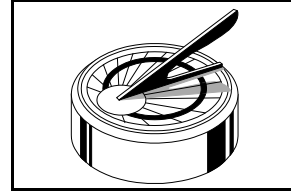


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As we begin our sixteenth year of publishing this quarterly, I wish all of you a Happy New Year. May you have much success in educating gifted children. We have published many outstanding articles during these sixteen years in such areas as identifying the gifted, early education programming, parent advocacy, humanities curriculum (e.g., teaching literature and philosophy), differentiated mathematics and science programs, multiple intelligences, training teachers of the gifted, and improving the social-emotional development of gifted children. We are especially gratified to have published the ideas of new authors from universities and school districts. *GEPQ* will continue to provide a forum for the ideas of new contributors to this field and of experienced professionals. As our advertisement for *GEPQ* says, we only offer a "Lifetime" subscription, and that is how long we intend to continue this publication!

Here are two recurring themes and issues educators of the gifted must be constantly aware of: (1) Giftedness should be considered as the potential for great achievements rather than a particular set of characteristics that are either present or absent. By viewing giftedness in this manner, educators and parents can provide opportunities for children who do not initially demonstrate high test scores; and (2) High Sensibility (a heightened awareness of the child's social and physical environment) is an important characteristic of giftedness that should be considered when screening children for gifted programs. This characteristic can be easily overlooked because it is difficult to measure with standardized tests.

Professor Jack Naglieri, Director of the Center for Cognitive Development at George Mason University, has written a very informative, research-based article for this issue that discusses the use of his nonverbal ability test with gifted minority children. He is the author of more than 150 scholarly papers, chapters, books, and tests. He has focused his efforts since the late 1970s on reconceptualizing intelligence and issues such as fair assessment, identification of gifted, LD and ADHD children, PASS theory of intelligence, and cognitive instructional interventions. It should be noted that his nonverbal ability test in conjunction with other instruments and procedures has recently been successfully used in the Fairfax County Public Schools (Virginia) GT screening process for 9,500 second graders. This issue of *GEPQ* also includes an article by Jane Mitchell, teacher of the gifted, on using information about visually impaired individuals to stimulate gifted children's visual learning and Sensibility. Mary Bruck, former manager of gifted programs in Florida, discusses identifying gifted preschoolers, and Michael Walters has an essay on George Orwell whose writings merit close study by gifted students.

**Maurice D. Fisher, Ph.D., Publisher**

## **Fair Assessment of Gifted Minority Children Using the NNAT**

**By Jack A. Naglieri, Ph.D., Director**

**Center for Cognitive Development George Mason University**

The under-representation of minority children in classes for the gifted has been and continues to be one of the most serious problems facing educators of gifted students (Ford-Harris, 1998). It was well documented in the 1993 U.S. Department of Education report that Black, Hispanic, and Native American students were under-represented by 50% to 70% in gifted education programs. Ford-Harris (1998) has further argued that, despite recent efforts to redress this problem, the under-representation of minority students in gifted programs has not only been persistent but for some groups, it has increased. To resolve the problem of under-representation of minority children by examining ability tests, some researchers (de Bernard, 1985; Naglieri, 1999; Sternberg, 1985) have focused on the tests used in the identification process.

Researchers have attributed the problem of under-representation of minority students in gifted programs to standardized tests, asserting that these tests fail to assess the strengths and abilities of culturally, ethnically, and linguistically diverse populations (Frazier, Martin, Garcia, Finley, Frank, Krisel & King, 1995). Support for this assertion comes from reports showing that Black, Hispanic, and Native American students consistently score lower than White students on traditional standardized tests (Brody, 1992; Naglieri, 1999; Sattler, 1988). Others suggest that policies and procedures have a disparate impact on the participation of diverse students in gifted programs, especially the common procedure used by schools – teacher referral. Ford-Harris (1998) suggested that teachers often under-refer diverse students for gifted education screening and placement. Additionally, some school administrators require that students be assessed in English, which has a profound impact on linguistically diverse or limited English proficient students (de Bernard, 1985).

Given the widespread concerns about testing and assessing diverse students with traditional measures, it is important that we closely examine the evidence for tests that are considered more culturally fair. Many of the more commonly used tests of this type are described as “nonverbal.” Nonverbal tests like the Raven’s Progressive Matrices (Raven, 1947) and the Naglieri Nonverbal Ability Test (NNAT; Naglieri, 1997) have been used to evaluate diverse populations of children for some time. Raven’s Progressive Matrices and the NNAT are comprised of nonverbal, geometric designs arranged in a 2 by 2 or 3 by 3 matrix. These items can be considered to have content that is culturally reduced because they do not contain items that require the child to define words or solve oral (English) arithmetic problems. The tests seem especially useful for identification of gifted minority children because the nonverbal content is more appropriate for a wide variety of children (Jensen, 1980; Naglieri

& Prewett, 1990; Sattler, 1988).

Researchers have found that the nonverbal measures are less influenced by limited English language skills and, therefore, more appropriate for bilingual children (Hayes, 1999; Naglieri & Yazzie, 1983). Verbal test scores can be adversely influenced when children have poor language skills and live in poverty (Kaufman, 1994; Naglieri, 1999). The use of nonverbal tests helps reduce problems associated with measuring ability through language tests like vocabulary. For these reasons, nonverbal tests of ability are considered appropriate for a wide variety of persons, especially those with limited English language skills and academic failure (Bracken & McCallum, 1998; Zurcher, 1998).

Nonverbal tests have many advantages, but there are several questions that need to be addressed, and will be, in this paper. For example,

- What exactly does a nonverbal test measure?
- Does a nonverbal test measure only half of ability because it does not include verbal tests?
- Is there research that shows small differences between race/Ethnic groups on nonverbal tests?
- Is there evidence that a nonverbal test can help reduce the problem of under-representation of minority children in gifted classes?
- What implications does the use of a nonverbal test have for minority children identified as gifted?

