Appropriate Practices for Screening, Identifying and Serving Potentially Gifted Preschoolers

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The U.S. Department of Education
and
The University of Southern Mississippi

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This document was designed as a tool to assist school districts in appropriate practices to screen, identify, and instruct potentially gifted preschoolers. Copies of this document will be forwarded to Mississippi public school districts serving pre-kindergarten children and community Head Start organizations.

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Preface

A paucity of research exists in the area of identifying and serving the potentially gifted preschool child. The research reported in this manual was designed to create a model for screening, identifying, and serving these children. Preschool children in the state of Mississippi were assessed for potential giftedness using the Draw-A-Person Intellectual Ability Test (DAP:IQ). Currently, a public education mandate exists in Mississippi to serve intellectually gifted children in grades two through six. One of the goals of this study was to raise awareness of the need to identify and serve intellectually gifted children at a young age.

The project resulted in the following outcomes: 1) a developmentally appropriate screening instrument for intellectual giftedness was field tested; 2) training sessions to raise awareness of the characteristics of potentially gifted preschoolers were held across the state; 3) public relations materials on giftedness in preschool children were distributed; and 4) a resource book for teachers and parents on recognizing and guiding potentially gifted preschool children was developed.

Characteristics of Gifted Preschoolers

Giftedness occurs in the population from infancy through adulthood. While gifted preschoolers are less frequently acknowledged within the gifted education research and literature, they can be described as those who show promise of performing at high levels because of their advanced or accelerated development (Clark, 2002; Smutny, 1998). The precocious development of very young children may occur in linguistic skills, motor skills, cognitive skills, academic aptitude, music and art, and personal or interpersonal skills, although it is not limited to these categories.

One of the first and most influential studies to determine characteristics of young gifted children was the longitudinal study by Lewis Terman in 1925 of 1,528 children having an IQ of 135 or above. Terman was able to establish retrospectively that the exceptionally gifted children were able to walk about one month earlier and develop language 3.5 months earlier than the moderately gifted children. Approximately 50 percent of the gifted children in the study could read before they entered school (Shurkin, 1992). Since Terman's time, research has expanded in the direction of early development of giftedness, and a consensus has developed that giftedness in very young children has many dimensions beyond a simple measure of intelligence.

Many types of giftedness (such as artistically gifted, for example) require an amount of time for cultivation that preschoolers are generally too young to have had. Within the early childhood period, the child may not yet have had the opportunity or experience required to translate potential into performance. At such an early stage, giftedness may be determined by the "general ability factor," rather than by specific

talents (Tannenbaum, 1992). Gifted preschoolers often show early linguistic skills including verbal and reading, as well as early motor development, and social emotional maturity. Their early development is seen as affecting the whole child with the recognition that each precocious ability, particularly during the early childhood period, has significant impact on the other areas of development. Therefore, in addition to their strengths and developmental advances, there are many other emotional and personality characteristics that are shared among very young gifted children.

Gifted children of all ages are often characterized by asynchronous development. For example at the age of 4 or 5, a child who carries on intelligent conversations with adults may not be able to tie his or her own shoes. Particularly for the preschool-aged child, the balance among the social-emotional, intellectual, and motor development is noticeably uneven (Perez, 1980; Roeper, 1977). The National Association for the Education of Young Children (NAEYC) states in their principals of developmentally appropriate practice that "development proceeds at varying rates from child to child as well as unevenly within different areas of each child's functioning" (Bredekamp & Copple, 1997, p.10). In regard to the need to succeed, young gifted children may be discouraged by their feelings and physical development. These children can often visualize and describe difficult motor skills such as climbing a jungle gym or building an intricate block structure but may try to find an excuse not to participate, avoiding the task until they know they can do it. On the other hand, they may exhibit great frustration in their attempts to perform the task, if they are not successful. Thus, the gifted child's insistence on perfectionism may inhibit some types of risk-taking, particularly in areas where the child feels he or she has less proficiency (Perez, 1980).

Linguistic Developmental Strengths

One of the most common characteristics of the very young gifted is early speech. The precocious emergence of language is salient because it has significant impact on the other areas of development. It is also firmly acknowledged in the literature with regard to infants and toddlers because normative data exists for the early years (Robinson, 1987). At age 2, an extensive vocabulary and agile use of language in a young gifted child will be remarkably evident. Early development of exceptional verbal ability is often considered to be a sign or characteristic of giftedness (Damiani, 1997; Gross, 1999; Klein, 1992; Roeper, 1977). Therefore, various intelligence tests such as the Wechsler Scales (2002) measure linguistic abilities as a subtest or subscale. Precocious verbal ability is characterized by advanced vocabulary for age; use of language in an original and meaningful way; and richness of expression, elaboration, and fluency (Eby & Smutny, 1991; Kitano, 1985; Perleth, Lehwald, & Browder, 1993).

In her study of exceptionally gifted children, Gross (1993) recorded linguistic precocity far beyond even that of moderately gifted. The mean age at which 15 children in her study spoke their first word was 9.7 months with a standard deviation of 4.85. The gifted children were able to link words into meaning earlier and with greater degrees of complexity than were their age peers. Early and fluent speech was also linked to excellent memory. Children in the study could recite poetry, passages from books, and songs before the age of 2.

Most importantly, early speech enables young gifted children to express their ideas, seek information through questioning, and interact verbally with their parents and other family members at an age when other children are only beginning to experiment

with oral communication. According to Abroms (1981), advanced language development is a social characteristic of the gifted toddler. She states "given the isomorphic relation between language and social cognition, language is a significant marker of underlying social development" (p.6). While children's language skills affect their ability to establish social relationships with adults and other children, their skill in social interaction can either support or encumber their language development (Bredekamp & Copple, 1997).

Emotional Sensitivity

One of the most outstanding characteristics of young gifted children is their high level of emotional sensitivity, which allows for the early development of values, empathy, and responsibility. A young gifted child may demonstrate a strong concern for others and their feelings (Hafenstein & Tucker, 1995; Perez, 1980). Their compassion is not limited to others, in fact, intellectually able children tend to display good self-concepts and social-emotional adjustment, more self-awareness, and self-reflection through their behaviors and comments (Hafenstein & Tucker,1995; Jacobs, 1971; Kitano, 1990). However, this same sensitivity may also lead to intra- and interpersonal conflict (Kitano, 1990). Gifted preschoolers may struggle with feelings of being different, a need for recognition and impatience with others.

