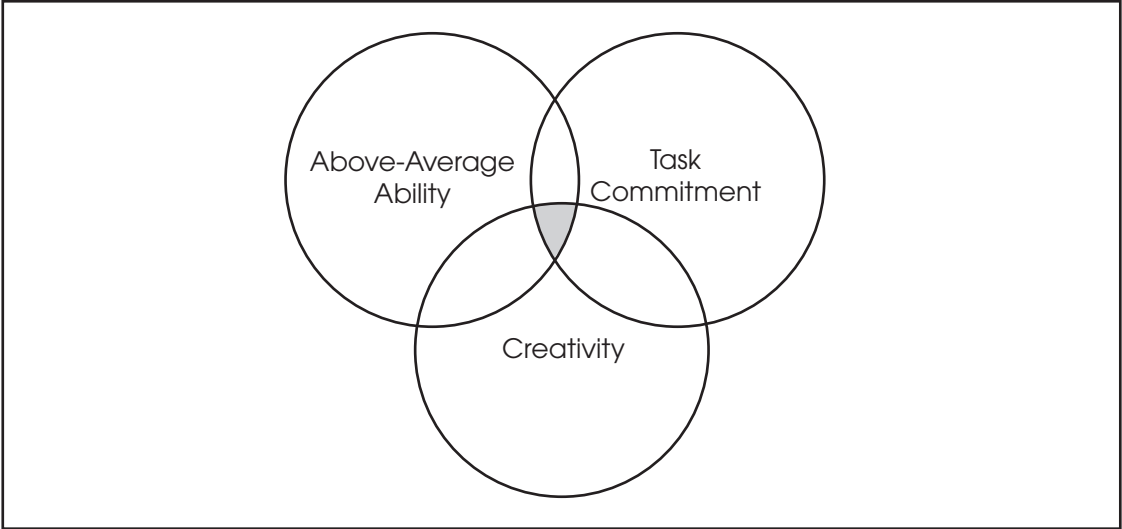


Figure 1.2. Renzulli’s model of giftedness. *Note.* From “The Three-Ring Conception of Giftedness: A Developmental Model for Creative Productivity,” by J. S. Renzulli, 1986, in *Conceptions of Giftedness* (p. 66), by R. J. Sternberg and J. E. Davidson (Eds.), New York: Cambridge University Press. Copyright 1986 by Cambridge University Press. Reproduced with permission.

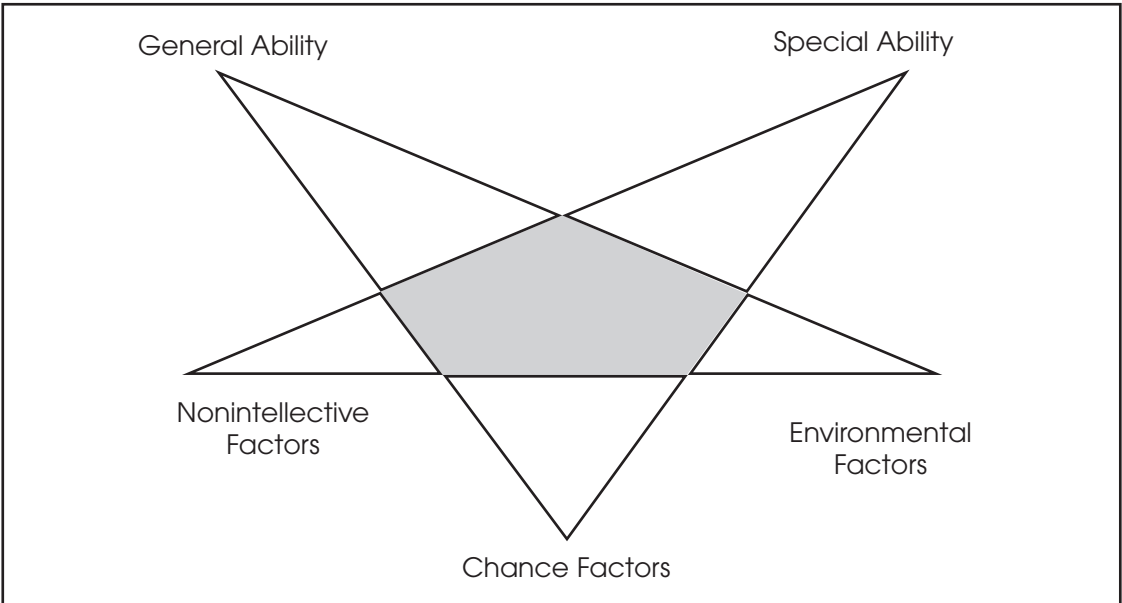


Figure 1.3. Tannenbaum’s model of giftedness. *Note.* From *Gifted Children: Psychological and Educational Perspectives* (p. 87), by A. Tannenbaum, 1983, New York: Macmillan. Copyright 1983 by Macmillan. Reproduced with permission.