These and other related questions will be addressed in this paper. First, the concept of general ability and verbal and nonverbal tests will be examined. Next, a recently published nonverbal test will be described, along with information about its standardization sample and test validity. A close examination of the research on race and Ethnic differences will be provided as well as work on the identification of gifted minority children. Implications of these findings will also be provided.

### **Nonverbal Ability or General Ability?**

Most educators accept the view that intelligence comes in two kinds – verbal and nonverbal. It is typical to hear teachers and administrators talk about verbal and nonverbal “intelligence,” accepting these terms as representing two abilities rather than as ways to measure general intelligence. This confusion is logical because our view of ability as framed by David Wechsler in 1939 when he published what would become the widely used Wechsler Intelligence Scale. What most professionals do not know is that Wechsler’s scales of intelligence were modeled

from the Army Alpha and Beta tests described by Yoakum and Yerkes (1920) in the book *Army Mental Tests*. Wechsler followed the verbal (Alpha) and nonverbal (Beta) format and, influentially, provided separate IQs for the verbal and nonverbal (Performance) intelligence scales. Thus, verbal and nonverbal “intelligence” constructs logically followed.

The organization of two types of IQ scores does not designate different types of ability, but rather, two different ways of measuring the concept of general ability. In fact, the general nature of the concept of intelligence is apparent in Wechsler’s definition of ability as “the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment” (1939). Note that there is no discussion of verbal and nonverbal types of intelligence in this definition. Moreover, Wechsler wrote that nonverbal tests helped to “minimize the over-diagnosing of feeble-mindedness that was, he believed, caused by intelligence tests that were too verbal in content ... and he viewed verbal and performance tests as equally valid measures of intelligence and criticized the labeling of performance [nonverbal] tests as measures of special abilities” (p. 396, Boake, 2002). It is reasonable, therefore, to conceptualize the verbal and nonverbal labels as descriptions of the content of the tests, not the type of thinking.

Assessment of intelligence for persons with limited English language skills has been an important issue since the familiar verbal-nonverbal organization of tests was used in the early 1900s. The value a nonverbal test has for evaluation of diverse populations was noted more than 80 years ago by the statement, “Men who fail in alpha [the verbal tests] are sent to beta [the nonverbal tests] in order that injustice by reason of relative unfamiliarity with English may be avoided” (Yoakum & Yerkes, 1920, p. 19). The Beta tests and other nonverbal tests like them have, therefore, served an important role in effective assessment of diverse populations because they have culturally reduced content (Jensen, 1980; Naglieri & Prewett, 1990; Sattler, 1988). It is logical and empirically supported that bilingual persons will likely do poorly on English measures of general intelligence that contain verbal tests because of limited English language skills and that nonverbal measures of general ability are, therefore, more useful across cultures (Bracken & McCallum, 1998; Hayes, 1999; Kaufman, 1994; Naglieri & Yazzie, 1983; Zurcher, 1998).

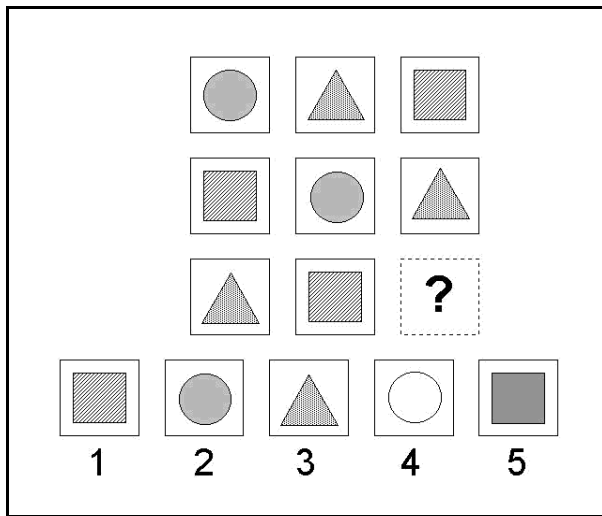
My position is that general intelligence tests with verbal content and nonverbal content measure essentially the same construct as general ability tests that are all nonverbal or all verbal. That is, general intelligence can be assessed using tests having a variety of different types of items (verbal, quantitative, nonverbal, etc.). This view that general intelligence tests that differ in content (e.g., a nonverbal test and a test with a variety of types of items) can actually both be considered measures of the same construct (general ability) can be examined empirically. For example, if it were true that a nonverbal test of general intelligence was less complete than a test of general intelligence composed of both verbal and nonverbal items, then the solely nonverbal instrument

should have less validity. Naglieri (1999) addressed this question when he examined the correlations between various tests of intelligence and achievement. He found that the median correlation between the Wechsler Intelligence Scale for Children – Third Edition (Wechsler, 1991) and the Wechsler Individual Achievement Test (Wechsler, 1992) was .59 for the sample of 1,284 children who were administered both measures. This correlation can be compared to data reported in the manual of the Naglieri Nonverbal Ability Test (NNAT; Naglieri, 1997). The NNAT is comprised of nonverbal progressive matrix items (this is more fully described later in this document). In that manual, he reported a median correlation of .61 between the NNAT and Stanford Achievement Test – Ninth Edition (SAT-9) for 21,476 children in grades K-12. Similarly, Naglieri (1985) reported the correlation between the Matrix Analogies Test – Expanded Form (MAT-EF, an earlier version of the NNAT) and reading (.55) and math (.58) achievement standard scores for a sample of 2,050 children in grades 4 through 12. These data clearly show that nonverbal tests of general ability, comprised of nonverbal test items, are as effective for predicting academic achievement as the individually administered verbal and performance WISC-III. The reason why these two tests correlate similarly with achievement is that, despite their different contents, they are both measures of *general ability*.

