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Giftedness in the Euro-American Culture

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The first author was recently conducting psychological research at a sixth-form college (which takes in students who are in their last 2 years of secondary education) in England. During a break from testing, he asked a few teachers what they thought about giftedness and how it should be assessed and nurtured. The teachers seemed quite perplexed and asked the author to define what he meant by giftedness. The author remarked that there surely must be some criteria they use to define giftedness in England. The teachers responded that they weren't familiar with the term. They then explained their system of education.

Compulsory education ends at age 16 years. Those who wish to continue on to higher education can join a sixth-form college for 2 years, during which they can choose to specialize in a number of particular areas, master their A-level exams (which are measures of achievement, similar to the SAT IIs in the United States), and apply to university. The author asked what sort of test is required for entry into most of these sixth-form colleges. The response was simply, "No test, just the desire to pursue higher education and a willingness to work hard."

It was at this point that the author realized just how egocentric he had been to ask such questions. He had been in the United States for so long that he had gotten used to the prevalence of tests of intellectual potential. In the United States, normally starting at a very early age, standardized tests are given to students to judge their potential for school performance. Those students who score above a certain cutoff may be labeled as gifted and given special services. Even if students display high levels of achievement and motivation, it may be difficult to enter a gifted education program if identification on the basis of IQ is not made early on. Students hoping to go on to college take either the SAT (an acronym that originally stood for Scholastic Aptitude Test, then for Scholastic Assessment Test, and now for nothing in particular) or the ACT (American College Test). Most of the prestigious universities have an SAT or ACT cutoff or at least guidelines, which weigh the SAT or ACT heavily. Even beyond undergraduate studies, tests of abstract reasoning potential are usually required to continue forward. For instance, students hoping to enter law or medicine have to take tests that have a strong general abstract reasoning component to them. In addition to displaying high achievement in undergraduate studies, those applying to graduate school in the arts and sciences must also take the Graduate Record Examination (GRE) that, in addition to verbal and math achievement, measures general reasoning ability. Tests administered with the aim of identifying those of high intellectual ability seem to be everywhere in the United States.

This is not necessarily a bad thing. The identification and nurturing of high ability is arguably one of the highest priorities a culture should have. The way a society identifies and cultivates talent has important ramifications for the progress of that society. Because so much is at stake, it is important to understand what exactly is meant by the concept of giftedness and to critically look at how giftedness is defined, measured, and developed.

The aim of this chapter is to show the uniqueness of the U.S. approach to giftedness by presenting an overview of the development of gifted education, including the various modern conceptions of giftedness that have been put forward and their implications for the identification and nurturance of the gifted.

ORIGINS OF MODERN AMERICAN CONCEPTIONS OF GIFTEDNESS

How did gifted education in the United States become what it is today? Current gifted education practices and conceptions of giftedness must be viewed through the lens of the past. The early theorizing and construction of intelligence tests by Europeans such as Galton, Binet, Spearman, and Thurstone have had an important influence on the United States, once their ideas about

intelligence and how to measure it were adopted. An understanding of which ideas were adopted and in what form is necessary to put current conceptions and practices in their proper context. What follows is a summary of the important people and events of the past 150 years that contributed to the formation of the modern landscape of gifted education in the United States.

Euro-American Influences

The ideas presented in Francis Galton's book *Hereditary Genius* (1869) had an important influence on subsequent thinking about giftedness. In *Hereditary Genius*, Galton used the word *genius* to denote "an ability that was exceptionally high and at the same time inborn" (Galton, 1892, p. viii).

How did Galton arrive at this conclusion regarding the nature of genius? He collected data on distinguished European men by looking at obituaries in the *London Times* newspaper. He then examined their family lineages. Because eminence appeared to run in families, Galton concluded that genius must be genetically inherited, just like physical characteristics. It is important to note that Galton measured genius through overtly subjective indices such as enduring reputation (which according to Galton consisted of a positive contemporary reputation revised by posterity). He therefore estimated eminence and did not attempt to measure genius directly through the use of psychometric tests. Even though Galton devised tests of mental ability, he never actually used his instruments to understand the nature of genius or to predict its emergence in young people (Tannenbaum, 1986).

At the turn of the 20th century, an English psychologist, Charles Spearman (1904), noticed that tests that purported to measure intelligence tended to intercorrelate positively with each other. He invented a statistical technique called factor analysis, which allowed him to identify two specific factors that contributed significantly to the variance on intelligence tests. According to Spearman, the general factor, *g*, allegedly pervades all tests of mental abilities, whereas specific factors *s*, are each only limited to a single test. Spearman viewed *g* as a mental energy and postulated that it had a strong physical basis. The search for the physical basis of *g* is still an active research topic today (Neubauer & Fink, 2005). Researchers investigating the biological basis of *g* study the relationship between intelligence and speed of information processing (Deary & Stough, 1996; Jensen, 1998) as well as the relationship between intelligence and various brain processes (Detterman, 1994). The statistical discovery and underlying assumption by Spearman that the *g* factor is general and innate (i.e., has a strong physical substrate) is in line with Galton's theorizing on the hereditary basis of genius.

Some prominent intelligence researchers during this time disagreed as to the importance of the *g* factor for predicting performance on cognitive ability tests. One of the first researchers to oppose *g* theory was Louis Thurstone.

Like Spearman, Thurstone used the method of factor analysis to understand the intercorrelations found on tests of cognitive ability. However, he believed it was an error for Spearman to leave the axes of factorial solutions unrotated. Instead, he developed a method of rotation called simple structure. Using this method, factor loadings were forced to be either relatively high or relatively low. Thurstone analyzed data from 56 different tests of mental ability by rotating factor axes to simple structure and concluded that the general factor was not as pervasive as Spearman thought it to be. He identified seven primary mental abilities (Thurstone, 1938):

1. Verbal comprehension (involved in the ability to understand verbal material)
2. Verbal fluency (involved in the ability to rapidly generate a large number of words with specific characteristics)
3. Number (involved in rapid arithmetic computation)
4. Perceptual speed (involved in rapid recognition of symbols)
5. Inductive reasoning (involved in reasoning from the specific to the general)
6. Spatial visualization (involved in mentally visualizing and rotating objects)
7. Memory (involved in remembering information)

Around the same time as Spearman was formulating his so-called two-factor theory (representing *g* and *s* factors), a commission was appointed by the French minister of education to create a way to identify students in need of alternative education. Alfred Binet, an active member of the French group, developed his mental scale to achieve the goal of the commission.

The Binet-Simon scale comprised a variety of tasks that were thought to be representative of a typical child's ability at various ages. The purpose of the scale was to compare children's mental abilities relative to those of their normal peers (Siegler, 1992) and to "measure the intellectual capacity of a child who is brought to us in order to know whether he is normal or retarded" (Binet & Simon, 1916). Also, Binet made it clear that he was interested only in the current condition of the child. He stressed the malleability of intelligence and did not presume to predict either the student's past history or future functioning.

It is important to note a few things here. First, the purpose of Binet's scale was to determine whether a child was normal or exhibited retardation. Nowhere in Binet's writings does he declare an interest in identifying those who are gifted. Second, Binet's conception of intelligence and the way to measure it differed quite a bit from Galton's (1869, 1892). Galton thought the best way to measure intelligence was through sensory-discrimination tasks,

whereas Binet thought it was more appropriate to assess higher level cognitive skills. In addition, Binet stressed the idea that intelligence is not entirely genetic and is malleable rather than fixed. This is in stark contrast to Galton's view of intelligence and genius as something largely constrained by genetics. Binet also believed that intelligence testing should be used only on children with comparable backgrounds (Siegler, 1992). This is important to note because many of the eminent individuals Galton used to study genius were from affluent family backgrounds.