or more domains of human aptitude. Talent corresponds to performance that is distinctly above average in one or more fields of human activity” (p. 66). According to Gagné, environmental, intrapersonal, and motivational factors act as catalysts in transforming gifts into a variety of talents (see Figure 1.4).

Summary

In the early 20th century, giftedness was equated with high intellectual and academic ability. By the mid-1900s, the view of giftedness began to change to embrace multiple abilities, a change that coincided with cognitive theorists’ views of intelligence. This emphasis is reflected in today’s federal and state definitions as well as in models of giftedness. Although there exists no commonly accepted view, definition, or model of giftedness, professionals would agree that gifted children vary cognitively and experientially. Gifted children vary in their ability to acquire and retain knowledge, in the way they use knowledge, in the way they generate or create knowledge, and in their motivation, interests, opportunities, and background experiences (Gagné, 1991; Renzulli, 1986; Shaklee & Viechnicki, 1995; Sternberg, 1997; Tannenbaum, 1983).

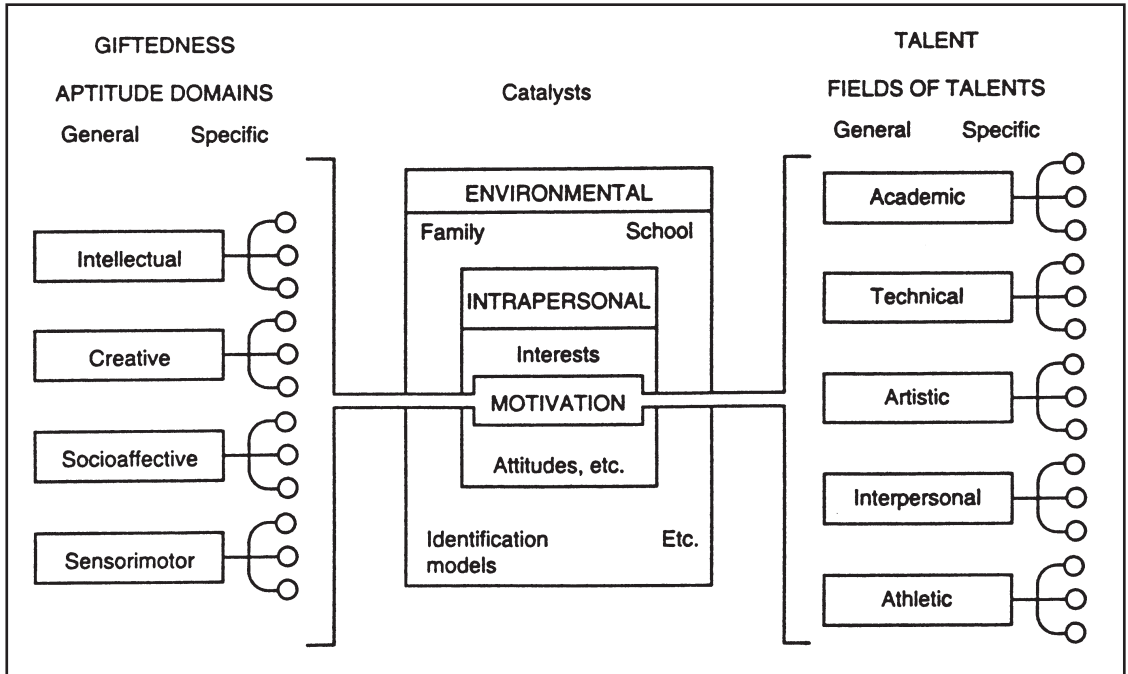


Figure 1.4. Gagné’s model of giftedness. *Note.* From “Toward a Differentiated Model of Giftedness and Talent,” by F. Gagné, 1991, in *Handbook of Gifted Education* (p. 67), by N. Colangelo and G. A. Davis (Eds.), Needham Heights, MA: Allyn & Bacon. Copyright 1991 by Allyn & Bacon. Reproduced with permission.