The strength of nonverbal tests like the NNAT is that the method of measuring general ability nonverbally excludes questions that involve verbal expression and/or reception, general information, math or reading skills, and have minimal motor requirements. In contrast, the inclusion of verbal tests with strong achievement components poses a problem for assessment of diverse populations. Thus, the structure of a nonverbal test like the NNAT allows for a fair evaluation of ability for children from different cultural and linguistic groups – a point that will be emphasized later in this article.

### The NNAT – Description of the Test

The Naglieri Nonverbal Ability Test (NNAT; Naglieri, 1997) is a group administered nonverbal test of general ability that uses 38 items composed of diagrams illustrated in Figure 1 (page 4). In this example, a student must see the patterns formed by the shapes that are organized into a pattern, then choose an answer that completes the pattern. Actual NNAT items use the colors blue, white, and yellow because these colors are least influenced by color-impaired vision. In this example, the child has to understand that the three shapes form a pattern throughout the 3x3 matrix. The circle forms a diagonal line from the bottom right to the top left. The triangles and the squares form their own alternating pattern which when understood, allows the child to choose the correct option (#2). In order to find the correct answer, the child must interrelate all the parts and see the patterns they form.



The NNAT consists of seven separate booklets organized into levels that contain 38 items. The seven levels and corresponding grades for which they are intended are as follows: Level A. Kindergarten; Level B. Grade 1; Level C. Grade 2; Level D. Grades 3-4; Level E. Grades 5-6; Level F. Grades 7-9; Level G. Grades 10-12. Each level contains items shared from both the adjacent higher and lower levels, as well as exclusive items. The shared items were used to develop a continuous scaled score across the entire standardization sample. These items yield a total raw score that is converted to a Nonverbal Ability Index standard score set at a mean of 100 with a standard deviation of 15 through an intermediate Rasch value called a scaled score. Thus, each child's raw score is converted to a scaled score (Rasch value) based upon the NNAT Level administered, then the scaled score is converted to a standard score based upon the age of the child. For more information see Naglieri (1997).

### Normative Sample

The NNAT was standardized on a nationally representative sample of 89,600 children in grades K through 12 (ages 5 through 18 years). The sample included 22,600 children tested in the fall of 1995 and 67,000 children tested in the spring of 1996. The final complete sample used to create the NNAT norms tables closely matches the U.S. population on the basis of geographic region, socioeconomic status, urbanicity, Ethnicity, and school setting (private and parochial). The sample included children in special educational settings such as those with emotional disturbance, learning disabilities, hearing and visually impairment, and those who were mentally handicapped. Children with limited English proficiency were included in the standardization sample. This standardization procedure also involved concurrent administration of the Stanford Achievement Test – Ninth Edition (SAT-9; 1995). More details may be obtained from the NNAT Technical Manual (Naglieri, 1997).

### NNAT Validity Research – Race and Ethnic Comparisons

A detailed study of mean score differences and correlations to achievement for matched samples of White ( $n = 2,306$ ) and African-American ( $n = 2,306$ ), White ( $n = 1,176$ ) and Hispanic ( $n = 1,176$ ), and White ( $n = 466$ ) and Asian ( $n = 466$ ) children on the NNAT was provided by Naglieri and Ronning (2000). The three pairs of groups were carefully selected from a larger sample of children included in the NNAT standardization sample and matched on the demographic characteristics of the U.S. population, including geographic region, socioeconomic status, Ethnicity, and type of school setting (public or private). Only small differences were found between the NNAT scores for the White and African-American samples (Cohen's  $d$  ratio = .25 or about 4 standard score points). Minimal differences between the White and Hispanic ( $d$ -ratio = .17 or about 3 standard score points), as well as White and Asian ( $d$ -ratio = .02, less than one standard score point) groups were reported as well. Additionally the correlations between NNAT and academic achievement were similar for the White and minority groups. The small mean score differences and the strong correlations strongly suggest that the NNAT has utility for fair assessment of White and minority children. The study of the performance of minority children with limited English language skills was examined in more recent research.

### Hispanic ESL Children

The differences between Hispanic children with ( $n = 148$ ) and without ( $n = 148$ ) limited English proficiency who were administered the Naglieri Nonverbal Ability Test (NNAT; Naglieri, 1997a) and the Stanford Achievement Test – Ninth Edition (SAT-9; 1995) were studied by Naglieri, Booth and Winsler (2002). Two groups of Hispanic children were selected from 22,620 children included in the NNAT standardization sample and matched on geographic region, gender, socioeconomic status, urbanicity, and ethnicity. The results showed that there was only a small difference ( $d$  ratio = 0.1) between the NNAT standard scores for the Hispanic children with limited English proficiency (mean = 98.0) and those without limited English proficiency (mean = 96.7). In addition, the NNAT correlated similarly with achievement for the Hispanic children with and without limited English proficiency. The results suggested that the NNAT scores have use for assessment of Hispanic children with and without limited English proficiency and that these children earned scores that were close to average, a result also found for Native American children.