America's Introduction to Intelligence Testing

Around the same time that Binet was developing his test of mental ability, business and civic leaders in the United States were facing the challenges of educating a rapidly diversifying population (Siegler, 1992). The intelligence tests that were being developed in Europe were seen as a way to make progress toward becoming a society in which success would be determined by talent and achievement, not just family background (Minton, 1988). During this time some researchers were also interested in using intelligence tests for eugenic means. This point will not be further discussed (see, Gould, 1996, for an in-depth discussion on the issue) because the point of this brief history is to trace the development of the concept of giftedness, not of eugenics. That intelligence tests have sometimes been used for destructive purposes is unfortunate and has probably contributed to the mistrust of intelligence tests, which is exhibited by many today. Even so, the misuse of intelligence tests does not negate the possible use of the tests or the important influences they had in the founding of gifted education in the United States.

Who were some of the key players in the testing movement? First, Henry Goddard brought the Binet-Simon scale to the United States and translated it into English. After using the test with children with mental retardation, he started distributing it widely across the United States (Zenderland, 1998). Goddard made no pretensions regarding his view of the nature of intelligence. He viewed intelligence as "a unitary mental process ... conditioned by a nervous mechanism which is inborn ... that is but little affected by any later influences except such serious accident as may destroy part of the mechanism" (Goddard, 1920, p. 1).

In 1892, Ellis Island in New York Harbor opened its doors to immigrants eager to settle and work in the United States. The peak year for immigration was in 1907, when more than one million hopeful immigrants arrived on Ellis Island. For these immigrants to gain entry into the United States, they had to prove that they were physically as well as mentally capable of adapting to the United States and of earning a living. Goddard came to Ellis Island in 1912 and used a revised version of the Binet-Simon test to screen the intelligence of immigrants. The number of immigrants who were deported increased greatly as a result of the measures (Zenderland, 1998).

Another use of the tests emerged immediately following the entry of the United States into World War I. Robert Yerkes chaired the Committee on the Psychological Examination of Recruits. The goal of the committee was to develop group intelligence tests that could differentiate Army recruits based on their level of intelligence (McGuire, 1994). Both Henry Goddard and Lewis Terman were members of the committee. The committee succeeded in constructing the Army Alpha and Beta tests, which were administered to more than two million men throughout the course of the war.

Even though Binet's tests were adapted for use in America, the spirit on which the tests were based seemed to be lost. Binet always emphasized the great diversity of intelligence and the need to study it using qualitative as opposed to only quantitative measures. Binet also stressed the variable rates at which intelligence developed, as well as the large impact of the environment. When Binet found out about the foreign ideas being grafted on his instrument, he condemned those who were promoting the concept of intelligence as a unitary, hereditarily fixed construct (White, 2000).

The United States' Adoption of Intelligence Tests for Use With Gifted Students

In none of the previous instances were the test administrators interested in identifying the gifted. This particular use would come to be associated with Lewis Terman, who modernized and Americanized the Binet-Simon test to create the Stanford-Binet Intelligence Scale (Terman, 1916).

Terman essentially adapted Galton's theory of genius and the instruments of Binet. It should be noted that, in the early stages of Terman's research, Terman equated giftedness with high IQ and expressed the view on many occasions that from high-IQ children "and no where else, our geniuses in every line are recruited" (Terman, 1924). Based on this line of thinking, a classification scheme was starting to be used in the schools whereby psychologists often described a student with an IQ score above 135 as moderately gifted (Terman, 1925), above 150 as exceptionally gifted, and above 180 as severely and/or profoundly gifted (Webb, Meckstroth, & Tolan, 1982).

Terman (1916) was specifically interested in studying gifted children and was the first person in the United States to use these new intelligence tests to identify gifted children. As for how these tests would be used, he suggested:

Teachers should be better trained in detecting the signs of superior ability. Every child who consistently gets high marks in his school work with apparent ease should be given a mental examination, and if his intelligence level warrants it he should either be given extra promotions, or placed in a special class for superior children where faster progress can be made. The latter is the better plan, because it obviates the necessity of skipping grades; it permits rapid but continuous progress. (p. 14)

Terman also became interested in understanding the developmental path of gifted children. In 1921, Terman initiated the first longitudinal study of giftedness. He administered the Stanford-Binet test to select a sample of more than 1,500 students who scored above 140. Terman wanted to find out if high-IQ children would on average achieve more success as adults than those with a lower IQ. His results largely confirmed his prediction. The children in his sample were found to be normal or superior in all aspects of intellectual, as well as physical, behavioral, and moral dimensions (Terman & Oden, 1947, 1959).

Another influential researcher who helped lay the foundation for gifted education in the United States was Leta Stetter Hollingworth. Her research suggested that not all gifted students are alike (Hollingworth, 1929, 1942). In particular, she showed that moderately and extremely gifted children have different developmental needs. According to her research, those scoring within the range of 125–155 on the Stanford-Binet were self-confident, outgoing individuals. However, those scoring above 180 (those scoring that high are literally one in a million) in her sample displayed various adjustment problems in school. Of particular note is her work demonstrating that the social isolation and other adjustment problems displayed by the exceptionally gifted disappeared once they received accelerated material and were put with students who matched their ability level. Hollingworth once commented, “In the ordinary elementary school situation, children of IQ 140 waste half their time. Those above IQ 170 waste practically all their time” (Hollingworth, 1942, p. 299).

In summary, the modern state of gifted education in the United States owes a great debt of gratitude to the early theorizing, test construction, and research on intelligence by Europeans in the first half of the 20th century. It would be these ideas and tests that were adopted by researchers in the United States for the purpose of identifying and nurturing the abilities of gifted students.

The *Sputnik* Era

Ever since the founding of the United States, the society has grappled for a balance between excellence and egalitarianism. A democracy that is too egalitarian runs the risk of weakening its commitment to excellence and losing its competitiveness in the global context. On the other hand, a democracy that is focused too much on excellence can compromise equality of status and opportunity and arouse serious civil unrest (Tannenbaum, 2000b).

The launching of the Russian satellite *Sputnik* in 1957 led to the generation of federal reports that criticized American education in general and gifted education in particular. It should come as no surprise which of the two ideals became the focus of attention during this era. Admiral Hyman

Rickover, father of the atomic submarine, warned that to compete on an equal footing America had to overcome its traditional guilt about singling out the gifted for special opportunities at school (Tannenbaum, 2000b).

In the schools of the late 1950s and early 1960s, a substantial amount of research emerged dealing with the characteristics and education of gifted children. French (1959) claimed that there were more articles published in the 3-year period from 1956 to 1959 than in the previous 30 years.

Also, Terman's longitudinal study started producing results, showing the potential of those who are identified as gifted at a young age. These longitudinal results were used as further evidence for the need to improve the state of gifted education in the United States.

All of this set off the great talent hunt of the post-*Sputnik* era, a time in which efforts from every level were made to identify gifted students and to educate them. The feeling during the early years of the Cold War was that gifted scientists were people who could help protect national security and that all efforts should be made to find them and nurture their talents. It is interesting to note that during this particular time period, a particular type of giftedness—scientific giftedness—was considered more worthy than any other type of giftedness. Therefore, historical events can have an important impact on which type of giftedness will receive the most support and nurturance.

Civil Rights Movement and Vietnam

As much as the pendulum swung to the side of excellence during the *Sputnik* era is as much as it swung to the side of egalitarianism during the 1960s and early 1970s. During this time, an interest in national issues such as creating freedom and equality within its borders became more of a priority than international issues.