History of Education for Gifted Children

This section provides a brief history of the education of gifted students. Because the SAGES-2 is a measure of both reasoning and academic ability, this discussion describes the historical path ending with the current emphasis of educating gifted students in general intellectual and specific academic programs.

According to McDonald (1915), the first special programs for gifted students focused on accelerating students through the existing academic content. Students worked at twice the ordinary rate of the prescribed school program and often completed 6 years of work in 4. As the Stanford-Binet (Terman, 1917) became available, students were selected for special classes on the basis of intelligence test scores. During the 1920s, enrichment instead of acceleration became the preferred practice. Gifted students were taught in regular or special classes and allowed to work on independent projects, studying subject areas in greater depth. While two thirds of the school systems in cities with populations from 2,500 to 25,000 had some form of ability grouping, Otto (1944) observed that support for special programs for gifted students declined after 1930. By 1948, Heck (1953) noted that only 15 of the 3,203 cities with school populations of 2,500 or more had special schools or classes for the gifted.

During the 1950s, certain events stimulated a renewed interest in gifted children. With the advent of *Sputnik*, competition began between the United States and USSR for dominance in space. The desire for more highly skilled personnel in the natural sciences revealed shortages in this field. Consequently, concerns about shortages led to a nationwide talent hunt for individuals who might have potential in the technological area. Public and private funds again became available for classes for the gifted, particularly in mathematics and science areas. Educators began designing and implementing special enrichment programs. However, few of these programs were directed toward students whose talents were in the arts, mechanics, and social leadership. In addition, children from ethnic minorities, children from lower socioeconomic groups, and children with physical disabilities were rarely admitted to gifted programs.

When the nation focused attention on civil rights, racial integration, compensatory education, and Vietnam, the upswing in gifted programs slowed down considerably. The *Education Index* of 1970 contained only half the number of entries under “Gifted Children” that the 1960 volume had. A revival of interest in gifted education occurred only when gifted students were added to those receiving federal monies under Titles III and V of the Elementary and Secondary Education Act in 1970. In addition, the Office of the Gifted and Talented was given official status by legislation in 1974. Once again, federal funds helped to restore an interest in the field for education of gifted students. For example, in 1973 only 5% of the states provided programs for gifted students; by 1977 nearly 75% of the states had established definitions and programs (Zettel, 1979).

During the 1980s, several events influenced another decrease in programs for gifted and talented students (M. R. Coleman & Gallagher, 1995a): the strong movement toward detracking (Oakes, 1985); the emphasis on the basics of reading, writing, and math; and the underrepresentation of ethnic minorities in gifted classes. In 1988, the Jacob Javits law revitalized the U.S. Office for the Gifted and provided funds for a limited number of gifted programs. Priority areas for funding were the identification and service of children representing minorities, disabilities, and socioeconomic deprivation. Later, the poor performance of students in international assessments such as the Third International Mathematics and Science Study (Peak, 1996) caused the U.S. government concern about the ability of U.S. students to excel academically and compete globally. Consequently, the government developed more rigorous national standards, interest in national assessment instruments increased, and advanced placement courses became available.

Although the number of gifted programs has fluctuated through the years, most programs still focus on the general intellectual and specific academic areas (M. R. Coleman & Gallagher, 1995a; O’Connell, 1985). The criteria for entrance into gifted programs have been aligned with this emphasis and almost always include testing designed to measure these areas. Although programs for gifted students emphasize intellectual ability and academics, recent studies support that acceleration and curriculum should match student abilities (Kulik, 1992; Rogers, 1991). Therefore, these researchers strongly encourage the training of teachers in identifying and serving gifted students.

History of the Identification of Gifted Children

Procedures used to identify students as gifted have changed from a focus on a single intelligence test score in the early 1900s to the current focus on multiple procedures and instruments. In fact, prior to the 1950s, identification of gifted children was based almost totally on intelligence test scores. By 1985, O’Connell found that 32 states used a multiplicity of procedures and instruments, of which the IQ test is but one. Required cutoff scores on intelligence tests ranged from 120 to two standard deviations above the mean. Procedures other than intelligence tests included both qualitative and quantitative instruments: rating forms, checklists, critical thinking tests, creativity tests, achievement tests, self-concept inventories, and product samples.