### Native American Children

Kaufman and Naglieri (2002) examined the performance of Native American children on the NNAT. In their study, the standardization sample of the NNAT ( $N = 89,600$ ) was used to

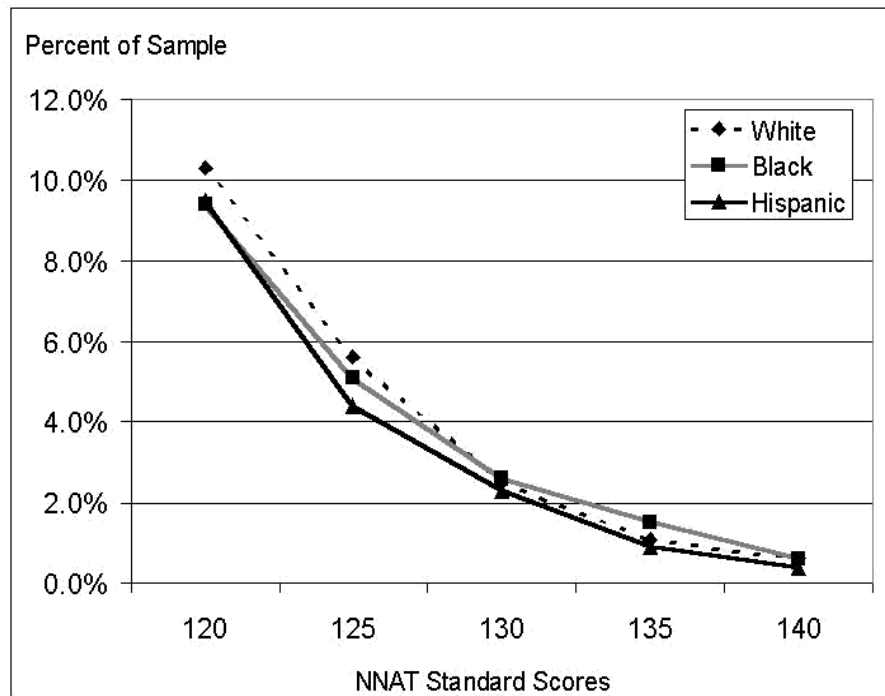
explore how scores for Native Americans ( $n = 793$ ) compared to mean scores from other groups when controlling for grade, SES, urbanity, and region. Native Americans (mean = 96.3) were found to score similarly to Hispanic (mean = 95.5) and African Americans (mean = 94.2). The differences between these groups was small ( $d$ -ratio of .1), and they earned a small difference from Whites (mean = 100.7) ( $d$  ratio = .3). Native American scores on the NNAT correlated .55 with SAT-9 reading and .51 with SAT-9 math, which are consistent with the scores obtained for the entire sample of .55 and .63, respectively. Thus, these data suggest that Native American children earned similar NNAT scores to White children, and those scores correlated to achievement about the same for both groups.

**Identification of Gifted Minority Children**

Perhaps one of the most important studies of the NNAT and Race/Ethnic differences which suggests that the NNAT is useful as a fair measure of general ability for gifted minority children was reported by Naglieri and Ford (2001). They studied the practical question: If the NNAT yields small mean score differences between minority and majority groups, would it identify similar percentages of White, Black and Hispanic children as gifted? Of course, the NNAT would be one part of the larger assessment process used to determine placement in classes for the gifted, albeit an important part. If children would be similarly identified as gifted using the NNAT scores, then the numbers of minority children who may have the opportunity to be selected for gifted might be increased. To study this question,

Naglieri and Ford (2002) used a sample of 20,270 children from the NNAT standardization sample tested during the fall of 1995. These students were representative of the national school population according to socioeconomic status, urbanicity and ethnicity. The characteristics of the separate Black, Hispanic, and White groups are similar in composition. The question addressed by Naglieri and Ford (2002) was: Are the percentages of children who earned NNAT standard scores from 120 to 140 comparable by racial and ethnic groups? To answer this question, standard score frequency distributions were compared to obtain the percentage of each group that would meet the intellectual ability criteria based upon a standard score of 120 as well as 125, 130, 135, and 140 or above (corresponding to the 91st, 95th, 98th, 99th, and 99.6th percentile ranks).

Naglieri and Ford (2002) found that 5.6% of the White ( $n = 14,141$ ), 5.1% of the Black ( $n = 2,863$ ), and 4.4% of the Hispanic ( $n = 1,991$ ) children earned an NNAT standard score of 125 (95th %tile rank) or higher, and 2.5% of White, 2.6 % of Black, and 2.3% of Hispanic children earned NNAT standard scores of 130 or higher (98th percentile). The identification rates at each five-point interval from 120 to 140 are shown in Figure 2 below. What is so remarkable about these data is that the percentages of children that would be identified if the NNAT was used are very similar across the race and Ethnic groups. These results suggest that the NNAT was effective at identifying diverse students who could be eligible for gifted education services. They also suggest that the NNAT may help address the persistent problem of under-representation of diverse students in gifted education.



### Implications of NNAT Research

The results of Naglieri and Ford's (2002) investigation in combination with NNAT research that has shown that samples of White and minority children perform similarly on this nonverbal measure of general ability (Naglieri & Ronning, 2000; Naglieri, Booth, & Winsler, 2002; Kaufman & Naglieri, 2002) provide strong support for the utility of the test for minority children. What is most important about the Naglieri and Ford study is that they went beyond the examination of mean score differences and correlations to achievement, and asked the *practical* question regarding the differential rates of identification for diverse groups. The similar percentages of White, Black, and Hispanic children who earned high NNAT standard scores illustrated the potential utility of this instrument for the identification of gifted minority children.

The summary of research provided in this paper suggests that although under-representation of minority children in classes for the gifted has been a problem for many educators and psychologists, there is evidence that these groups may be assessed in a manner that may not lead to under-representation. The results illustrate how a nonverbal test (NNAT) can be used to fairly evaluate minority children's general ability. The main difference between the NNAT and other group ability tests is that the latter typically include verbal, quantitative, as well as nonverbal tests. Some researchers have argued that a general ability test with verbal and quantitative items is limited in utility because it demands English language skills and knowledge directly taught in school (Naglieri, 1999; Naglieri & Prewett, 1990). These studies summarized here suggest that the NNAT can provide a more appropriate measure of general ability for minority children than a measure of general ability that contains both verbal and nonverbal content.