Decreased interest in the gifted became prominent during the time of the civil rights movement, school integration, and compensatory education. Also, the Vietnam War spurred a lot of disenchanted youths to distrust scientific discovery and focus on improving society to combat social injustice. Furthermore, because there tended to exist gross underrepresentation of minority and female students in gifted education programs, interest in funding gifted education programs lost much of its momentum (Tannenbaum, 2000b).

The Influence of the Marland Report

In 1972, a major boost to gifted education would come with U.S. Commissioner of Education Sidney P. Marland, Jr.'s report on the deteriorated state of gifted education (Marland, 1972). He estimated that only a small percentage of the 1.5 to 2.5 million gifted school children were benefiting from special educational services. The report increased the awareness of the gen-

eral public that the needs of the gifted were being neglected. At the time, such services had low priority at virtually all levels of school administration.

The report also supplied a broadened definition of giftedness:

Gifted and talented children are those who demonstrate achievement and/or potential ability in any of the following areas:

1. General intellectual ability
2. Specific academic aptitude
3. Creative or productive thinking
4. Leadership ability
5. Visual and performing arts
6. Psychomotor ability (Marland, 1972, p. 10)

Psychomotor ability has subsequently been dropped from the list. Also, general intellectual ability has most often been interpreted to mean highly intelligent and is often operationalized as the top 3–5% of students as measured by intelligence tests (Abeel, Callahan, & Hunsaker, 1994).

The Marland report has been the target of various criticisms (Renzulli, 1978). One criticism is that the categories in the definition are independent of each other, resulting in the development of separate identification schemes for each category. Another criticism is the omission of nonintellective factors, such as task commitment.

Despite these criticisms, the Marland report was landmark in a few respects. First, it became the first federal definition of giftedness that included multidimensional criteria for the identification of the gifted. Second, it fueled the first legislative action for the gifted and talented. As much as \$2.56 million of federal money was allocated in 1974 for improving the state of gifted education in America. Third, as a response to the report, the National Office of the Gifted and Talented was established.

A more recent report was released by the National Department of Education in 1993 entitled *National Excellence: A Case for Developing America's Talent* (U.S. Department of Education, 1993). Just like the Marland report, this one presented a multidimensional conception of giftedness and reiterated the shortcomings of gifted education in America. Secretary of Education Richard Riley described the state of gifted education as the “quiet crisis” and remarked, “youngsters with gifts and talents that range from mathematical to musical are still not challenged to work to their full potential. Our neglect of these students makes it impossible for Americans to compete in a global economy demanding their skills” (p. iii).

MODERN CONCEPTIONS OF GIFTEDNESS

The Marland and National Excellence reports brought attention to the idea that gifted education in America may not be achieving its intended purposes.

This has led to the proliferation of new conceptions of giftedness and research over the past 25 years. However, just as there is great diversity among definitions of intelligence (Sternberg, 2000a, 2004a; Sternberg & Detterman, 1986), so is there much variation among modern conceptions of giftedness.

Some modern researchers have gone so far as to argue that the conception of gifted should be dropped altogether. According to Borland (2005), "The concept of the gifted child is logically, pragmatically, and—with respect to the consequences of its application in American education—morally untenable." He bases this conclusion on a few premises. First, he argues that the construct of the gifted child is a social construct of questionable validity, which is not supported empirically or logically. Borland's second premise is that current pull-out methods for gifted students have proven largely ineffective. His third premise is that the practice of gifted education has demonstrated unfortunate social and moral consequences. To address these issues, Borland advocates for a paradigm shift in gifted education in which the construct of gifted children is eliminated and students receive differentiated curriculum and instruction according to their demonstrated ability level. Hence, he argues for gifted education without gifted children. Along similar lines, Robinson (2005) feels that "the term gifted and the term talented has outlived its usefulness" because there is "little to no consensus about what constitutes these concepts."

Even so, there is some common ground in that most modern researchers believe in a conception of giftedness and have attempted to define the construct. In the following sections, we summarize eight conceptions of giftedness, presented chronologically, that have significantly influenced (and continue to influence) gifted education in the United States. This list is by no means meant to be exhaustive (see Sternberg & Davidson, 2005, for a more comprehensive listing).

Psychometric, Hierarchical Theories of Cognitive Abilities

Further analyses of intelligence test correlation matrices suggested that the early theorizing of both Spearman and Thurstone were partly right but also partly wrong. Because all mental ability tests correlate positively, factor analysis always yields a general factor. Even though this seems to support Spearman's view, in any large test battery there will be clusters of subtests that correlate more highly with one another than they do with other clusters. Therefore, Thurstone's group factors will also be found. The resulting compromise produced hierarchical theories of intelligence, which took into account the importance of both general and group factors. Two hierarchical theories that have had the most influence on modern intelligence tests are the Cattell-Horn model and Carroll's theory of cognitive abilities. Each one will be discussed in turn.

Early versions of the Cattell-Horn *gf-gc* theory proposed that general intelligence has two major parts: fluid intelligence (*gf*) and crystallized intelligence (*gc*) (Horn & Cattell, 1966). Fluid intelligence is thought to be dependent on the efficient functioning of the central nervous system, rather than on prior experience and cultural context. Crystallized intelligence, on the other hand, is thought to be more dependent on experience and cultural context. The *gf-gc* hierarchical model is a two-stratum model in which these two broad second-order factors make up the top stratum and more than 40 (including Thurstone's primary mental abilities) first-order factors make up the bottom stratum. The theory has more recently been expanded (Horn, 1994) to incorporate additional second-order factors. Among the list of additional second order factors are visual thinking (*gv*), auditory thinking (*ga*), and speed (*gs*).

The most recent hierarchical model of intelligence and the one that has arguably been the most widely accepted is Carroll's three-stratum theory (Carroll, 1993). Carroll proposed this model after an extensive analysis of more than 460 data sets from the psychometric literature. This model differs from that of the Cattell-Horn model in that it posits the need for a third stratum. Carroll places *g* at the top, in Stratum III. The middle stratum consists of eight broad abilities that are similar to the second-order factors in *gf-gc* theory. They include (in order of decreasing relatedness to *g*) fluid intelligence, crystallized intelligence, general memory and learning, broad visual perception, broad auditory perception, broad retrieval ability, broad cognitive speediness, and processing speed. Stratum I consists of highly specific abilities, some of which represent Thurstone's primary mental abilities. Therefore, Stratum I reflects highly specialized skills, Stratum II reflects somewhat specialized abilities that occur in broad domains of intelligent behavior, and Stratum III has only one ability, *g*, that underlies all aspects of intellectual activity.

Recently, Carroll's model and the Horn-Cattell model have been synthesized into the Cattell-Horn-Carroll (CHC) theory (Flanagan & Harrison, 2005). Even though the CHC model still incorporates a *g* factor, its main emphasis is on the measurement of middle stratum factors. The CHC theory has been influential in the development of the fifth edition of the Stanford-Binet (Roid & Barram, 2004), the second edition of the Kaufman Assessment Battery for Children (KABC-II; Kaufman, Lichtenberger, Fletcher-Janzen, & Kaufman, 2005), and the third edition of the Woodcock-Johnson Cognitive Abilities Assessment (WJ III; Mather, Wendling, & Woodcock, 2001).

Because hierarchical theories of intelligence view all of the different aspects of intelligence as being related to a common *g*, they are the most domain-general of all contemporary models of giftedness. In addition, they incorporate a vast number of factor-analytic results. As a result, they have en-

dured the longest and probably are the most valid. (Reasons for the popularity of the intelligence models of giftedness are further discussed in “Implications and Issues” section later in this chapter.) However, it must be noted that these models are intended to represent the factor-analytic structure of human intelligence, not of giftedness. Therefore, they do not specifically address the additional factors, such as creativity, motivation, and environment that other contemporary theories of giftedness address.