The U.S. Department of Education (Ross, 1993) encouraged schools to include an assessment procedure that identified a variety of talents within a range of disciplines, used multiple measures, reduced bias, was flexible or fluid, identified potential, and assessed motivation. M. R. Coleman and Gallagher (1995b) found that states apparently responded to the USOE’s encouragement. In a review of state policies related to refer-

ral, testing practices, nontest input, and general identification procedures, the researchers found that states use multiple sources during screening: 46 states use teacher nominations; 45 states use achievement tests, aptitude tests, and parent nominations; 44 states encourage products, work samples, and creativity tests; and 29 states use curriculum-based assessment.

All 49 of the states use some form of intelligence test and achievement test results in their identification process. Responding to the underrepresentation of special populations, 40 states even use different criteria to identify these students. Although state policies encourage the use of a multiplicity of assessment instruments, the National Research Center for Gifted and Talented found that the most frequently used measures in school districts continued to be intelligence tests (Callahan, Hunsaker, Adams, Moore, & Bland, 1995). In addition, the majority of states encourage at least a three-step process—screening, identification, and placement—in identifying children for various gifted programs (M. R. Coleman & Gallagher, 1995b).

The *screening stage* consists of the nomination of students for the gifted program. Sixteen states begin screening in prekindergarten, and 47 states screen from Grades 1 through 12. At this stage, a variety of data are used. For example, teachers, parents, peers, or the child may provide nominations to the principal or coordinator of the gifted program. Depending on the program, some standardized test scores may be used as a cutoff in determining who is nominated. For example, any one or a combination of the following may place a student into the nomination pool: an 84th percentile ranking on an achievement test, two nominations, and a score of 115 on a group intelligence test.

During the *identification stage*, additional information may be collected or some of the information collected during screening may be used. For example, students in the nomination group are tested further to identify a percentage defined by the state or local school district gifted program and to identify those youngsters who need a differentiated curriculum. At this second level of screening, tests may be selected according to program characteristics and then administered to each child.

The *placement stage* is the actual selection of a student for the gifted program. The student's performance on each test is often recorded on a summary form such as a profile or used within a case study format. Performance variations on different qualitative and quantitative procedures are analyzed. Students who score well above the mean on individual or multiple tests are considered for placement. A committee comprised of people representing a variety of school-related professions then meets to determine which children will enter the gifted program. In 15 states, a trial-placement or pre-placement experience may also be used in assisting with placement decisions. In a trial placement, teachers evaluate students placed in the gifted program to determine whether they should continue.

Issues in Identifying Children as Gifted

The previous sections have provided the reader with a historical perspective of giftedness. This section describes common problems in identifying children as gifted, reasons for identifying young children as gifted, and ways in which the SAGES-2 ameliorates these problems.

Common Problems in Identifying Gifted Children

Stanley (1976) pointed out that tests generally used to identify gifted children were inappropriate, for they failed to have enough “ceiling.” Grade- and age-appropriate tests are often too easy for gifted children. Testing the child’s limits can be achieved only if the test is difficult enough to determine the extent of the child’s knowledge. For example, a second-grade child capable of sixth-grade mathematics work is not going to be adequately “tested” by a second-grade achievement test. In addition, students who earn perfect scores on a test may actually have different abilities that were concealed because the test is too easy. In this case, the test does not accurately measure what the student is able to do (i.e., it does not discriminate among students with high ability). Unfortunately, most tests used in the field of gifted education are not developed for use with gifted children.

The U.S. Department of Education commissioned research on identification procedures, which resulted in the *National Report on Identification: Assessment and Recommendations for Comprehensive Identification of Gifted and Talented Youth* (Richert, Alvino, & McDonnell, 1982). This report criticized certain identification practices and their effects (Richert, 1985):

1. Procedures often limit selection only to academically achieving gifted students. Intelligence, creativity, and other areas of giftedness are not being assessed.
2. Tests are being used to measure abilities that they were not designed to measure. For example, intelligence tests and achievement tests are being used interchangeably to measure specific academic and general intellectual ability. In addition, intelligence tests are often being used to identify creativity and leadership.
3. Diagnostic tests are being used for screening. Screening tests should be used for the initial stages of identification.
4. Multiple test score criteria are combined in ways that are statistically unsound. Percentiles are compared with standard scores or subjective ratings. Quantifying scores may hide performance indicators of potential.
5. Minorities are underrepresented by 30% to 70%.