The most important implication of this line of research on the NNAT and minority children is that this approach, when used as part of a larger identification process, could help diverse students gain access to gifted education services. The next important issue is to examine what classroom modifications and specific educational interventions might be necessary when children are assessed and placed in gifted programs using nonverbal measures. For example, it is possible that very smart children with limited English language or academic skills may be identified as intellectually gifted. Researchers and administrators will have to determine how these gifted students who do not have comparable achievement levels as students identified with traditional measures should be educated. The results of the research summarized here suggest that these and other issues that effectively address the problem of under-representation of minority children in classes for the gifted need the continued attention of researchers and practitioners alike.

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**Celebrating the Senses: An Interdisciplinary Unit for Upper Elementary Gifted Students**

**By Jane P. Mitchell      The Rock, Georgia**

When I tell my fifth grade gifted students at our rural Georgia elementary school that we will be revisiting the five senses in a unit called, "Celebrating the Senses," their reaction is one of surprise. After all, they explain, they studied the five senses back in *primary* school. I then explain that to revisit is not the same as to relearn; this interdisciplinary lesson is one that uses the five senses as a springboard to science activities, writing, Internet research, role-playing, and discussion of relevant themes of contemporary life. Throughout, I encourage them not just to identify the senses but to also determine how they are interrelated. As we progress, they also begin to see how one theme connects to literature, language, creative writing, science, and history.

The inspiration for this came as a result of a service-learning project my students took part in with our local Lions Club, which sponsored a chicken barbeque to raise money for a Lions Club charity of their choice. They did the advertising, sold tickets, and worked the day of the barbeque filling plates with barbequed chicken, slaw, and chips. The Lions Club members purchased and cooked the food. Together they raised \$1,200. When the Lions Club president came to ask what charity students wished to donate the proceeds, they voted unanimously for Leader Dogs for the Blind, which provides seeing eye dogs to the blind.

The service-learning project was significant in many ways. Not

only did students recognize the importance of community service, they met many adults who modeled good citizenship. I also observed that they were keenly interested in understanding what it would be like to lose one or more of the senses. They wanted to know about scientific advances in correcting and preventing hearing and vision loss. And, they expressed a growing interest in the animals that help humans through service or research. I realized that their previous study of the five senses was just a beginning and that the topic could be expanded to meet the educational needs of the gifted in various areas of study. "The purpose of education is to help us understand our various worlds – the physical, the biological, the social, and the person. We get this by delving deeply into topics, not by memorizing 50 or 500 terms and concepts each year" (Gardner, 1999, p. 48).

The heart of this lesson is the young adult novel, Cheshire Moon, by Nancy Butts. Cheshire Moon tells the story of a deaf girl, Miranda, who struggles with her cousin's death, her anger at a hearing world that is unwilling to learn sign language, and her growing awareness of a *sixth sense*. Discussion of the novel raises many issues that are relevant to young people. First, they consider what life would be like for them if they did not have one of their senses. The descriptive language of the novel allows them to feel the frustration and isolation that Miranda demonstrates when she is expected to learn to speak with her voice. Her closest friend and cousin, Timothy, has died. Not

only is Miranda grieving for him, she is grieving for herself, for Timothy was the only person her age who had taken the time to learn sign language. This leads to a discussion of friendship, and students discuss ways in which they could be a friend to Miranda or someone like her. Finally, there is discussion of ESP, since in the novel, Miranda and the character Boone are sharing the same dreams. They debate the possibility of a sixth sense and compare the handling of the topic in this novel with other novels they have read. As in every reading that they do, I encourage discussions, for "When children talk to each other, they create new ideas. They argue and think about other ways of solving problems" (Gambro, 1997, p. 19).

"Celebrating the Senses" has a strong language connection. We are especially fortunate because the author of Cheshire Moon, Nancy Butts, is a resident of our county and visits our class once they have completed the novel. Students have the opportunity to discuss with her the use of figurative language, questions about the characters, and steps to the writing and publishing process.

The language connection also includes a strong emphasis on non-verbal communication. As students read and discuss Cheshire Moon, they take notice of Miranda's use of sign language to communicate. Although I do not attempt to teach proficiency in American Sign Language and Braille, I do try to make them aware of their importance. And as they analyze the growing friendship between the characters of Miranda and Boone, they also observe that gestures, acts of courtesy, and facial expressions are also means of communication.

At this point in our study, I try to have visitors come to my class to share their expertise. One of the special bonuses of teaching this unit is that I have not had to look far for experts. Special education teachers, health care professions, and those in science fields are usually happy to share their knowledge. One of our guests is a parent who formerly taught the visually impaired. During her visit, she shares copies of the Braille alphabet, and lets students examine many of the reading materials and teaching tools that she used. Of most interest to them, is their role-playing in which they work in pairs. In the role-playing, one student is sighted and one is blind. The parent shows how to properly walk together, to cross streets, and to be courteous.

Another parent was a teacher of the deaf. During her visit, she teaches the American Sign Language alphabet and several phrases through games and songs. Students also have the opportunity to speak to her about her work, and relate what they have learned about deafness and sign language through the character of Miranda.

Another guest is a woman who, through Earthwatch, volunteered at Central Washington University to work with the chimpanzee Washoe and her adopted son, Loulis. She explains that Washoe was the first nonhuman animal to acquire a human language and that Loulis was the first nonhuman animal to acquire a human language from another chimp. Students delight

in the anecdotes about Washoe, Loulis, and other chimps at Central Washington University; they enjoy the photographs our guest has brought of these incredible animals; and they marvel as she explains the care and responsibility that researcher Roger Fouts has taken to ensure the well being of these animals.