Julian Stanley’s MVT:D⁴ Model of Giftedness

Professor Julian Stanley’s experiences with precocious youth led him to establish the Study of Mathematically Precocious Youth (SMPY) at John Hopkins University in 1971. The purpose of SMPY is to identify youths with precocious math ability and to help find the educational resources they need to achieve their full potential. The success of SMPY has led to similar programs geared toward students who exhibit exceptional verbal, spatial, and mechanical reasoning as well as other specific abilities (McGin, 1976; Shea, Lubinski, & Benbow, 2001; Stanley, 1994).

The talent search was expanded in 1979, when a special center at John Hopkins was created—the Center for Talented Youth (CTY). CTY started by offering the SAT to seventh graders nationwide, and as a result of the tremendous success and popularity of the program, today approximately 85,000 second through eighth graders throughout the world participate in the talent-search program annually (Barnett & Juhasz, 2001).

As a result of all this work, Julian Stanley formulated the MVT:D⁴ model of giftedness, which stands for building on Mathematical and/or Verbal Talent through Discovery, Description, Development, and Dissemination (Brody & Stanley, 2005). The Discovery stage refers to the identification of talent through annual searches. The Description stage refers to the assessment of individual characteristics that help to evaluate programmatic interventions. The Development stage refers to providing gifted students with the programs that will allow them to develop their potential more fully. This has so far taken the form of challenging summer courses and distance learning. The Dissemination stage refers to sharing the principles, practices, and research results by means of publications, consultations with schools, and e-mail correspondence.

This conception of giftedness focuses on specific areas of aptitude and the needs of those who are precocious in those areas through the accelerating of subject matter. Therefore, Stanley’s work has made an important contribution by allowing precocious children to receive the resources they require to progress at an advanced rate. Like the hierarchical modelers, Stanley does not include additional factors such as creativity that may lead to giftedness, nor does he see them as necessary. In his view, true creative production can

only come about after a significant amount of content has been mastered. In fact, Stanley chooses to avoid the word *gifted* in favor of *precocious*. Therefore, Stanley's work is limited to developing one important aspect of giftedness—childhood or schoolhouse giftedness.

Joseph Renzulli's Three-Ring Definition

Joseph Renzulli's three-ring definition views giftedness as something that develops in certain people, at certain times, and under certain circumstances. This view of giftedness is very similar to Binet's original conceptualization of intelligence (see section titled "Origins of Modern American Conceptions of Giftedness" earlier in this chapter).

Renzulli (2005) defines two types of giftedness: schoolhouse giftedness and creative-productive giftedness. Schoolhouse giftedness is test-taking or lesson-learning giftedness and is the form of giftedness most often emphasized in school. According to Renzulli, because scores on IQ tests and other measures of cognitive ability account for only a limited proportion of the common variance with school grades and real-world creative productivity, it is necessary to posit a creative-productive form of giftedness. Creative-productive giftedness differs from schoolhouse giftedness. Those who display creative-productive giftedness are excellent producers of knowledge, whereas those high in schoolhouse giftedness are superior consumers of knowledge. According to Renzulli, "History tells us it has been the creative and productive people of the world, the producers rather than consumers of knowledge, the reconstructionists of thought in all areas of human endeavor, who have become recognized as 'truly gifted' individuals. History does not remember persons who merely scored well on IQ tests" (Renzulli, 2005, p. 256).

Like Stanley, Renzulli reserves calling a child gifted until the child actually displays superior performance in a field. Also like Stanley, he believes that traditional achievement is a necessary but not sufficient condition for creative production. However, whereas Stanley focuses on developing schoolhouse giftedness, Renzulli has chosen instead to focus also on the traits that define creative-producers. By focusing on the development of creative-productive giftedness, Renzulli aims to increase the chances that more students will become creative in a way that will have an impact on others and cause a change in the real world.

Based on his distinction between the two types of giftedness, Renzulli proposed the three-ring definition, which asserts that the creative-productive gifted individual possess three interactive clusters of traits: well-above-average ability, creativity, and task commitment. According to Renzulli, each cluster plays an important role in the development of gifted behaviors. Well-above-average ability is defined by Renzulli as either gen-

eral ability that can be applied across all domains or specific ability, which consists of the ability to perform at a high level within a specific domain. Renzulli defines above-average ability as that possessed by those individuals performing in the top 15–20% of any domain. This view differs from the traditional view of giftedness as comprising those scoring in the top 3–5% on a standardized measure of intelligence (i.e., Marland, 1972).

Renzulli's model benefits from its inclusion of multiple interacting factors and the broadening of criteria used in selection of gifted students. However, the model does have some notable limitations. First, Renzulli first proposed the three aspects of giftedness based on data from accomplished adults (Renzulli, 1978). Renzulli has been criticized for not demonstrating correlations between these later-life achievements and the traits or experiences of children with various levels of IQ (Delisle, 2003). Another criticism of the model is that motivation, task commitment, and creativity should be secondary considerations because they are not part of giftedness but rather are born out of the talent-development process (VanTassel-Baska, 2005). A response to various criticisms can be found in a recent issue of *Journal for the Education of the Gifted* (Renzulli, 1999).

Howard Gardner's Model of Multiple Intelligences

In 1983, Howard Gardner published his first edition of *Frames of Mind*, which became extremely popular among some educators. This and subsequent editions of his book (Gardner, 1983, 1993, 1999) described the multiple intelligences model of intellectual ability, which stressed the need for educators and psychologists to broaden their definitions of human intelligence.

Gardner defined intelligence as “an ability or set of abilities that permit an individual to solve problems or fashion products that are of consequence in a particular cultural setting” (Ramos-Ford & Gardner, 1997, p. 55). He based his conclusions on a selective analysis of the research literature using eight criteria:

1. Potential isolation by brain damage
2. The existence of idiot savants, prodigies, and other exceptional individuals
3. An identifiable core operation or set of operations
4. A distinctive development history
5. An evolutionary history and evolutionary plausibility
6. Support from experimental psychological tasks
7. Support from psychometric findings
8. Susceptibility to encoding in a symbol system

Gardner concluded that there were eight separate intelligences.

The eight intelligences he proposed are linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal, and natu-

ralist. Additional intelligences are currently being considered, such as existential intelligence.

Howard Gardner's theory is largely domain specific in the sense that Gardner highlights certain domains in which each of his intelligences is most important. However, his theory also has a domain general component because many of his intelligences can apply to a variety of different domains and in different combinations (Connell, Sheridan, & Gardner, 2003).

Even though Gardner's theory has had an important influence in the broadening of educators' views of intelligence, various criticisms have been proposed. First, there currently exists no published empirical test of the theory as a whole. Second, the intelligences that Gardner proposes are based on selective literature that supports his hypothesis. Also, the literature he used is distinctly different from the psychometric literature, which was specifically designed to test psychometric theories of intelligence. Third, even though assessments exist to test the various intelligences (e.g., Gardner, Feldman, & Krechevsky, 1998), they have not proven to be psychometrically valid. There is some evidence to suggest, however, that they are of acceptable reliability (Plucker, Callahan, & Tomchin, 1996). Without valid tests though, it is difficult to evaluate the success of interventions. Lastly, it is not clear that the different intelligences are truly separate from one another and that each serves an independent adaptive function.

Abraham Tannenbaum's Psychosocial Definition

Abraham Tannenbaum proposed a psychosocial definition that synthesizes a large amount of literature on the contributing factors linking the promise to the fulfillment of giftedness. In presenting his psychosocial definition of giftedness, Tannenbaum made a clear distinction between child precocity and adult giftedness (Tannenbaum, 1986). He argues that children cannot be evaluated on universal criteria of giftedness (such as that judged by an adult expert in a field) but must only be compared with others of their age. According to Tannenbaum, early schooling is reservedly for consuming knowledge, whereas producing knowledge comes later in a person's growth cycle.