A wide range of emotions comes into play for the young gifted child. A preschool gifted child not only has to "cope with the reality of the world but also with his/her own superior ability of understanding this reality in more depth than others" (Roeper, 1977, p. 389). Gifted preschoolers show more than average sharing and helping behaviors, more reactions to others' signs of distress, more sensitivity to the needs and

concerns of their fellow students and more affection for others (Abroms & Gollin, 1980; Perez, Chassin, Ellington, & Smith, 1982). For example, a young gifted child may act out in a way that is appropriate for his or her age, yet realizes the consequences of this type of behavior more than others of the same age. Because of the understanding that certain actions bring adverse consequences, the young gifted child may develop feelings of guilt that would not occur with an average child.

Emotional intensity is a common personality characteristic of the gifted. Young emotionally intense gifted children may be described as "hyperactive" or "distractible." Yet the term overexcitability should not be confused with hyperactivity. It is natural for young gifted children to feel deeply and to experience a broad range of emotions. In fact, emotional intensity fuels the motivation for achievement. The Polish psychiatrist and psychologist, Kazimierz Dabrowski, developed the theory that sensitivity and emotional intensity is a part of the psychosocial makeup of gifted individuals and viewed these intensities as positive potentials for further growth (Piechowski, 1992). According to Dabrowski, developmental potential includes talents, special abilities, intelligence, and five forms of psychic overexitability: psychomotor, sensual, intellectual, imaginational, and emotional (Hafenstein & Tucker, 1995). In Hafenstein & Tucker's case study of five young gifted children, ages three and four, it was determined that all five subjects exhibited behaviors characteristic of Dabrowski's theory of psychic overexcitability. For example, the relationship aspect of emotional overexitability allowed for development of values, empathy, and responsibility in the study's subjects. Bouchard (2004) clarifies the term overexcitabilities (OE) not as abilities or intelligences, but as modes of experiencing

the world. For example, a child with intellectual OE will do well on IQ tests, but these tests do not really measure the intensity of that child's *need to know.*

Social Development

By age three, the gifted are clearly social cognizers (Abroms & Gollin, 1980). Social cognition refers to the way the child comes to understand the thoughts, emotions, and viewpoints of others. Young children who are gifted in the area of social cognition may exhibit generosity, sharing of possessions, sympathy for others, and the desire to attend to other's needs at an early age.

Interactions with other children may also be a challenge for the intellectually able preschool child. Young gifted children have an early awareness of their differences, and they may engage in social comparisons somewhat earlier than other children who are at the same chronological age but are considerably less advanced mentally than gifted children (Abroms, 1981; Feldhusen, & Kolloff, 1979; Robinson, 1993). The potential for developing the characteristics of perfectionism may stem from their ability to judge themselves by the performance of peers in addition to their own expectations. It is also possible that this early recognition of differences may lead to regression in verbal and reading skills as young gifted children seeks to mimic the behavior of their age peers (Gross, 1999).

For the most part, however, advanced social development leads to healthy patterns of play and interaction. Young gifted children are incredibly resourceful, and they are apt to apply their excellent memory for people and the functions they can perform to their social interactions (Abroms, 1981). Jacobs (1971) found that gifted kindergarteners have a greater awareness of the emotional interplay between the

individual and the environment and greater sensitivity to the emotional pressures of the environment.

Play Style

Play style is often a reflection of advanced social development in young gifted children. Through play, one can see a child's social, emotional, and cognitive development (Bredekamp & Copple, 1997). When a gifted preschooler chooses to play alone, his or her pursuits tend to be quite complex and goal directed (Wright, 1990). Yet in contrast to the stereotype of the gifted child who is bookish, introverted, and overly serious, young gifted children are often quite physically active in play and more socially advanced in play style. Compared to average preschoolers, gifted girls and boys tend to initiate play sessions with other children and to play more cooperatively (Barnett, & Fiscella, 1985; Lupkowski, 1989). In these group play sessions, the gifted child will often coordinate and integrate multiple complementary roles, taking into consideration the actions of other children. In this complex management of cooperative play, gifted preschoolers direct movement away from egocentric thought toward decentralized thought, which is a trait more typical of six and seven-year-olds (Wright, 1990).

The young gifted child tends to modify conventional activities and objects, using numerous creative, unique, and imaginative ways to render them more social (Barnett & Fiscella, 1985; Wright, 1990). Their use of unconventional objects in play activities and diverse play interactions suggest that their need for environmental stimulation may be greater. Perhaps when exposed to the same resource materials over a long period of time, gifted preschoolers become bored and seek new avenues for play. Barnett & Fiscella (1985) found that when the same objects were available in the preschool

classroom to both the gifted and nongifted children, the gifted children tended to use materials in a novel way and modify the play interactions with their peers.

Because of their high verbal abilities, gifted preschoolers are able to convey their ideas more easily to their peers, to communicate their feelings, and to give directions (Perez, et al. 1982). While Wright (1990) also found that gifted preschoolers have a preference for associative play, in their cooperative play groups, gifted preschoolers most often orchestrated dramatic episodes, characterized by rich and complex themes. Given these budding leadership qualities, it is not surprising that young gifted children are often sought out by peers for companionship, ideas, and decisions (Kitano, 1982).

The advanced cognitive development of the young gifted child is also linked to a mature sense of humor for their age (Barnett & Fiscella, 1985; Eby & Smutny, 1991; Gross, 1993; Perez, 1980). Perez (1980) conducted an informal study of young gifted children's response to humor. She found they were more likely to respond to riddles and verbal associations rather than the visual humor, which is usually found in books for young children. This more mature sense of humor may contribute to isolation from age-level peers. Perez states that adults may also react negatively to a young child's sharp and incisive sense of humor.

Fears

The domains of children's development (i.e. physical, social, emotional, and cognitive skills) are closely related and influenced by each other. For example, increased mobility in babies and toddlers allows them to explore their world, and this expansion also affects their cognitive development (Bredekamp & Copple, 1997). Young gifted children internalize a great deal of input from their environments, and they are more

sensitive to problems than their age-mates (Perez, 1980). In fact, adults often underestimate their sensitivity to the concerns of the adult world. Parents are not likely to discuss issues such as death, divorce, financial problems, and violence with their very young child. Yet it is likely that the child is aware of these concerns and may, because of an incomplete or false understanding of the situation, fall victim to doubts, fears, and guilt feelings (Feldhusen & Kolloff, 1979). Roeper (1977) states "one of the differences between the gifted and the average child is that the gifted child loses innocence earlier" (p. 391). Because of his or her cognitive development, the gifted preschooler has a deep understanding of situations and consequences but is lacking coping skills due to limited life experiences. Young gifted children may experience feelings of helplessness when they perceive a threat because of their lack of knowledge of available support. These feelings may escalate to the point that the child worries he or she will be subjected to unpredictable forces which they will not be able to control. Knowing his or her own vulnerability and inability to control, solve, or withstand problems such as war, death, and disaster, the child may develop severe and overwhelming fears (Cohen, 1989; Perez, 1980). Yet the gifted child is characterized by a unique coping mechanism. Because of these strong feelings of danger in the world, he or she may develop a highly specialized area of interest in the cause of such disasters, such as the tectonic movements of earthquakes or the flight safety equipment on various aircrafts, in an effort to overcome his or her fears. These early interests in special areas and themes often noted in young gifted children can be seen as an extension of control behaviors (Cohen, 1989).