Her visit sparks interest and excitement in scientific research. Why were researchers interested in teaching sign language to chimpanzees? What can we learn through animal research? How are other research animals treated? I share with them Fouts's own words about the Chimpanzee and Human Communication Institute in which he states, "We do not enter the chimps' home or play areas, and any interaction with us is up to them. Their interests and well-being are our first priority" (Fouts, 2000, p. 72). Students ponder aloud the enormous responsibility that scientists have to advance health care and research while maintaining ethical standards.

Throughout this unit, I include science investigations to stress the interrelatedness of the senses. For instance, in one activity students take turns closing their eyes and finding a dime in a bagful of pennies (Jeffries, 1993). In another activity, they conduct a taste test. Can they distinguish between an apple, onion, and a potato by smell alone? (Tolman and Morton, 1986) Or, I ask them to name one activity they do during the day. What senses are involved? The activities are fun and simple, and they actively involve everyone. The key is to stress the interrelatedness of the senses.

Now it is their turn to lead the discussions of science, and "Celebrating the Senses" opens the door to many areas of timely research in health, medicine, animal behavior, ESP, and human psychology. Internet investigations are valuable, and they now take the lead in discovering the aspect of science that has piqued their interest. I have learned that, "When students initiate their own learning, they participate in productive questioning, probing for information they can use rather than waiting for the next question on a test or from a teacher" (Hancock, 1997, p. 60).

Next, I introduce a history connection. This provides the perfect opportunity to learn about the incredible accomplishments of Helen Keller, who lost both her vision and hearing during a childhood illness. Her story is, of course, one that is forever linked with that of her teacher's, Anne Sullivan. Two other people important to the content are Alexander Graham Bell, inventor of the telephone, but who once stated that he would rather be remembered as a teacher of the deaf, and Louis Braille, inventor of the Braille alphabet.

Once again, I turn to literature to build understanding of these noteworthy individuals. Students enjoy A Picture Book of Louis Braille by David A. Adler and Helen Keller by George Sullivan. This biography of Keller has many photographs that they enjoy studying. I also read excerpts of Helen Keller's autobiography, The Story of My Life. They are unconditionally moved by Keller's own description of her blindness and of her acquisition of language.



As part of the unit, they have already used research tools such as the Internet and encyclopedias to find scientific information. Now, they work in cooperative learning groups to research Helen Keller, Anne Sullivan, Alexander Graham Bell, or Louis Braille. They decide which of the four they would like to learn more about. Then I set the room up in rotating research stations: encyclopedias, Encarta, the Internet, and biographies. Students help one another in their group to acquire information and to record accurately their sources for a bibliography. Because of the small groups and limited number of research topics, I can easily assist them in finding both primary and secondary sources. Once the groups have done their research, they write individual research reports. This method of doing historical research does two things: It provides an enjoyable format for collecting and recording data, which are often two difficult aspects of the research writing process, and it allows the teacher to guide them in the research process in a manageable setting. Once they have shared their reports, they discuss the assignment. Their shared experience in researching a topic as part of a group allows them to express themselves freely about the frustrations and successes they encountered in the research process.

Of course, the historical connection would not be complete without watching the video of the 1962 movie, The Miracle Worker (Coe, 1962). Since creative writing is an emphasis in my gifted classes, the movie serves as a powerful lesson on the way scripts are written to stir the emotions and to add interest without deviating from the truth. Through discussion, pupils compare the biography they have read about Helen Keller to the movie. They observe that the movie concentrated on a small but significant part of Helen Keller's life. The biography, they assert, gives added details including the meeting between Helen Keller and Patty Duke, the young actress who portrayed Helen (Sullivan, 2000).

I then ask what was the most significant scene in the movie. They unanimously agree that it is when Helen Keller spells w-a-t-e-r and the world of language is opened to her. I then read Keller's own words about this event: "Suddenly I felt a misty consciousness as of something forgotten – a thrill of returning thought; and somehow the mystery of language was revealed to me. I knew then that " w-a-t-e-r" meant the wonderful cool something that was flowing over my hand. That living word awakened my soul, gave it light, hope, joy, set it free!" (Keller, 1988).

Students conclude that "water" is a symbolic word that shows how Keller's world of learning begins to flow, like water. They discuss the properties of water – without boundaries, free flowing, necessary to life – and they marvel that real life is often poetic and that it can inspire great writing. Then, they head to the word processors or take out their notebooks and write, inspired by the celebration of language!

I am presently teaching this unit for the third year, and like many others, it is one that has changed and shifted. Much depends on the students themselves and where their interests lie. This year,

they will end with a product created by themselves. Of course, I guide them with suggestions. I tell them about the service-learning project that inspired the lesson. Some of them have decided that they will also organize this type of project. Others will use their talents in writing. Some will create a Power Point presentation on a science field they have researched. Others plan to use art to show the power of w-a-t-e-r. One tells me that she plans to present a children's book to the class in American Sign Language, and another makes arrangements to interview one of our special education teachers. "Celebrating the Senses" has wide horizons, but "Once some broad ideas related to the theme are established, students can begin to explore the many connections between subject areas" (Bulls and Riley, 1997, p. 22). As they end with explorations of their own choosing, they see further connections. "Celebrating the Senses" is celebrating learning!

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**Helpful Websites for "Celebrating the Senses"**

<http://faculty.washington.edu/chudler/experi.html>  
Science experiments on each of the senses.

<http://family.go.com>  
Exploring the Senses: Five Sense Activities for Family Fun.  
Experiments, questions, answers.

<http://www.cwu.edu/~cwuchci/chciframset.html>  
Information about Washoe, the first nonhuman animal to acquire a human language.

<http://www10.lionsclubs.org>  
Lions Club International Official Website

<http://www.lionnet.com>  
A network of national and state level service sites.