For the student with great potential to become a producer of knowledge, his or her internal qualities need to interact with external conditions. Tannenbaum proposed five psychological and social links between promise and fulfillment. They are superior intelligence, exceptional special aptitudes, nonintellective facilitators, environmental influences, and chance, or luck. These five factors are posited to interact to produce high levels of productivity, and all are necessary to become truly outstanding. Tannenbaum also notes that specific areas of excellence vary in the extent to which each of the five factors is important.

Tannenbaum's theory is helpful in synthesizing a large amount of literature to further clarify the factors linking childhood and adulthood giftedness. The theory is purely theoretical, however, and no efforts have been made to test the theory as a whole.

François Gagné's Differentiated Model of Gifted and Talented

François Gagné noted that the words *gifted* and *talented* are often used interchangeably (i.e., Marland, 1972) in the field of gifted education. He uses the idea that the two words have independent meanings as a basis for his differentiated model of gifted and talented (DMGT). The DMGT is developmental in nature. It posits that talent development corresponds to the transformation of outstanding natural gifts into the skills characteristic of a particular occupational field (Gagné, 2005). Gagné argues that giftedness (or aptitudes) can be described as natural ability in a particular domain, whereas talent (or achievement) is systematically developed skills in a particular talent field (Gagné, 1999). According to the model, natural abilities or aptitudes act as the raw material, or the constituent elements of talents (Gagné, 1993). Gagné posits that those who belong to approximately the top 10% of the relevant reference group in terms of aptitudes (for giftedness) or achievement (for talent) merit the label gifted or talented. Gagné also stresses the importance of identifying different levels of giftedness, pointing to the research showing that extraordinarily gifted children (children in the top 0.001% of the population) have different needs than mildly gifted children (those in the top 10% of the population). This is in line with the early research by Hollingworth (1929, 1942), showing the differences between mildly and extraordinary gifted students as measured by the Stanford Binet (see section titled "Origins of Modern American Conceptions of Giftedness" earlier in this chapter).

On the giftedness side of the model, Gagné defines four aptitudes that have a clear genetic substratum and can be observed in every task children are confronted with in school because environment and learning have not exerted much influence on them yet. These aptitudes are intellectual, creative, socioaffective, and sensorimotor. On the talents side are systematically developed skills such as academics, leisure, technology, arts, social action, business, technology, and athletics.

During the course of the development of gifts into talents, the DMGT consists of four components that help represent the talent-development process. These include four catalysts: intrapersonal catalysts, environmental catalysts, chance, and learning/practice. Catalysts are defined as elements that contribute to the final gifted product. They also vary in the degree to which they make a positive or negative contribution to the final product and make a causal impact on the developmental process.

Intrapersonal catalysts include six parallel subcomponents: physical characteristics, motivation, volition, self-management, personality, and self-man-

agement (Gagné, 2003). Environmental catalysts exert their positive or negative impact in many different ways. The DMGT makes a distinction between four distinct environmental inputs. They include the milieu, persons, provisions, and events. Chance factors are included in the DMGT as an important catalyst for talent development. For instance, chance manifests itself in the socioeconomic environment in which children are born, the quality of parenting they receive, or in the transmission of hereditary characteristics.

Learning and practice have to do with the strong relationship between the traditional definition of expertise (Ericsson, 1996) and the DMGT's conception of talent. Learning and practice are posited to take four different forms: maturation, informal learning, formal noninstitutional learning, and formal institutional learning (Gagné, 2005).

The DMGT makes a strong contribution to the field of gifted education for a number of reasons. First, it helps clarify the definitions of giftedness and talent, two terms that have often been used synonymously in the field. Second, the model incorporates a great number of factors that serve as catalysts in the development of talents from gifts.

As is the case with any theory of giftedness that incorporates many factors and a large literature, the theory is not without its critics. Some researchers have criticized the model as being an oversimplification. Simonton (2004) points to the need for the model to incorporate the literature on how factors, components, and processes change over time. Other researchers have observed the complexities in distinguishing between natural abilities and systematically developed skills (Baer & Kaufman, 2004; Dai, 2004; Porath, 2004), even suggesting that for all practical purposes, talent and giftedness indeed are equivalent (Guenther, 2004). A third major criticism is that the prevalence estimates proposed by the theory seem arbitrary (Baer & Kaufman, 2004; Feldhusen, 2004). A fourth major criticism is that the absolutist conception of giftedness should be replaced with a more relativistic conception. According to Porath (2004), Gagné emphasizes an absolutist conception of giftedness in which a child is either gifted or not gifted. This is in contrast to a relativistic conception of giftedness, in which the question is not "Is the child gifted?" but rather "Is there an appropriate match between the child and the programme, and if not, what needs to be done to make the program appropriate?". Note the similarity in thinking between Porath and Borland. Borland, however, takes things one step further by suggesting the need to do away with a conception of giftedness altogether, presumably because any conception of giftedness will be an absolutist one.

David Feldman's Developmentalist Position

Through his studies of prodigies, David Henry Feldman has decided that creativity is an important aspect of giftedness and is best studied through a

multidimensional, interactive, and developmental perspective. Creative accomplishment, after all, is nothing if not a developmental shift, a significant reorganization of knowledge and understanding, which can lead to changes in product, ideas, beliefs, and technologies. Creativity is a quintessentially developmental matter (Feldman, 2000).

Feldman noted that the scope of creativity research is exceptionally broad and proposed seven dimensions of development that all contribute to the development of giftedness: cognitive processes, social/emotional processes, family aspects (i.e., birth order and gender), education and preparation (informal and formal), characteristics of the domain and field, social/cultural contextual aspects, and historical forces, events, and trends (Feldman, 2000). This is more of a position than a complete testable theory. Nevertheless, Feldman's extensive review of the developmental and creativity literature makes a significant contribution to the field of giftedness.

Sternberg's WICS Model of Giftedness

One of the most active research centers on giftedness in the United States is that of the PACE (Psychology of Abilities, Competencies, and Expertise) Center, directed by Robert Sternberg. The model underlying the PACE Center's research on gifted education is the WICS model (Sternberg, 2003). The WICS theory is domain general in nature, in that the aspects are not tied to a particular domain, but are thought to cut across many different domains of learning.

According to the WICS model of giftedness, (w)isdom, (i)ntelligence, and (c)reativity are all necessary components but need to be (s)ynthesized to achieve giftedness. Sternberg argues that without these three attributes, someone can be a decent contributor to society, but never a great one (Sternberg, 2003, 2005).

The first component, wisdom, is defined as the application of intelligence and creativity as mediated by values toward the achievement of a common good through a balance among (a) intrapersonal, (b) interpersonal, and (c) extrapersonal interests, over the (a) short and (b) long terms, to achieve a balance among (a) adaptation to existing environments, (b) shaping of existing environments, and (c) selection of new environments (Sternberg, 2005). According to Sternberg, the wise individual must balance various self-interests (intrapersonal) with the interests of others (interpersonal) and of other aspects of the context in which one lives (extrapersonal). Note here the similarity to Kohlberg's (1969) fifth stage of moral reasoning, in which the individual's moral decision is based on what results in the greatest good for the greatest number of people. Without wisdom, Sternberg believes the gifted individual may apply his or her intelligence to achieve wholly selfish ends. To be fully worthy of the label *gifted*, the individual needs to seek out-

comes that achieve the common good. However, individuals can be gifted in any one or two of the three components, or even in the three but without being able adequately to synthesize them.