Curiosity is a common characteristic of young gifted children, and it is often noted that they pursue interests in meaningful and profound ways. The gifted child

typically integrates large amounts of acquired information into their knowledge base. On the basis of their knowledge, they are able to critically analyze consequences and make decisions about how to further pursue their interests. Even at an early age, the curiosity and pursuit of interests by gifted children is marked by a clear goal orientation (Perleth, Lehwald, & Browder, 1993).

Cognitive and Achievement Related Skills

When gifted young children are tested using standardized intelligence tests, they may have extraordinarily high performance in some areas but not necessarily in all cognitive ability areas. At a very early age, infants have a tendency to spend more time focusing visually on some objects more so than others. Fagan (1984) states infants pay more attention to novel objects than those previously viewed. When Fagan studied children at seven months and then again at three years and five years, he found that early novelty preferences were highly related to later intelligence.

The ability to form analogies at a very young age and to justify those responses may be another indicator of giftedness. Analogies are a type of reasoning ability that represents a novel or non-entrenched task (Caropreso & White, 1994). Using Sternberg's triarchic theory of intellectual giftedness, Caropreso and White (1994) explain that non-entrenched tasks are those that require processing types of information that are outside of an individual's familiar experiences. In their study of 108 four-, five-, and six-year-olds, Caropreso and White found the subset of 55 gifted students demonstrated higher levels of analogical reasoning than the nonidentified children based on their scores on the Test of Analogical Reasoning in Children (TARC).

Several cognitive and achievement-related behaviors are prominent in preschool-aged gifted children. Kitano (1985) found that in addition to demonstrating high levels of accumulated knowledge and thinking abilities, preschool gifted children also showed evidence of prelogical thinking, discomfort with ambiguity, creativity, and spontaneous incorporation of academic activities into free play. Perhaps as a reflection of the gifted child's greater language fluency, gifted preschoolers also talk about problems, rules, and goals to a greater extent than do their average ability peers (Moss, 1992). Metacognition refers to the way children deal with a problem. Some metacognitive strategies are trial and error, checking and comparing different possibilities, or reflecting on the problem-solving processes (Perleth, Lehwald, & Browder, 1993). Moss (1992) provides another example of metacognitive skills in that gifted children more frequently reality test and monitor their own activities. Studies investigating strategy use and metacognition in preschool-age children most likely involve interaction with a parent or other adult (Kanevsky, 1992; Moss, 1990, 1992). For example, in Kanevsky's (1992) study, four- and five-year-old children were given puzzles to solve in the presence of a supportive tutor who was available both to answer questions and to offer help. The young intellectually gifted children were more able to evaluate their own need for assistance. They asked for help and denied assistance when they felt that they could solve a step in the puzzle on their own, whereas the average four- and five-year-olds seldom denied help and generally accepted the tutor's offer to help. Kanevsky (1992) found that young gifted children were more like older gifted children in their engagement, independence, and self-monitoring. Furthermore, the young gifted children were more economical and efficient in their strategy development. According to Kanevsky (1992), their efficiency

points to the differences in metacognition, which explain individual differences in memory, learning, and problem-solving abilities.

Academic Achievement

Although several academic disciplines require a good amount of time and persistent training to build a knowledge base, as is the case with numerical and mathematical expertise, young gifted children can often show promise in certain academic behaviors (Perleth, Lehwald, & Browder, 1993; Tannenbaum, 1983). Even as infants, gifted children showed significantly greater goal directness, longer attention spans, and more responsiveness in testing situations (Damiani, 1997). Pletan, Robinson, Berninger, and Abbott (1995) found that kindergarten-age children who showed signs of math precocity, indeed, had more complex reasoning skills and memory skills such as verbal reasoning skills, ability to remember complex information, and ability to decode other symbolic systems such as maps and written language. Precocious readers also excelled in text reading speed (both oral and silent), phonetic analysis to identify nonsense words, and spelling of dictated words (Burns, Collins, & Paulsell, 1991; Jackson, 1992). It has been noted that precocious readers' preference for rapid reading facilitates comprehension. It is possible that precocious readers have learned that plunging through the text at the most rapid pace is the best way to absorb and enjoy its contents (Jackson, 1992).

Conclusion

There are many individual characteristics that are used to describe the young gifted child. However, it is important to remember that a child is a total entity. A preschool-aged gifted child may present just a few of these traits or perhaps a

combination of many characteristics. Many strengths of the preschool gifted child significantly impact other areas of development. The domains of very young children's developmental skills are closely related and influenced by each other. However, it is most likely that their abilities will unfold in an uneven fashion. Each child develops in a unique way and different areas of each child's functioning may appear at varied stages. Within the early childhood period, a variety of opportunities and experiences may be required in order to translate potential into performance.

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Matrix of Characteristics of Preschool Gifted Children

Characteristic	Comment
Verbal skills including advanced vocabulary for age and use of language in original and meaningful ways.	Early speech enables young gifted children to express their ideas, seek information through questioning, and interact verbally with their parents and family members at an age when other children are only beginning to experiment with oral communication.
Asynchronous development	The balance among social-emotional, intellectual and motor development is usually uneven.
Emotional sensitivity	A young gifted child may demonstrate a strong concern for others and their feelings. This allows for early development of values, empathy, and responsibility.
Early awareness of difference	The potential for developing the characteristics of perfectionism may stem from the child's ability to judge him or herself by the performance of peers in addition to his or her own expectations.
Cooperative play style	The gifted preschooler will often initiate play sessions, coordinate, and integrate multiple complementary roles, taking into consideration the actions of other children.
Use of unconventional objects in their play activities	This suggests an increased need for environmental stimulation.
Leadership	They are frequently sought out by peers for companionship, ideas, decisions, and interact easily with peers.
Mature sense of humor	Gifted preschoolers may respond to riddles and verbal associations rather than the visual humor that is usually found in age-level children's books.
Sensitivity to problems	Because of an incomplete or false understanding of a situation, they may fall victim to doubts, fears, and guilt feelings.
Curiosity	They may integrate large amounts of information into their knowledge base, and interests are marked by a clear goal orientation.
Cognitive skills	They show evidence of reasoning, prelogical thinking, creativity, and spontaneous incorporation of academic activities into free play.
Metacognitive control	They are economical and efficient in developing strategies to solve problems.
Academic achievement skills	They are able to remember complex information and to decode other symbolic systems such as maps and written language.
Precocious reading	Rapid text-reading speed (both oral and silent) may be preferred because it facilitates comprehension.