<http://letstalkscience.uwo.ca/activities/NSTW97/index.html>  
A copy of the Braille alphabet.

<http://www.blind.net/bg000001.htm>  
Information about courtesy to the blind.



**Recognizing Advanced Intellectual Abilities in Pre-School Age Children**

**By Mary F. Bruck, Ed.D. Murrysville, Pennsylvania**

My years of work with intellectually advanced children have always been mirrored by requests from parents and care-givers to discuss indicators that tell if their children were performing or acting in the above normal range of intelligence when compared to other children of the same age. The following indicators may serve parents of preschool age children to help them determine if these youngsters warrant further study to accurately measure their intellectual potential. These children may experience some, all, or only a few of the following indicators or so-called characteristics of intellectually gifted or advanced abilities children.

Quite often these children will begin reading before the age of five. This indicator may be more frequently found in girls than in boys. A long attention span is present with these children wanting to work for long periods of time on things that interest them. Silverman (1988) noted this length in attention span in her work with young gifted children. I remember a five-year-old boy who insisted on putting together an electronic game that was designed for an eleven or twelve-year-old child. Although he could not read the directions, he could follow the schematic patterns on how to fit the parts together. His mother vividly remembers putting him to bed at his usual bed time. When she awoke at two o'clock a.m., she found him out of his bed and busily working on the game. Once again, the boy was "put to bed." In the morning, however, the game was working perfectly.

Intellectually advanced children at the preschool age may also exhibit advanced and sophisticated vocabularies. They might tell you that they are nauseous rather than sick in their tummy. They may describe colors in sophisticated terms such as fuchsia or magenta rather than red, yellow, or blue. These children can have adult-like conversations. Sometimes it is easy to forget that they are as young as they are from the manner in which they respond to adults. This characteristic is readily supported in the

literature as well (Silverman, Chitwood, & Water, 1986). These young gifted children display the understanding of numerical concepts. Addition and the reverse (subtraction) are understood. A child I was working with, at age four, could reason out multiplication by adding the appropriate numbers. He could tell me that six times four was twenty-four by adding six together four times. Reversals are also evident in the fact that these children can remember directions on how to get home from a shopping trip or an outing. They know where they are and they know how to get home or to their point of origin. Intellectually advanced children may also enjoy putting together puzzles, one hundred piece puzzles. It is not unusual for a three or a four-year-old child to accurately put together a fifty or one hundred-piece puzzle.

These little ones display a sense of humor and can easily see the silliness of abstractions. They understand jokes or may be able to make up their own joke from incongruities. For example, a mother of a four-year-old girl told me that she decided to rest on the bed while her daughter was playing under this high-rise bed. The little girl said, "Well, I guess I am under arrest."

These children may also argue tirelessly with you when they want their own way and try to manipulate you into giving into them. Their reasons for doing something may be better than yours and you may find yourself wondering whose idea is better, your's or the child's. They are filled with "why" questions and perhaps can argue a better way to do something than you are currently doing.

They may prefer to play with children who are older than they are. They may actually seem to relate better to these children because, in essence, they have found someone closer to their true intellectual functioning and reasoning abilities. These children are extremely sensitive and easily hurt. Their emotional dimension does not match their intellectual dimension. They

may still want to cling onto mommy but in the next moment will want to discuss a sophisticated concept with her. They may want to do everything perfectly. They become easily frustrated if they cannot master a task quickly or with perfection.

Recalling details may be a strength as well as being very observant. It is not unusual for a two or a three year old child to recognize the stop sign before the parent actually stops the car. The child might actually stretch his hand out to represent stopping before the car comes to a stop. This action displays the connection between symbols and actions.

Physically, it is difficult to tell these children apart from other children. They have no physical attributes which set them apart. Children with advanced intellectual abilities exist in all socio-economic strata, all races, and varying environmental backgrounds. Identification is important in helping these little ones to understand and to recognize the potential which they possess. Nurturing them in a fashion which will help them develop optimally is extremely important. These children can be easily misunderstood, and unrealistic demands and expectations may be placed on them because of their advanced

reasoning abilities. It is important to note that in spite of those advanced reasoning abilities, they are still children and will act as such.

Reflect on your child's activities and see if he or she displays any of the characteristics described above. Note the detail of the characteristics and the frequency in which they occur. You just might have one of those advanced abilities children.

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**BOOK REVIEW EXCERPTS FROM GIFTED EDUCATION NEWS-PAGE APRIL-MAY 2002**

**Uncle Tungsten: Memories of a Chemical Boyhood (2001) by Oliver Sacks. New York: Alfred A. Knopf.** This is a wonderful memoir of growing up in England in the 1940's and 1950's by an outstanding medical writer and MD. Sacks describes how the mentor relationship with his uncle, a chemist and entrepreneur, stimulated his desire to become a scientist. His parents, who were physicians, sent him to the safety of a private school in the country during the German bombing of London (World War II -- Battle of Britain). This was a traumatic experience for a young boy separated from a loving and deeply religious Orthodox Jewish family. Unfortunately, he was seriously mistreated by the owners of this school, and suffered mentally from the hateful headmaster and school bullies. (George Orwell and Freeman Dyson have described similar experiences in English private schools.) As a six-year old, Sacks had an intense fascination with prime and Pythagorean numbers which helped him to mentally escape from the oppressive private school environment. After returning to London in the summer of 1943 at the age of ten, he began visiting his Uncle Tungsten (nicknamed after the metal) again and studying chemistry with him. In regard to this mentor relationship, he said: "Above all, I delighted in being able to visit Uncle Tungsten again – his place, at least, seemed relatively unchanged (though tungsten was now in somewhat short supply, because of the vast quantities needed for making tungsten steel for armor plating). I think he also delighted in having his young protégé back, for he would spend hours with me in his factory and his lab, answering questions as fast as I could ask them. . . ." (p. 34).