Similar results have been reported by the Office of Educational Research and Improvement (Ross, 1993). The U.S. Department of Education Office for Civil Rights (OCR; 1992) data show that Native Americans, African Americans, and Hispanic Americans are consistently underrepresented among students identified for gifted educational programming. The OCR receives complaint letters regarding gifted education. The majority of 48 complaint letters that were submitted from 1985 to 1991 dealt with admissions to gifted programs (Marquardt & Karnes, 1994). Certainly a need exists for identification instruments that measure areas related to the education of gifted children, that have adequate technical qualities, and that are not biased toward any ethnic group.

Reasons for Identifying Young Gifted Children

Another important consideration when identifying gifted students is when to begin the identification process. As programs for gifted children are established in elementary schools, parents, teachers, and school administrators often express concern about identifying young gifted children. There have been several reasons offered in the literature regarding the need for early identification. Philosophically, if all gifted children have special needs and deserve a differentiated educational program, then educators must identify the special needs of children, regardless of age. As Parke (1988, p. 196) stated about young gifted children, "They differ in that they have the capability to learn at greater depth and more quickly, and they may have interests which may predate those of their peers." Other authors emphasize that differentiated educational programs do, in fact, produce enhanced learning, even at younger ages, and some emphasize that the potential of the young gifted child can be maximized (M. B. Karnes, Shwedel, & Kemp, 1985). Under a different line of thinking, M. B. Karnes and Johnson (1991) noted that several professional educators have expressed strong beliefs that underachievement in adolescents can be attributed to a lack of support of gifted children in the early years. In fact, Shaw and McCuen (1960) were able to identify underachievers as early as first grade. In addition, Johnsen and Ryser (1994) reported that achievement scores of young children who were identified as gifted and who did not receive service decreased at twice the rate of those who were not identified gifted. Clearly, programs for young children are needed.

We do not wish to endorse one reason over another for identifying young gifted children. It is, however, our strong belief, based on our experiences with gifted children and reading the literature (Feiring, Louis, Ukeje, Lewis, & Leong, 1997; Shaklee & Viecknicki, 1995), that gifted children can and should be identified at the primary level of education. This identification should lead to a differentiated education that has many benefits for these young children and their families. Only through such identifi-

cation and programming can we learn further how to best meet the needs of all gifted children.

Identification Problems Addressed by the SAGES-2

The SAGES-2 subtests allow the examiner to *sample* aspects of the most common areas measured when identifying gifted students. Because the test also includes items related to aptitude, it does not limit selection only to academically achieving gifted students. In addition, a child's performance on three different subtests may be compared.

Performance variations on the SAGES-2 subtests may assist in the identification of students who have acquired information in one or more of four core academic areas (Subtest 1: Mathematics/Science and Subtest 2: Language Arts/Social Studies) or who appear to have an aptitude for learning such information (Subtest 3: Reasoning). The availability of standard scores provides a more statistically sound measure of comparison.

Subtest 3: Reasoning uses pictures and figures. The content and format of this subtest meet some of the following guidelines offered by Jensen (1980) for a “culturally reduced” test, that is, a test that is less dependent on specific language symbols:

1. Performance measures should be used rather than paper-and-pencil tasks.
2. Preliminary practice items should be incorporated into the test.
3. The test should be untimed.
4. Test items should have abstract content instead of passages to read.
5. Items should require reasoning or problem solving and not specific factual information.
6. Novel problems should be presented to avoid the recall of previously learned information.

In addition, the SAGES-2 was initially administered only to children in gifted and talented programs. The item analysis of these data identified only those items that discriminated among the gifted group. Therefore, the test is difficult and should be able to differentiate among gifted and nongifted, even within the nomination group.

Finally, the SAGES-2 was developed to demonstrate sound technical qualities, according to the *Standards for Educational and Psychological Tests* published by the American Educational Research Association, American Psychological Association, and National Council on Measurement in Education (1999). To ensure that the SAGES-2 met these standards, adequate standardization, reliability, and validity data were collected. These data are discussed in later chapters of this manual.