Adapted from Barnett & Fiscella (1985); Caropreso (1994); Eby & Smutny (1991); Feldhusen & Kolloff (1979); Hafenstein & Tucker (1995); Jackson (1992); Kitano(1982); Perez (1980); and Robinson (1993)

Assessment of Giftedness in Preschoolers

Identifying the potential for giftedness that emerges in some preschool children is particularly important during the early years of rapid development. Without early identification, potentially gifted young children are at risk for developing early signs of underachievement, characterized by lack of interest in academic endeavors and a tendency to hide their abilities in order to appear more similar to the typically developing children with whom they are associated in the school setting. Intellectual precocity in young children is often coupled with typically developing gross- and fine-motor skills, a condition known as asynchronous development. It is this characteristic that is most troublesome in the identification of potentially gifted young children. Testing instruments that tap the mental abilities of these students are not often designed to meet the needs of small children who do not yet know how to hold a pencil correctly, may not be able to read, or who are unable to maintain the level of attention necessary to complete the test. For these reasons, it is crucial for decision makers to be aware of developmentally appropriate testing practices and procedures that have been developed specifically for young children.

The term "developmentally appropriate" has come from the fields of early childhood education and early intervention and is commonly understood to be "the idea that curriculum and instructional practices should be consistent with the ways that children of a given age develop and learn and should be responsive to their individual and cultural needs and experiences" (Shepard, Taylor, & Kagan, 1996, p.3). Developmental appropriateness does not, however, mandate that children be grouped together within an age group, but as the term itself implies, that they be treated in a manner that is

appropriate for their own individual level of cognitive, social-emotional, and physical development.

Characteristics of Developmentally Appropriate Assessment

Determining developmentally appropriate assessment methods and procedures for potentially gifted preschool children necessitates a review of both the gifted and early childhood education literature. By combining criteria developed by Johnsen (2004), who specializes in identification of gifted students, and Wortham (2005), whose research focus has been in the area of developmentally appropriate assessment of young children, it is possible to align appropriate practices in both fields in order to create a model for the identification of potentially gifted young children.

Alignment of Characteristics of Gifted Students with Program Options

The criteria that should be used for assessment comes from the goals of the individual program in which children will be enrolled. A logical first step in determining what criteria will be used for assessment is to evaluate the program for which testing will be completed. What is the definition of giftedness that is espoused by the particular program? What does the program propose to help children learn? What personal characteristics of the children will be a good match for the goals of the program? Once these types of questions have been answered, the next step is to target those characteristics that have been determined to be the most logical indicators for children who can benefit from a given program. Following these decisions, research should be conducted concerning which assessments should be used for proper identification of the characteristics that were identified. While this approach focuses on the existence of an established or emerging program for serving gifted students in a school setting, parents of

young children can also ask similar questions regarding the types of opportunities that they are providing for their children at home.

Purpose for Assessment

According to Shepard (1994), "the content of assessments should reflect and model progress toward important learning goals" (p. 209). It is important, in choosing assessments, to evaluate the ways in which assessment results will be used to benefit the child. While many assessments are intended for use as screening and identification instruments to identify students for program participation, other assessments are more appropriately used for different purposes. Beyond the initial identification of students for a program, assessments can be used for guiding curriculum development for an individual student or for a group of students. The purpose must be determined prior to an assessment being administered. Questions to ask at this point include the following: What skills or curriculum objectives should be measured and how? What other concerns should be addressed in relation to a specific student? What will be done with the assessment once it has been completed? Assessment of this type could potentially be used for placement within various levels of instruction, modifying curriculum in order to ensure the inclusion of advanced content, process, and product, or referral for other services.

Variety of Measures

As early as 1964, research indicated that reliance on only one measure of intellectual ability to determine a young child's inclusion in a given program was inappropriate practice (Bloom, 1964). Vacc and Ritter (1995) indicate that young children should be assessed across a variety of developmental areas. Further,

assessments used with young children should be criterion-referenced, process oriented, informal, indirect, and accommodating for children with disabilities in order to emphasize the strengths of the individual child (Vacc & Ritter, 1995). The National Association of School Psychologists (NASP; 2002) has also found that variety in assessment includes not only multiple instruments but also information from multiple settings and observers. It is essential that each of the measures included in the assessment package be both valid and reliable for use with young children. Decision makers should be cautious when determining which tests to use with preschool children. In the past, tests that were created as IQ screening instruments were used inappropriately to determine either advanced or underdeveloped ability to perform on classroom activities and to prevent children from beginning kindergarten (NEGP, 1998; Shepard & Taylor, 1996; Shepard, 1994). These activities, in effect, kept children from being exposed to classroom experiences and removed them from settings where they could benefit from instructional intervention that would help to correct the deficiencies found through the testing process. According to the definition of giftedness found in the Jacob K. Javits Act (PL 107-110 Subpart 6; PL-107-110 sec. 9101 (22)), intellectual ability and academic ability are two distinct areas of performance and should therefore be assessed differently.

Multiple Assessments Over Time – Evaluating Student Progress and Program Effectiveness

Because of the variations in developmental rates between children and the asynchronous development within individual children, it is important to monitor growth across a range of areas including physical and motor development, social-emotional

development, intellectual development, and academic development over time. Children process information in a variety of ways that are different from adults and that depend on their preferred methods of and experiences with learning. According to the National Association for the Education of Young Children and the National Association of Early Childhood Specialists in State Departments of Education (NAEYC & NAECS/SDE, 2003), this variation makes it difficult to develop tests for use with all children at very young ages. Developmental measurements target primarily physical development in infants and only begin to address other areas around the ages of three to four (NAEYC & NAECS/SDE, 2003). In order to understand a child's pattern of growth across all developmental areas, assessment must be ongoing and tied to learning objectives.

Strategies for Implementation of Developmentally Appropriate Assessment

As stated previously, assessments that are criterion-referenced, process oriented, informal, indirect, and accommodate for children with disabilities provide a more complete picture of the abilities of young children (Vacc & Ritter, 1995). Criterion referencing ensures that children are assessed based on what is actually taught. Criterion-referenced assessments include teacher-created tests and/or those produced by a district or state that include questions regarding the established curriculum. For gifted children, teacher-created assessments may be most appropriate because gifted programming, by definition, builds skills and concepts beyond those codified for use in the regular classroom by local and state entities.