Tannenbaum (2000a) also recognized that the gifted individual can use his or her talents for good or evil. Like Sternberg, he argues for the need to teach moral reasoning to schoolchildren and encourages gifted children, when they become adults, to use their talents for the good of society. Tannenbaum uses the term *rogue's gallery* to describe people such as Adolph Hitler and Joseph Stalin, who achieved greatness while living evil lives. He emphasizes the importance for students of learning about these people and remembering them in infamy for the rest of their lives.

The second component, intelligence, is based on the theory of successful intelligence, according to which intelligence is defined as the ability to achieve success in life by capitalizing on strengths and correcting or compensating for weaknesses to adapt to, shape, and select environments through a balance of analytical, creative, and practical abilities (Sternberg, 1985, 1997, 2000b, 2002). Analytical intelligence is required to solve problems and to judge the quality of ideas. Creative intelligence is required to formulate good problems and solutions. Practical intelligence is needed to use the ideas and analysis in an effective way in one's everyday life.

The third component of the WICS model, creativity, is based on the investment theory of creativity, which views creativity largely as a decision (Sternberg, 2003; Sternberg & Lubart, 1995, 1996). Creative individuals generate ideas that are initially undervalued and may be rejected by the public. After convincing other people of an idea's value, the creative person will then sell high by leaving the idea to others and moving on to another idea. Also, because creativity is viewed largely as a decision, strategies to develop creativity have been proposed (Sternberg & Grigorenko, 2000). The list of strategies includes (but is not limited to) redefinition of problems, questioning of assumptions, willingness to surmount obstacles, willingness to take sensible risks, tolerance of ambiguity, and self-efficacy.

The different components of the WICS model have been studied in a number of educational and cultural settings, with promising results. Even though research into the wisdom component is relatively recent (Sternberg, 1998), the most extensively researched component is the successful-intelligence component, which shows particular promise in the identification and education of gifted students, even minority students and those coming from lower socioeconomic backgrounds (see "Implications and Issues" section).

The WICS model has received various criticisms (see Sternberg, 2004b, for a response to these criticisms). One criticism is that the WICS model does not address the relationship between creativity and psychiatric disorders (Dai, 2003; Kaufman & Baer, 2003). Another criticism is that the WICS model doesn't specify prediction of all aspects of all kinds of

giftedness, such as elite athleticism (Baker & Cote, 2003). Another criticism is that the WICS model does not provide a readily purchasable detailed assessment procedure for identifying or instructing gifted children (Feldhusen, 2003; Heller, 2003). Last, the construct of wisdom has been called overloaded and heterogeneously operationalized (Heller, 2003).

IMPLICATIONS AND ISSUES

The history of gifted education as well as modern conceptions of giftedness all have important implications for how business is currently conducted in the schools in the United States. Most of the implications are represented by various issues that have been a hot topic of discussion and debate throughout the history of gifted education. Some of these issues remain even today. Four such highly interrelated issues are discussed in the following sections.

Childhood and Adulthood Giftedness

Doing easily what others find difficult is talent; doing what is impossible for talent is genius.—Henri-Frédéric Amiel

Twenty years ago, Siegler and Kotovsky (1986) noted the division between research conducted on gifted children and research conducted on gifted adults. Today, discussions still ensue regarding the notable differences observed between childhood and adulthood giftedness, also conceptualized as the difference between giftedness and genius (e.g., Jensen, 1996; Simonton, 2000).

Most contemporary models of giftedness explicitly take into account the division between childhood giftedness and adulthood giftedness. Renzulli distinguishes between schoolhouse giftedness (which is obviously most important during the grade-school years) and creative-productive giftedness (which is most important for adult, real-world achievement). Tannenbaum notes the distinction between those who are consumers of knowledge (such as schoolchildren) and those who are producers of knowledge (such as gifted adults). Gagné makes the distinction between giftedness (which can be conceptualized as childhood potential) and talent (which may be conceptualized as adulthood achievement). Even Sternberg's theory of successful intelligence differentiates between analytical intelligence (the type of intelligence valued most highly in a school setting), on the one hand, and the combination of analytical, creative, and practical intelligence, on the other. The last of these is postulated to be required for success in the real world.

Even though most contemporary giftedness researchers at least acknowledge the difference between the two types of giftedness, there is a bit of disagreement along a few lines that muddy the water in the field. One line of

disagreement is whether giftedness is childhood potential, adulthood achievement, both, or neither. Researchers such as Sternberg and Feldman view creativity as adult achievement. Sternberg does not believe that someone is fully worthy of the label *gifted* unless he or she synthesizes wisdom, intelligence, and creativity. Because these three abilities probably do not fully develop until adulthood, Sternberg's theory seems to view giftedness as achievement. Indeed, Sternberg believes that all abilities are achievements, at some level. To Feldman, creativity is part and parcel of giftedness, and therefore truly gifted behavior is that which fundamentally reorganizes a field. On the side of potential are researchers such as Gagné, who explicitly defines giftedness as the potential, provided by genes, to master talents. Researchers such as Renzulli acknowledge the importance of both schoolhouse and creative-productive giftedness. Last, researchers such as Stanley have decided to abandon the label of giftedness entirely and to replace it instead with the notion of precocious youth.

Another line of disagreement is how, exactly, the childhood and adulthood giftedness pie is divided. Not all researchers who study talent development cut up the pie in the same way. Researchers such as Renzulli, Gagné, and Tannenbaum essentially make a two-way distinction between those with potential and those who are achieving at a very high level. They are interested in the factors linking one to the other. Other researchers have decided to cut up the talent development pie into more pieces. Subotnik and Jarvin (2005) view giftedness as consisting of three stages—two stages of childhood giftedness and one stage of adulthood giftedness. The first stage consists of the transformation of ability into competence in a domain. The middle stage involves older school-aged children who have demonstrated precocious achievement of expertise. Their last stage consists of scholarly productivity or artistic contribution and is the stage potentially achieved by adults performing in a domain that is judged by universal standards of excellence. Cross and Coleman (2005) also cut up the childhood pie into two pieces—an earlier childhood stage consisting of potential and a later childhood stage consisting of achievement.

Whether childhood giftedness is divided into separate stages or not has important implications for identification. That intelligence test results are relatively stable has often been used as a reason why students are rarely retested over the course of their schooling. Oftentimes, the scores children receive on an intelligence test when they are just starting school determine whether or not they will receive gifted education support throughout their entire 12 years of schooling. However, the talent development research that divides childhood giftedness into two stages brings with it the implication that children should be continually reassessed through their school years. Perhaps the criteria for entrance into a gifted education program at one age are not appropriate criteria for an older age. If further research supports the

need to differentiate different stages in the development of talent during the childhood years, then the criteria that may be valid for entrance into a gifted education program during the elementary and middle school years (e.g., results of a standardized intelligence test) may have to be different from the criteria that are required for entry into gifted education during high school, where actual achievement may have to take priority over ability.

Childhood giftedness and adulthood giftedness are judged by a different set of criteria. Context is the key to this distinction. Childhood giftedness is associated with high performance relative to other students of the same age. This performance can take the form of either a test of potential at a young age or a test measuring acquired knowledge in the classroom at a later school age. Adulthood giftedness is often judged by universal standards in a field. Once an individual leaves school, a high score on a standardized intelligence test or the ability to learn at a faster rate may increase an individual's chances of achieving eminence in a particular field, but it is not enough in itself to achieve adulthood giftedness status. For the child in a school context, however, it is enough to be classified as a gifted child.