Overview of the SAGES-2

This section describes the SAGES-2 and discusses its uses. The SAGES-2 was developed to address the need for a technically adequate measure that is not biased and that identifies potentially gifted students in two of the most frequently served areas: intelligence and achievement. Research suggests that this base of intelligence and achievement is necessary before talents begin to emerge and is therefore critical in the identification of potentially gifted students (Gagné, 1985; Gardner, 1993).

Three subtests were developed to measure these important areas. Like the original *Screening Assessment for Gifted Elementary Students* (SAGES; Johnsen & Corn, 1987) and the *Screening Assessment for Gifted Elementary Students—Primary* (SAGES-P; Johnsen & Corn, 1992), the subtests provide scores that assist in identifying children with potential in intellectual and academic areas. However, the SAGES-2 does not include a subtest on divergent production. To date, statistical analyses have shown that tests used to evaluate divergent production in children do not reach standards generally accepted for reliability and validity (Hunsaker & Callahan, 1995; Plucker & Runco, 1998). We also found this to be true in our work and could not devise an objective test of divergent production. Therefore, those who identify children for gifted programs should look to more subjective methods for measuring characteristics often associated with creative or productive thinking. For example, many school systems currently collect portfolios of children's creative products to represent novel, fluent, or elaborate ideas as expressed in both structured and informal environments (Borland & Wright, 1994; Fishkin & Johnson, 1998; Shaklee & Viechnicki, 1995). Although portfolios are highly subjective, some studies are beginning to report their relationship to future achievement and classroom performance (Johnsen & Ryser, 1997; Shaklee & Viechnicki, 1995).

The SAGES-2, therefore, focuses on two areas: aptitude and achievement. These subtests sample two areas that are described in the USOE (Ross, 1993) definition: intellectual ability and specific academic fields (see Figure 1.5). They also represent areas that are frequently used in the identification of students.

Unlike in the previous SAGES, school-acquired information in the SAGES-2 is divided into two subtests, Mathematics/Science and Language Arts/Social Studies. In this way the content areas are aligned more closely with an integrated academic area such as linguistic and logical-mathematical. Although researchers have found that expertise is more domain specific (Chi, Glaser, & Farr, 1988), they have also discovered some relationships between domains. For example, Plucker, Callahan, and Tomchin (1996) confirmed the presence of two subscales—linguistic and logical-mathematical—in a battery of 13 activities.

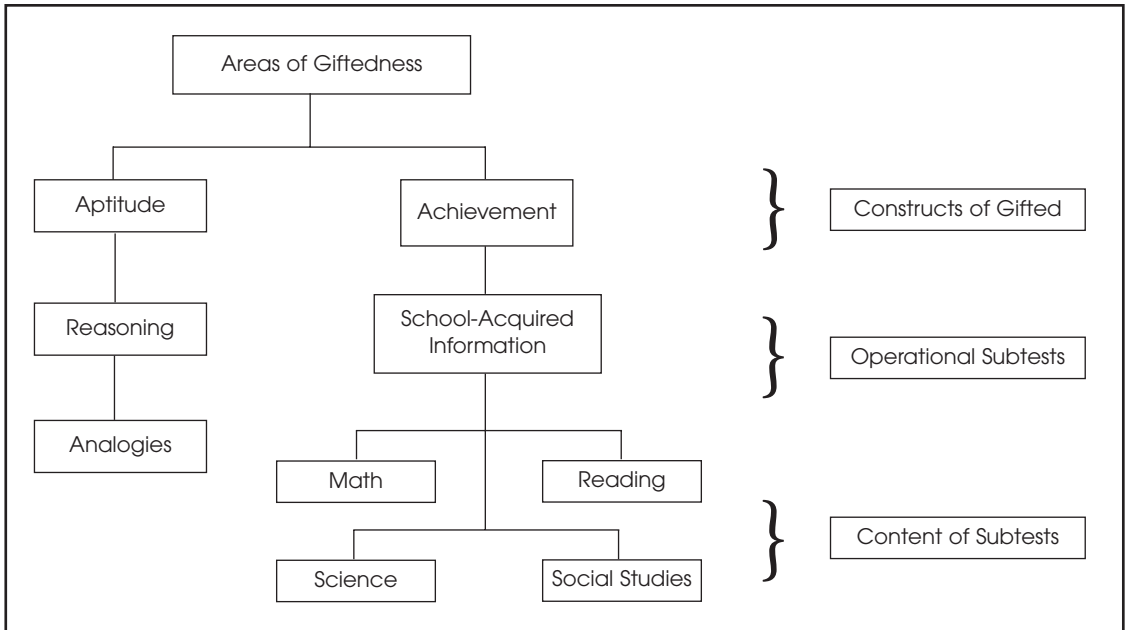


Figure 1.5. SAGES-2 schema.