Process-oriented assessments measure a child's ability to perform a task using thinking patterns or organizational patterns that are difficult to assess using standardized tests. Assessments of this kind typically require a child to gather information and use it

to produce an original product that will be evaluated through the use of a checklist, rubric, or similar type of instrument. Informal assessment may be conducted through the use of observational records that are kept by the parent or teacher. In this type of assessment, parents or teachers may use a checklist to indicate specific skills for which the child has shown mastery, or they may keep an observation diary in which they record information about things a child has said or done that indicates his or her current level of development in the areas of intellectual, social-emotional, and physical development. Finally, tests that make accommodations for disabilities allow children to perform in areas of strength without being hindered by weaknesses. The strategies and characteristics of developmentally appropriate practice ensure that children's strengths are emphasized during the identification process. Highlighting these strengths also ensures that children receive the appropriate level and depth of instruction. Another benefit of providing instruction based on this type of identification process is the ability of teachers to develop a greater depth of understanding of the characteristics and needs of gifted individuals (Wortham, 2005).

Research

Brain Development and IQ Testing

Formal IQ testing has been used to develop an understanding of the development of intellectual constructs as shown in studies conducted by Damiani (1997) and Tideman and Gustafsson (2004). According to Damiani (1997), the Fullerton study followed 107 children born in California from birth through age eight. Children were not predetermined to be gifted or non-gifted but were described in detail according to the time of reaching important developmental milestones such as language and motor skills

development. The Wechsler Intelligence Scale for Children-Revised (WISC-R) was administered to children at the age of eight and giftedness or non-giftedness was identified at that time. The previous annual findings of the developmental milestones were evaluated for similarities and differences among and between the gifted and non-gifted groups. The results of the Fullerton study indicate "differences in intellectual ability, as measured by traditional assessment methods, emerged in these children as early as 1 ½ years of age" (Damiani, 1997, p. 19). Specific characteristics of the gifted group in infancy included "greater goal directedness, longer attention spans, and more responsiveness to the tester and test materials . . . and the difference remained consistent over ages 5 to 8" (Damiani, 1997, p. 19). The most significant finding of the Fullerton study was that young gifted children required more attention from their parents at all ages and that the families of the gifted group tended to be characterized by high levels of involvement, nurturing, and providing enriching environments (Damiani, 1997). The study also reinforced the characteristic behaviors of good memory and advanced vocabulary.

In the study conducted by Tideman and Gustafsson (2004), the Wechsler Preschool and Primary Scale of Intelligence – Revised (WPPSI-R) was used to show the rate of neurological differentiation in children between the ages of three and seven. Previous tests using the Wechsler Scales had not provided the depth of information sought by the researchers due to the normative sample's lower limit of four years of age. The most current revision of the WPPSI-R, however, included children as young as three years and zero months in the normative sample, which allowed the researchers to study "more of the important early period of cognitive development" (Tideman & Gustafsson,

2004, p. 1972). This study was based on research that found the development of the central nervous system progresses from one of general development in both halves of the brain to one of increasing differentiation and specialization in each hemisphere of the brain. Using the WPPSI-R allowed the researchers to identify a parallel development of memory, processing speed, and metacognitive functioning, which occurs around the age of five and allows children to function more efficiently on standardized tests of intellectual development (Tideman & Gustafsson, 2004).

Formal Testing for Other Characteristics of Potential Giftedness

While several other areas may be assessed through the use of standardized testing procedures, adaptability and leadership deserve special attention.

Adaptability.

Adaptive behavior includes any behavior that allows children to analyze their environment and to develop the personal communication, social, and living skills necessary to successfully navigate that environment. Douthitt (1992) notes that the American Association on Mental Retardation requires deficits in both intelligence and adaptive behavior in order for an individual to be diagnosed with mental retardation. She posits, "If it is necessary to use both constructs . . . to label an individual as being on one end of the cognitive functioning continuum, why not the other?" (Douthitt, 1992, p. 149). Douthitt (1992) used the Vineland Adaptive Behavior Scale (VABS) to evaluate 296 children whose IQs ranged from 96 to 164 on the basis of adaptive behavior. Gifted children (those with IQs in excess of 132) were found to score higher on the communication, socialization, and daily living skills subtests of the VABS than non-gifted children. No difference was discovered for the motor skills subtest.

Leadership.

Research on leadership in young children is limited. Hensel (1991) conducted research that evaluated the leadership capabilities of young children before and after exposure to instruction in social sensitivity, problem solving, and conflict resolution. Hensel reported previous studies using the Peabody Picture Vocabulary Test (PPVT) found children's leadership skills were closely related to their verbal ability and the subsequent ability to relate ideas and communicate feelings to others. Hensel's study focused on using proven methods such as the PPVT and the sociogram developed by Perez in 1982. Questions on the sociogram were the following:

1) Who is your best/favorite friend in the class?
2) Whom should the teacher choose to help her teach the children?
3) Whom would you choose to play with on the playground?

(Perez et al., 1982, p. 26)

Hensel also observed children in the classroom setting to determine whether their answers had indeed pinpointed the natural leaders in the classroom. When asked to define leadership, the children tended to describe actions rather than provide verbal definitions (Hensel, 1991). Following the initial portion of the study, Hensel introduced a unit of study focused on developing the ability to see situations from other's perspectives by using role-playing and creative drama followed by discussions of each character's emotions in the dramatic situation. Seeming to echo the words of Leta Hollingworth in her study of children with IQs in excess of 180 (Morelock & Feldman, 2003), Hensel's final evaluation of the project included this statement,

> Our observations suggested that the children were more aware of their classmates' feelings, found ways of assisting their classmates more frequently, and were able to articulate more clearly their understanding of the perspective of others. In some cases, parents commented that these behavioral changes were also observable at home. . . Gifted children have the intellect to provide leadership, but they must also develop effective social skills in order to assume leadership positions. (p. 6)

The intellectual, adaptive, and leadership characteristics that are common among gifted preschoolers create a variety of opportunities for both observation and identification of these children.

Studies Involving the Reliability and Validity of the Identification Procedure

Current methods of identification for preschool children in a given area may be limited by the current practice of the local schools. Many schools rely on tests that are recommended only because they offer the most recent normative sample. This is particularly evident in the occurrence of schools using the WISC-R rather than the Stanford-Binet LM (SBLM), which was published only two years prior. The emphasis placed on using the most current normative sample has taken away from the ability of school districts to look at the appropriateness of the test constructs when determining which is best to use in identifying gifted students (Silverman & Kearney, 1992). While many researchers tout the Wechsler Intelligence Scale for Children Third Edition (WISC-III), WPPSI-R, and the Stanford-Binet Fourth Edition (SBIV) for use in all educational testing (Robinson, 1992), others provide reasons for relying on the older SBLM for use in both gifted and special education applications (Silverman & Kearney, 1992).