The field needs a few things to improve our understanding of both types of giftedness and how one develops into the other. First, researchers should be clearer about what type of giftedness they are referring to. Second, researchers should be clearer as to what type of achievement they are referring to. Not all achievement is alike. In school, achievement is more closely associated with students' demonstrating their high expertise base in reference to a particular subject. In the real world, achievement is more closely associated with adults applying their expertise base in novel ways that are useful to society (a term that also requires a more precise definition!). Both types of giftedness are important. However, it will be beneficial to the field if it is acknowledged that initially demonstrated potential can take the form of high performance on a standardized measure of intelligence or a school achievement test. Both are important, but at the same time both are fundamentally different from what is often thought of as adult accomplishment.

The Identification of Gifted Students

Here's the reality: In the United States, standardized tests of intelligence are still the dominant criterion used for acceptance into gifted programs at the grade-school level (Abeel et al., 1994; Feldhusen & Jarwan, 2000; Tannenbaum, 1986). In fact, several states still prescribe a minimum score on an intelligence test to be eligible for funding (U.S. Department of Education, 1993). This reality has sparked considerable criticism, from psychologists to the public at large. The reliance on standardized tests of intelligence has important implications for how giftedness is defined and nurtured. Therefore, it is important to take a critical look at why the situation is the way it is.

First, measures of IQ are among the best predictors of academic achievement (Jensen, 1998; Walberg, 1984) and work performance (Gottfredson, 1997; Schmidt & Hunter, 1998, 2004) that are widely available. Therefore, when it comes to predicting childhood giftedness, IQ tests are potentially valuable. After all, standardized tests of intelligence measure at least some aspect of intelligence reasonably well, and intelligence is an important contributing factor to childhood and adult giftedness. Also, to the extent that certain real-world jobs require the same skills that are learned in school, there will be a high correlation between intelligence test results and work performance. Note, however, that the extant research generally links IQ to work performance, not eminence or creative productivity. In some fields of endeavor, a particularly high IQ may actually be detrimental. One particular mathematical model predicted that for those areas of accomplishment where a person must appeal to the masses (such as in leadership roles), the functional relation between IQ and effectiveness is curvilinear, with a maximum point around 119 (Simonton, 1985).

This poses a problem for contemporary definitions of giftedness that include an adulthood giftedness component. Clearly, adulthood giftedness includes more than just intelligence as measured by conventional tests. Intelligence plays a much more prominent role in school because school is a more restricted environment, one in which students with high intelligence can often do well on tests and achieve high grades without simultaneously displaying high creativity or even particularly high motivation for the subject.

To be sure, the original intelligence test constructors only intended on measuring childhood giftedness. Terman essentially adapted Binet's test of intelligence, which was formulated with the intention of finding students who would not benefit from normal education. Even though Terman practically equated high IQ with adulthood as well as childhood giftedness, the evidence from his own longitudinal study did not support this notion. Not every intellectually gifted child grew up to be an eminent adult, and differences in IQ could not discriminate between those who were successful and those who failed to realize their potential (Terman & Oden, 1959).

However, this makes the issue no less thorny. Even though most contemporary giftedness researchers emphasize the importance of looking beyond IQ for understanding the nature of giftedness, there are at least two probable reasons why educators still rely so heavily on the IQ measure. First, the majority of modern intelligence tests are based at least in part on the CHC theory, which has gained wide acceptance by psychometrically oriented intelligence researchers. This is in contrast to theories of giftedness, which differ remarkably along the actual dimensions that comprise giftedness. Are nonintellectual factors important? Is creativity important? Does an individual need to be wise to be gifted? Educators undoubtedly find it easier to administer a test based on a theory that is backed by years of factor-analytic

research rather than to have to pick and choose among the many contrasting theories of giftedness. Another reason is simply that tests based on alternative assessments of giftedness are not plentiful.

With all this said, it is important to emphasize a few things. Theories of giftedness that do not have available measuring instruments are nonetheless quite useful. If anything, contemporary research suggests the need for factors other than a high IQ for adulthood giftedness. Researchers of giftedness and even contemporary researchers of intelligence understand this. There is an increasing need, however, for educators to fully understand it. Often educators rely strongly on an IQ score for identification into gifted programs because they do not have a full understanding of what information really should and should not be gleaned from an IQ score. It is also important for educators to not lose sight of the ultimate goal of education. Making the honor roll may be the ultimate goal in school, but it certainly shouldn't be the ultimate goal in life. The purpose of education is to prepare students for life after school. Even though the IQ score is an excellent predictor of schoolhouse giftedness, other factors are clearly going to be necessary to achieve eminence in the real world. Educators who lose sight of this important fact are doing an injustice to students who show childhood giftedness as well as those who do not show childhood giftedness.'

Linking Theory to Practice

As mentioned earlier, not all contemporary researchers of giftedness have attempted to test their theories empirically, let alone to develop educational interventions based on their theories. If educators are ever going to include measures of giftedness other than IQ and school achievement, they will need more than just a theory to work with. The research programs of Sternberg, Stanley, and Renzulli are some of the most active approaches (see VanTassel-Baska, 2000, for a more complete listing) to putting the theories into practice and therefore deserve at least to be briefly mentioned.

Successful Intelligence Model. In one study, high school students were identified by their schools as gifted and were invited to participate in a summer program at Yale University (Sternberg, Grigorenko, Ferrari, & Clinkenbeard, 1999). Students completed a pretest that measured analytical, creative, and practical abilities (Sternberg, 1993), based on the theory of successful intelligence. Based on their pretest performance, the students were then classified into five groups. The first three groups comprised those students who were high in one of the three aspects of intelligence (analytical, creative, and practical, respectively). The fourth group comprised those who were high in all three aspects (they scored above the group average for all three abilities), and the fifth group consisted of those who scored at or be-

low the average in all three aspects. The summer program lasted 4 weeks and consisted of a common lecture during the day, with an afternoon discussion section that emphasized analytical, creative, or practical thinking. All students attended the same lecture during the day but were randomly assigned to the discussion section. Using such a design, some students happened to be matched to their strength, whereas others were not. All students were assessed for analytical, creative, or practical achievement by way of two assignments, a final project, and a midterm and final.

Several relevant results came out of this study. First, all three ability tests significantly predicted course performance. Also, students who were placed into an instructional condition that matched their pattern of successful intelligence abilities performed better than those who were poorly matched. Another finding was that by emphasizing all three skills, all three aspects of intelligence were improved. For instance, those in the high-analytical condition improved their creative and practical abilities, and those in the high-creative and high-practical skill conditions improved their analytical abilities.

Also important for gifted education was the initial observation that students in the high creative and high practical groups were more diverse in terms of racial, ethnic, socioeconomic, and educational background than were students in the high analytical group, suggesting that the measurement of creative and practical abilities in gifted identification methods holds the potential to create a more balanced group of students.

A recent study of more than 1,000 students at 15 different institutions also found that inclusion of creative and practical ability tests in addition to SAT scores, GPAs (grade point averages), and gender and socioeconomic status information significantly and substantially increased prediction of freshman grades (Sternberg & the Rainbow Project Team, in press).

Three-Ring Definition. Renzulli's three-ring conception of giftedness has served as the basis for a series of practical models (see Renzulli & Reis, 1994, for a full description of the models as well as their research findings). First, he put forward the enrichment triad programming model (Renzulli, 1977) and the revolving door identification model (Renzulli, Reis, & Smith, 1981).

The enrichment triad offers three types of enrichment experiences for students. Type I enrichment involves general exploratory experiences for students such as field trips and guest speakers. Type II enrichment includes instructional methods and materials designed to promote the development of thinking, feeling, research, communication, and methodological processes. Type III enrichment is the most advanced level and allows the students to participate in investigative activities and artistic production. Type III was designed to allow gifted students to work at as advanced a professional level as possible.