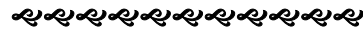
Sacks' childhood and early adolescent passions were chemistry, photography and reading. His family encouraged these passions by allowing him to set up his own chemistry and photo labs. His father served as a model for reading and the love of books. All of these interests and family culture eventually led to his becoming a neurologist and the author of several excellent books.

We highly recommend **Uncle Tungsten** as an instructive autobiography concerned with the development of a highly gifted individual. Additional books by one of the greatest living medical writers that gifted students should read are: (1) **The Man Who Mistook his Wife for a Hat and Other Clinical Tales** (1970); (2) **Awakenings** (1973) – made into a movie of the same name in 1990, starring Robert De Niro and Robin Williams; (3) **A Leg to Stand On** (1984); and (4) **Seeing Voices** (1989).

**Churchill: A Biography (2001) by Roy Jenkins. New York: Farrar, Straus and Giroux.** Many biographies have been written about Winston Churchill (1874-1965), but what makes this book unique is that the author was involved in British politics for nearly 50 years as a member of Parliament and holder of various cabinet positions. He also served in the House of Commons during

the period following World War II when Churchill was a member. This book is an amazing recounting of the life and difficult times of one of world history's greatest politicians and statesmen. It is a massive volume (1002 pages) that shows Churchill in all phases of his heroic life – as the son of a British aristocrat and descendent of the Duke of Marlborough, his development as a military officer at the Royal Military Academy at Sandhurst, his work as a fearless journalist and prisoner during the Boer War in South Africa, his participation in British politics beginning in 1900 at the age of 26 years, his writing career which covered British current events and history, his active participation in managing government affairs through many high level cabinet posts, and the pinnacle of his career as Prime Minister during World War II.

What is most impressive about Churchill's life is his determination to achieve greatness. Jenkins' book provides extensive documentation concerning how Churchill used each phase of his career to reach his overriding goal of making significant contributions to his nation and the world. If one individual can be identified as having saved Western society from almost certain destruction by Adolph Hitler and his Nazi barbarians, it is Winston Churchill. He bolstered England against overwhelming odds of a Nazi invasion and takeover through his rousing speeches and influence on President Franklin Roosevelt (through Harry Hopkins who was Roosevelt's aid), and on the United States in the war against Nazi Germany. The second half of Jenkins' book shows how Churchill provided the leadership skills to inspire both the English and Americans to victory. Now, we have the new Nazis to deal with in the form of various terrorist organizations such as al Qaeda. Gifted students will find that this book provides a wealth of historical information about the life and times of one of the greatest leaders of Western democracy. Important books by Winston Churchill: (1) **History of the English Speaking Peoples**. (1956-58). London: Cassell & Co.; and (2) **Memoirs of the Second World War: An Abridgement**. (1991). New York: Houghton Mifflin Co.



### **The 20<sup>th</sup> Century's Political Conscience: George Orwell by Michael E. Walters**

#### **Center for the Study of the Humanities in the Schools**

The attacks on the World Trade Center on September 11, 2001 have changed the political and cultural landscape of the United States, since this was the first time that the United States was the victim of an attack on mainland America. As reflected in the recent election results, concerns for national security have become the focus of the voting public. Now, it appears that there will be a military campaign against Saddam Hussein. Despite issues of national security, there are many individuals in our country who oppose any military activity. Gifted students will benefit from a recent book on the British writer George Orwell, **Why Orwell Matters** (Basic Books, 2002), written by Christopher Hitchens, a former staff writer for The Nation magazine and a current writer for Vanity Fair magazine. Although Hitchens has written many books and articles critical of the United States (e.g., **The Trial of Henry Kissinger**, Verso Books, 2001), the events of September 11<sup>th</sup> have led him to support the policies of President Bush. Mr. Hitchens perceives that we are in a state of War with Islamic Fundamentalists. He wrote the book on Orwell as an argument for his new concerns.

George Orwell was an independent Leftist, and he remained a member of the British Labor Party throughout his life. However, he was one of the harshest critics of all forms of totalitarian thought, whether from the Nazis or Stalinists. He was especially sensitive to the apologists for totalitarian regimes. Within a four-year post World War II period, he published two major political novels of the 20<sup>th</sup> century. These were **Animal Farm** (1945) and **Nineteen Eighty-Four** (1949). Both books keenly analyzed the language of political totalitarianism. He showed how these types of regimes manipulate human logic. The puppet regimes in Eastern Europe from 1946 until the early 1990s were defined by their Soviet occupiers as "peoples' democracies." If you sought political and religious self-expression, you were jailed as an "enemy of the state." Yet, many of the intellectual elites of the West (e.g., Jean Paul Sartre) either supported Stalinist suppression or were silent about this state of affairs. At the end of World War II, Orwell wrote a special introduction to the Ukrainian version of **Animal Farm** but copies were confiscated by the U.S. Army and handed over to the Red Army as an act of appeasement to the Communists. George Orwell was basically isolated during his lifetime by both the totalitarians of the Right and Left who considered him to be a dangerous nuisance. An example was the charge made by the British Marxist scholar, Raymond Williams, that Orwell had spoiled the morale of a whole generation (Hitchens, p. 45).

**Why Orwell Matters** will bring to gifted students an understanding of how language can be manipulated for political purposes. Also, it illustrates why a flawed democracy is superior to a perfected totalitarian regime. Gifted students will find **Why Orwell Matters** to be both intellectually stimulating and insightful as to why democracy matters.

"The disputes and debates and combats in which George Orwell took part are receding into history, but the manner in which he conducted himself as writer and participant has a reasonable chance of remaining as a historical example of its own. . . ." (Hitchens, p. 205).