Silverman and Kearney (1992) quote Elizabeth Hagen, one of the authors of the SBIV, as stating

> The compromise is to produce an instrument that is most effective in the range of +/- 4 [standard deviations]: therefore you can't use tasks that are successfully completed by 99.99 percent of an age group or that are failed by 99.99 percent of an age group. In the construction of the Binet [Revision IV], I was working with some nonverbal items that could only be solved by children who were in classes for the gifted. You can't put items like that in an intelligence test because they aren't functional in a wide enough group. (p. 34)

This statement alone should be a cause for concern in both gifted and remedial educational fields. On tests of intelligence, there are typically a few high-level questions that only gifted students can answer successfully. Conversely the few low-level questions present on the test may be the only ones that students with disabilities can answer successfully. When these types of questions are left out of a test of intelligence, it forces both groups of students to perform, for the purposes of the test, just like students who are closer to the mean. Silverman and Kearney (1992) have found that the overall increase in intelligence in the general population accounts for an adjusted IQ score that decreases by approximately eight points in a 20-year time span. The newer tests (WISC-III, WPPSI-R, and SBIV) have adjusted the score on a point per year basis, in effect eliminating one entire standard deviation (Silverman & Kearney, 1992). They indicate that when students who were previously identified as gifted participated in norming samples for the newer tests, their scores were an average of 14 points lower on the new tests than the scores they received that qualified them for inclusion in a gifted program. Some change in scores is to be expected in retesting, however, in this case, the

manipulation of the test itself seems to be the cause of the magnitude of the difference. Although the shift in scores is dramatic, it would not be problematic if test authors indicated the difference in their testing manuals. According to Silverman and Kearney (1992), many of the test authors continued to recommend a high score as the cut off point for giftedness even after finding that the previously identified gifted children who took the test scored much lower on average.

Studies Involving Screening Processes

Many districts (even those who actively seek out gifted preschoolers) rely on population estimates to indicate the number of students who are enrolled in their gifted programs. A 1993 study of preschool giftedness in Louisiana indicated that incidence rates of gifted preschoolers far exceeded the projections for the area based on population estimates (Sandel & McCallister). This discrepancy is an indication of both the lack of current research of effective testing measures and the continued need for more research. The lack is seen in the fact that less than one-fifth of the gifted preschoolers in that area would have been identified by the recommended available testing measures for the preschool group (Sandel & McCallister, 1993). The need for a continuation of research is indicated by the fact that the remaining preschoolers were identified through a seldom-utilized multilevel identification approach. Students in this study were identified by a three-step process, including referral, screening, and evaluation. These steps do not seem very different from what is evident in current practice, but with closer inspection, differences are more readily understood. The referral process went much deeper than a referral from a classroom teacher. Researchers

took advantage of the full range of media and community services for disseminating information about the program and gaining feedback from parents, community programs, and schools (Sandel & McCallister, 1993).

In the second step of the process, certified teachers of the gifted were involved in conducting 30-minute parent interviews, 30-minute interactions with the potentially gifted child, observing the child in a play situation, scoring a questionnaire in which parents discussed the child's interests and abilities, and administering the Hess School Readiness Test and the Peabody Picture Vocabulary Test-Revised. Interviews with teachers or referrals from pediatricians were also examined when necessary (Sandel & McCallister, 1993).

After the file was completed, a committee made up of the teacher who conducted the observations, the project director, and a clinical psychologist decided on the next course of action. At this point students were recommended or not recommended for further testing. Profiles of students who were recommended for further study were measured against state requirements for inclusion in programs for the gifted, and the students whose profiles indicated possible giftedness were given a standardized test of intelligence as prescribed by the state (Sandel & McCallister, 1993).

This multilevel process found 16 highly gifted students where population estimates indicated a maximum of three (Sandel & McCallister, 1993). While the multilevel process did, indeed, find many more children than was expected, this finding brings the discussion of testing difficulties full circle. Even after the elaborate child search and case study process that was used, the last step of the

process was the use of standardized tests to finalize the decision of whether or not students were included in gifted programming. Silverman and Kearney (1992) have presented evidence that the reliance on deviation IQ scores (where scores are forced into a normal distribution around a mean), such as those used in the Wechsler Scales, focus much too highly on the use of the Gaussian curve indicating increasingly smaller numbers of people at higher levels of IQ. After discovering that more individuals are found to be highly gifted than the normal distribution would indicate, Ravens (1959) noted, "it might be the assumption about what reality should be like, and not the obtained distributions of test scores, which was wrong" (p.70). This belief led Ravens to avoid using deviation IQs and to rely more on ratio IQs (that relate scores as a ratio of intellectual age to chronological age) when developing Ravens Progressive Matrices (1976). Ratio IQs in the Ravens (1976) are similar to those used on the SBLM. While multilevel identification processes certainly increase the number of children referred for testing as well as increase the confidence that the referred children will be gifted, IQ tests remain a substantial part of the identification process of which parents and teachers should be aware.

Ongoing Research of Screening Procedures – Human Figure Drawings

Because the field of preschool gifted education is still quite small, more research needs to be conducted on the characteristics, identification, and teaching methods that will enhance the development of gifted preschoolers throughout their years in school. Particularly, screening instruments that are efficient and effective in relation to time and cost need to be identified in order to expedite the process of moving young children into

more appropriate programming that will target the development of their potential. In an effort to fill this void, Reynolds and Hickman (2004) have developed the Draw-A-Person Intellectual Ability Test for Children, Adolescents, and Adults (DAP:IQ). The DAP:IQ is the newest of a family of testing instruments that require the test subjects to create a human figure drawing (HFD). The concept of using children's drawings to predict intellectual ability has existed for decades, but opinions about each child's ability were primarily dependent on the subjectivity of the teacher or other observer (Abell, VonBrieson, & Watz, 1996). In order to remedy this situation, Goodenough created an objective means with which to score children's drawings during the mid-1920s. Goodenough's Draw-A-Man test was later revised and renamed the Draw-A-Person test. The scoring systems for HFD tests are based on the idea that as children develop physically and mentally, their drawings will show an increasing awareness of and attention to detail. In fact, Koppitz (1968), who developed an alternative scoring system for HFDs in the 1960s, states

> The HFD is not regarded as a portrait of the child's basic and enduring personality traits nor as an image of the child's actual appearance. Instead, it is believed that HFDs reflect the child's current stage of mental development and his attitudes and concerns of the given moment. (p. 4)

The emphasis on attitudes to which Koppitz refers draws attention to another use of HFDs that gained credence following Goodenough's development of the Draw-A-Man test. Many educators and psychologists began to use, and continue to use, HFDs to develop an understanding of the stressors that are present in a child's life at a given point in time.