Description of the Subtests

The three subtests that make up the SAGES-2 are described briefly in this section. Detailed justification for the selection of formats, contents, and rationales are discussed in the Content-Description Validity section of Chapter 6; administration and scoring procedures are presented in Chapter 2; and guidelines for interpreting scores obtained on the SAGES-2 are described in Chapter 3.

Subtest 1: Mathematics/Science This subtest samples achievement in mathematics and science. Achievement refers to what a child has acquired through formal and informal educational experiences. Because most programs for gifted students address achievement, these items reflect knowledge in the two (of four) core academic areas whose foundation is more logical or technical in nature.

This subtest requires the child to respond to questions in a multiple-choice format. The content for this subtest was drawn from current texts, professional literature, books, and the national standards in mathematics and science. Items require recall, understanding, and application of ideas and basic concepts in these content areas.

Subtest 2: Language Arts/Social Studies This subtest samples achievement in language arts and social studies. These items reflect knowledge in the two (of four) core academic areas whose foundation is more linguistic in nature.

This subtest is structured similarly to Subtest 1, requiring the child to respond to questions in a multiple-choice format. The content for Subtest 2 was drawn from current texts, professional literature, books, and the national standards in language arts and social studies. Items require the students to recall, understand, and apply ideas and basic concepts.

Subtest 3: Reasoning The Reasoning subtest samples one aspect of intelligence or aptitude—problem solving. Cattell (1963) defined aptitude as successful adaptation in situations in which previously learned skills are of no advantage. Although situations may vary from adaptation in school to adaptation on the job or in independent living, the Reasoning subtest was designed to estimate a child's capacity to learn the kinds of information necessary to achieve in programs designed for the gifted.

This subtest requires the child to solve new problems by identifying relationships among figures and pictures. The items are presented in an analogy format, the child must recognize pictures or figures, deduce relationships, and then find other pictures or figures that relate to the stimulus in the same manner. Relationships may vary in one or more attributes, associations, and/or meanings. This subtest examines a sample of the child's ability to perceive new relations and learn new tasks since the content is not related to abilities formally taught in school.

Although an infinite number of items have been designed to measure intelligence, analogies have been extremely popular because of their strength in discriminating among abilities. In the past Spearman (1923) used analogies as the prototype for intelligent performance. These tasks are also currently used by Piagetian and information-processing theorists of intelligence since they require the ability to see "second-order relations" (Sternberg, 1982, 1985b; Sternberg & Rifkin, 1979). Analogies also incorporate many of the behaviors associated with intelligence, such as classification, discrimination, induction, deduction, and detail recognition (Salvia & Ysseldyke, 1998).

Uses of the SAGES-2

The SAGES-2 has four principal uses: (1) to identify students as gifted in the areas of intellectual and academic ability, (2) to screen entire pools of students for possible inclusion in gifted programs, (3) to examine strengths and weaknesses in academic and reasoning abilities, and (4) to serve as a measurement device in research studies investigating intellectual and academic ability in gifted students.

First, the results of the SAGES-2 are useful in identifying children for gifted classes emphasizing aptitude and achievement. The SAGES-2 is not intended for identifying children for classes emphasizing talents in creative, artistic, or leadership areas.

Second, the SAGES-2 may be used as a screening instrument for the entire pool of students being considered for the gifted program or as a second-level screening instrument for only the nominated group. The SAGES-2 provides norms for two groups of students, those in general education classes (normal norms) and those identified for gifted programs (gifted norms). Borderline children may be more accurately identified using the gifted norms.

Third, the SAGES-2 may be used clinically to examine a child's relative strengths and weaknesses in the constructs incorporated into the test. In this way, children's aptitudes are not hidden because they have not acquired the information necessary for scoring well on an achievement test.

Fourth, the SAGES-2 has value as a research tool, especially for researchers who need standardized instruments to study behaviors of gifted learners. Its results can be used to test various theories of giftedness, to measure the relationship of reasoning and achievement to future school or vocational success, and to determine the effectiveness of various intervention programs.