Using a population of 1,162 students in Grades 1–6 in 11 school districts, Reis and Renzulli (1982) examined several variables related to an identification process based on the enrichment triad programming model and the revolving door identification model. Above-average ability students at each grade level were divided into two groups: Group A consisted of students scoring in the top 5% of standardized tests of intelligence and achievement; Group B consisted of students who scored from 10 to 15 points below the top 5% on a standardized intelligence test or were rated highly by teachers using the Scales for Rating the Behavioral Characteristics of Superior Students (Renzulli, Smith, White, Callahan, & Hartman, 1976; Renzulli et al., 2002). Both groups participated in all program activities.

The Student Product Assessment Form (SPAF) was used to compare the quality of products from each group. The instrument provided ratings for eight characteristics of product quality and seven factors relating to overall quality.

There was no significant difference between the two groups with respect to the quality of students' products. The results from this study supported the effectiveness of a model that focuses on creative productivity, in addition to lending support to the three-ring conception of giftedness as comprising students who represent larger proportions than the traditional top-5% approach.

In addition, questionnaires and interview were administered to assess feelings about the program. Many classroom teachers reported that high involvement in the program influenced their teaching practices in a positive way. Also, the opinions of the parents of children who were placed into gifted programs based on traditional criteria did not differ from the opinions of parents of children who were selected under the expanded three-ring criteria. Finally, special education teachers indicted their preference for the expanded talent pool approach compared to the strict reliance on IQ scores.

In another study, Delisle and Renzulli (1982) found that nonintellective factors were just as important for creative production as were intellectual factors. This was also supported by the work of Gubbins (1982), who showed through stepwise multiple regression that above-average ability is a necessary but not sufficient condition for high-level creative productivity. Also of importance were factors such as task commitment, time commitment, as well as student interest, which are factors that are directly related to Renzulli's model.

Most recently, Renzulli combined the enrichment triad model and the revolving door identification model with the schoolwide enrichment triad model (SEM; Renzulli & Reis, 1985, 1997). A central aim of the SEM model is to apply the general enrichment techniques that were used in the triad/revolving door identification model to help all students, not just those identified as gifted.

The SEM model offers educators three service delivery components (Renzulli & Reis, 1994). The first component is the total talent portfolio

(TTP), which is used as a way of gathering and recording students' abilities, interests, and learning style preferences. The second component involves a series of curriculum-modification techniques that are designed to assess each student's mastery of material, adjust the pace and level of required material to accommodate variations in learning, and provide enrichment and acceleration alternatives for students who master material at a faster rate. The third component involves a set of strategies designed to promote active engagement in learning.

The SEM model has been implemented in several hundred school districts across the United States (Burns, 1998) and has demonstrated effectiveness under widely differing socioeconomic levels and program organization patterns (Olenchak, 1988; Olenchak & Renzulli, 1989). In addition, more than 600 educators are trained on the model each summer at the University of Connecticut.'

MVT:D⁴ Model. As already discussed, Julian Stanley believes in focusing attention on identifying students who are displaying high achievement in a particular domain, with the aim of helping those individuals develop to their full potential. He emphasizes the use of content-specific criterion-referenced measures for identification instead of standardized measures of intelligence that measure general reasoning abilities. Stanley's view is that a program for the gifted should achieve an optimal match between a student's cognitive ability and other characteristics and the educational program.

The SMPY program has developed the diagnostic testing-prescriptive instruction model, which gives high-achieving students pretests that diagnose specific content that has not yet been mastered and structures a program to teach only that content (Stanley, 2000). SMPY then counsels students to help develop challenging individualized programs. This approach, which is part of CTY's Study of Exceptional Talent Program, helps students with high math or verbal ability before the age of 13 years to find opportunities to accelerate or supplement their regular school programs (Brody, 2004; Brody & Blackburn, 1996). Interventions have taken the form of academic summer programs, distance education, and extracurricular opportunities.

A series of longitudinal studies have been implemented to test the effectiveness of Stanley's model. Based on the results of these studies, Swiatek (1993) concluded that acceleration is an educational option that is inexpensive to implement, requires little specialized training for teachers, and can be used in most educational settings to meet the learning needs of many gifted students. In addition, it was concluded that acceleration does little harm to willing students academically or psychosocially, and may help gifted individuals establish a foundation for advanced learning, maintain interest and involvement in academic activities, and earn extra time that can be used for the development of a career.

In addition, a 50-year follow-up study (1972–2022) is in progress at Iowa State University and includes over 6,000 students (Lubinski & Benbow, 1994). It is hopeful that the results of the longitudinal study will not only help to validate Stanley's model but will also increase our understanding of the talent development process.

The Diversification of the United States

The recent Bush Administration report *Minority Students in Special and Gifted Education* (Committee on Minority Representation in Special Education, 2002) reports that African American, Hispanic American, and Native American Indian students' chances of identification for and inclusion in gifted programming are well below the chances for the population as a whole. The reason for this cannot be explained away by education. Miller's (2000) report on minority academic achievement patterns concluded that, although parental education level predicts increases in standardized test scores, large discrepancies still remain between majority and minority student populations, even after controlling for parental educational levels.

With the increasing diversification of cultures in the United States,¹ the problem is only bound to get worse. In addition, these students and their families bring their own conceptions of giftedness that are tied to their own culture. The conception they bring may be quite different from the ones applied by American educators.

This is an increasing problem for gifted researchers in the United States, but one in which there is promise. As the results of Sternberg and Renzulli have demonstrated, a broader conception of giftedness (one that doesn't rely solely on standardized measures of intelligence) allows more minority students to be identified as gifted. This research certainly does suggest that because minority students perform lower on standardized tests of intelligence, any giftedness program that focuses solely on standardized test scores and academic achievement runs the risk of leaving out a large number of potentially gifted minority students. Even though models of giftedness like Sternberg's and Renzulli's help the problem, they do not solve it. Giftedness researchers should continue research that may elucidate why minority students score lower on standardized tests of intelligence. Such an understanding will undoubtedly improve such tests as well as our understanding of how different cultures' conceptions of what it means to be gifted and intelligent may affect how their students perform on American tests of intelligence.

¹ It may be interesting to note that the diversification of the United States in the first quarter of the 20th century was a major impetus for the large-scale application of standardized tests of intelligence in American schools (see section "Origins of Modern American Conceptions of Giftedness" earlier in this chapter). Today, it would seem that the resurgence of diversification in the United States will require a difference methodology, at least insofar as identifying gifted and talented students from various cultural backgrounds is concerned.

THE FUTURE OF GIFTED EDUCATION IN THE UNITED STATES

All four issues, childhood and adulthood giftedness, (the identification of gifted students, the linking of theory to practice, and the diversification of the United States are highly related to each other. The issues will not be resolved by rhetoric but by scientific research. Gifted education researchers attempting to understand how childhood potential develops into adulthood eminence will face continual demands empirically to test which factors are more important than others, develop tests that measure the factors, and create educational interventions to help foster the development of the factors. The state of gifted education will gain much momentum once giftedness researchers produce tests based on their theories that demonstrate validity, reliability, and objectivity, and which are inexpensive and identify a larger cross-section of gifted students.

All of this may seem like a tall order for the next generation of researchers of giftedness, but it is a goal that is well worth the fight. As the United States enters a period of intense technological and scientific sophistication and increased need for the contemplation of moral implications, finding gifted individuals with the drive, creativity, intelligence, and wisdom to handle such sophistication and interact with the global world will be an increasing priority. Fortunately, there is much promise for the ways such gifted individuals will be identified and nurtured.

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