While this use of HFDs is still widely practiced and has been reported to be one of the top 10 most popular tests used by professional psychologists (Abell, Wood, & Liebman, 2001; Motta, Little, & Tobin, 1993), the validity of using the tests in this manner has been questioned (Motta, Little, & Tobin, 1993; Smith & Dumont, 1995). Motta, Little, and Tobin (1993) cite evidence that the practice of using specific items from HFDs to diagnose a psychosis has little predictive utility. Examples of items that have been inappropriately used for such a purpose include placement of the drawing on the page; erasures, omissions, or inclusion of internal organs; size, shading, or symmetry of the head or body; features of specific body parts such as the mouth, teeth, or eyes. Many psychologists, however, continue to use this type of information in a manner that is inappropriate for patient diagnosis (Smith & Dumont, 1995). In fact, 87 percent of clinical and counseling psychologists participating in studies of HFD use such features to make or confirm diagnoses about a client (Smith & Dumont, 1995).

Whether or not HFDs are valid for projecting psychosis in children, there has been extensive research indicating that HFDs are useful for making predictions about the intellectual capacity of children. HFDs have been found to be significantly correlated with other measures of intellectual development (Abell, Wood, & Liebman, 2001; Abell, Horkheimer, & Nguyen, 1998; Wisniewski & Naglieri, 1989; Koppitz, 1968). Abell, Horkeimer, and Nguyen (1998) compared the correlations of two HFDs, the Goodenough-Harris Drawing Test and the House-Tree-Person (H-T-P) test by Buck (1966), to WISC-R scores. The Goodenough-Harris was found to have a moderate correlation to the WISC-R full

-scale score ($p < .01$) and a slightly higher correlation with the WISC-R performance scale ($p < .001$). The H-T-P test was found to have slightly higher correlations with the WISC-R Full Scale and Performance scales, both with $p < .001$. Although both tests were found to have slight correlation with the WISC-R Verbal scale, it is at a lower level of significance ($p < .05$). In a more recent study, Abell, Wood, & Liebman (2001) examined the comparative validity of three scoring systems for HFDs and the WISC-R and WISC III. The study showed that the Goodenough-Harris Draw-A-Person test and Naglieri's Draw-A-Person test were moderately correlated to WISC-R and WISC-III scores with a high level of significance ($p < .001$). The Ayres-Reid HFD system did not provide standardized scores; the results from this method were compared to the other two, based on the age of the child tested and raw scores on both of the other measures. These comparisons yielded strong correlation scores ($r = .83$ to $r = .85$) between the raw scores on all three tests that were statistically significant ($p < .001$).

The Draw A Person: A Quantitative Scoring System (DAP) is Dr. Jack A. Naglieri's version of an HFD test published in 1988. This member of the HFD family requires subjects to draw a man, woman, and the self. Each drawing is scored individually, and the total score is a compilation of the scores from each of the three pictures (Wisniewski & Naglieri, 1989). The DAP has been extensively researched for its correlation to the Matrix Analogies Tests, the Multilevel Academic Survey Test series, and the WISC-R. The research concerning these three measures allows for a knowledge of the relationship between scores on the

DAP and a screening instrument, an achievement measure, and an intelligence measure.

Studies concerning the Matrix Analogies Test and the Multilevel Academic Survey Tests indicated statistically significant correlations despite the fact that the DAP yielded slightly higher scores. The study comparing the DAP and the WISC-R indicates that the two measures are correlated at a level that is statistically significant and that the DAP yielded scores that were consistently around four points lower than those on the WISC-R. Post hoc comparisons of the various scales within each test indicate that the nonverbal DAP was correlated with both the verbal and performance scales of the WISC-R (Wisniewski & Naglieri, 1989). According to the authors, this "indicates that the system related similarly to verbal and nonverbal intelligence despite the fact that the test uses a nonverbal medium" (Wisniewski & Naglieri, 1989, p. 349).

Although many of the correlations reported in these studies were not robust, they were statistically significant, and the lower correlations were accounted for by the HFD's intended use as screening instruments that do not require the "solution of complex progressive matrices" (Wisniewski & Naglieri, 1989, p.347) as do the longer and more formal intellectual measures. The existence of these correlations, coupled with the ease of administration, ability to test in a group setting, and high inter-rater reliability for the scoring systems, point to the use of HFDs as a useful screening instrument. In fact, research indicates that when individuals obtain HFD scores above the 80th percentile and the scores are supported by formal IQ testing, the results are more indicative of

high ability than using HFDs alone (Abell, Wood, & Liebman, 2001; Motta, Little, & Tobin, 1993; Koppitz, 1968). Other factors that make HFDs useful for intellectual screening are their nonverbal format and ease of administration in a variety of settings (Abell, Horkheimer, & Nguyen, 1998), not to mention that drawing is an activity with which most children are familiar. Further, the fact that some HFD scoring intervals are normed on a half- or quarter-year basis (Abell, Horkheimer, & Nguyen, 1998) may indicate that HFDs are more able to measure the rapid developmental growth that has been found to exist in young children (Tideman & Gustafsson, 2004).

Other aspects of HFDs that make them good for use with kindergarten-age children are supported by the work of Koppitz (1968). Koppitz developed a scoring system for HFDs such that each testing group could be normed against itself. In her research, Koppitz (1968) used the terms exceptional, not unusual, common, and expected to refer to the items on HFDs that children at a certain age were developmentally ready to produce. Expected items were defined as those that were included in 86-100 percent of children's drawings; common elements were defined as those included in 51-85 percent of drawings; not unusual items were defined as being included in 16-50 percent of drawings; exceptional items were defined as being included in less that 15 percent of drawings (Koppitz, 1968). Koppitz recommends these categories be used to indicate ranges of intellectual functioning rather than single IQ scores, allowing HFDs to be used for screening purposes rather than single indicators of giftedness. Based on this principle, current research on HFDs uses the 85th percentile as the indication of

giftedness. Koppitz's (1968) work also indicates that performance on HFD tests was not affected by previous school experience or art instruction.

As stated previously, the DAP-IQ is the newest addition to the HFD family and was developed in order to increase the age range for which HFDs could be successfully used (Reynolds, & Hickman, 2004). The DAP-IQ is normed on a half-year basis and included 2,295 individuals ranging in age from 4 to 89 years old in the normative sample (Reynolds, & Hickman, 2004). Correlation studies were also completed regarding the DAP-IQ's relationship to other measures of intelligence. The DAP-IQ showed reliability that was correlated with both the Koppitz (r =.85 to .86) and Goodenough-Harris (r = .86) scoring systems. Validity studies of the DAP-IQ indicate correlations with IQ scores on the WISC-III for Verbal (r = .33), Performance (r = .49), and Full Scale (r = .46) components, all of which were statistically significant ($p \leq .01$) (Reynolds & Hickman, 2004). The DAP-IQ is also correlated to the Woodcock-Johnson –Revised Tests of Achievement in the areas of reading (r = .39), mathematics (r = .46), written language (r = .41), and early skills (r = .51) all with statistical significance of $p \leq .05$ (Reynolds & Hickman, 2004).

Conclusion

The identification of the potential for giftedness in preschool age children is not new. The views expressed here have been contemplated for many years. In fact, some current theories that insist giftedness is reserved for those adults who have cultivated their abilities from a young age (Gagné, 2003; Tannenbaum, 2003; Johnsen, 2004) are based on the combined knowledge of many institutions and individuals who have devoted

their efforts to understanding childhood giftedness (Bloom, 1964: NASP, 2002; NAEYC & NAECS/SDE, 2003; NEGP, 1998; Tideman & Gustafsson, 2004). Bloom (1964) compared the normative results of IQ tests administered to children over a wide range of age groups (6 months to 18 years). In this comparison, it was discovered that placing the test results from all age groups on a graph created a trend line, or IQ curve, that depicted the increase in general intellectual development from one age to another. This work raised awareness of the vast importance of the early years of a child's life by showing that the greatest rate of increase occurred between the ages of one to three. The formation of intellectual constructs, as shown through IQ scores, continued to increase at a rapid rate until approximately eight or nine years of age. For many years the reasons underlying this rapid increase in IQ scores was unknown.

More recently, however, Tideman and Gustafsson (2004) have shown a link between stages of neurological and developmental growth stating that, "changes in psychological test performance [are] a reflection of brain development" (section 1). This discovery explains the importance of presenting new and varied information to children during the most rapid periods of neuron and synapse growth and organization, which typically occurs between the ages of three and seven. While this period of rapid growth and development provide an excellent opportunity for parents and teachers to present new and varied information from which children can learn, it also poses a serious challenge for accurately testing a child's intellectual, academic, creative, and leadership abilities. Due to the rapid development of children's neurological network during this time, it is difficult to find testing instruments that accurately portray all of a student's strengths in a manner that will be easily verified at later stages in life.

This difficulty, however, must not serve as a stumbling block to current researchers. While constructs of intellectual development have been found to increase well into the adult years (Kangas & Bradway, 1971), the rapidity and breadth of brain development slows after a child reaches eight or nine years of age. Instead, the brain trades breadth for depth and begins to further differentiate the structures that it has already developed in a fundamental manner (Tideman & Gustafsson, 2004). Too long have opportunities for enhancing the abilities of young gifted children slipped by unnoticed. Research must continue to address the needs of young gifted children in order to ensure that parents and educators are able to provide appropriate instruction that is designed to address the special developmental needs of young children.

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Screening and Identification Instruments

One of the goals of this report is to provide current information regarding the various assessment instruments that are available for use with young gifted children. In light of this goal, a thorough search was conducted for measures that reported normative samples including young children. While the results of this search were many, they are by no means exhaustive, and focus primarily on the cognitive functioning of young children. The inclusion of instruments in these tables is not intended as endorsement.

Each entry has been assigned an A, B, or C classification which follows common classifications used by publishers. "A" indicates that the instrument may be used by most people in an educational setting, regardless of qualification. "B" indicates that the instrument may be administered by individuals holding a master's degree in education or psychology, or by those who are licensed through various psychometric agencies. "C" indicates that the instrument may be given by individuals who hold a doctoral degree in education or psychology or who are licensed psychometrists or psychiatrists. These classifications represent the best efforts of researchers to fairly represent the qualifications stated by each publisher. However, readers are reminded that because each publisher uses a different classification system, it is important to review the publisher's qualification requirements before making final decisions regarding instrumentation.

Decision makers are urged to review each instrument carefully following the guidelines for developmentally appropriate assessment in order to evaluate its usefulness for a given program or student. The information provided is the most current information available as of the time of printing, however, the field of testing is dynamic and readers are urged to consult the publishers' Web sites in order to locate any new information concerning revisions or normative updates.

Cognitive Abilities Scale-Second Edition (CAS-2)

Author(s): Sharon Bradley-Johnson and C. Merle Johnson

Publisher/Distributor: PRO-ED

Publisher's Address: 8700 Shoal Creek Boulevard, Austin, TX 78757-6897

Web site: www.proedinc.com

Date of Publication: 2001

Group or Individual: Individual

Administration: Specialized training required

Ages/Grades: 3 months – 3 years

Alternate Forms: None listed

Administration Time: 20 – 30 minutes

Scoring Method: Hand

Validity: Publisher reports content, concurrent, construct, and predictive validity

Reliability: Publisher reports internal consistency and interscorer reliability

Standardization: Publisher reports normative sample of 1,106 individuals demographically matched to 1997 U.S. Census

Scores Obtained: Quotients, percentiles, and age equivalents

Areas Assessed: General Cognitive Quotient (GCQ) and Nonvocal Cognitive Quotients (NCQ) assessed through oral language, reading, math, writing, and enabling behaviors

Cognitive Abilities Test, Form 6 (CogAT)

Author(s): D.F. Logan and Elizabeth P. Hagen

Publisher/Distributor: Riverside Publishing

Publisher's Address: 425 Spring Lake Drive, Itasca IL 60143-2079

Web site: www.riverpub.com

Date of Publication: 2001

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Grades K-12

Alternate Forms: None listed

Administration Time: More than two hours

Scoring Method: Hand or computer

Validity: Publisher reports content, construct, and criterion validity

Reliability: Publisher reports internal consistency and test-retest reliability

Standardization: Publisher reports normative sample of 180,538 individuals demographically matched to 2000 U.S. Census

Scores Obtained: Standard age score, percentile and stanine ranks by age and grade

Areas Assessed: Cognitive ability

Das·Naglieri Cognitive Assessment System (CAS)

Author(s): J.P. Das and Jack A. Naglieri

Publisher/Distributor: Riverside Publishing

Publisher's Address: 425 Spring Lake Drive, Itasca, IL 60143-2079

Web site: www.riverpub.com

Date of Publication: 1997

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: 5 to 17 years

Alternate Forms: Standard Battery and Basic Battery

Administration Time: 40 – 60 minutes

Scoring Method: Hand or computer

Validity: Publisher reports content, construct, and criterion validity

Reliability: Publisher reports internal consistency and test-retest reliability

Standardization: Publisher reports normative sample of 2,200 individuals demographically matched to U.S. Census

Scores Obtained: Scale scores and standard scores

Areas Assessed: Intelligence defined as the four cognitive processes of the Planning, Attention, Simultaneous, Successive (PASS) theory

Detroit Tests of Learning Aptitude-Primary: Third Edition (DTLA-P:3)

Author(s): Donald D. Hammill and Brian R. Bryant

Publisher/Distributor: PRO-ED

Publisher's Address: 8700 Shoal Creek Boulevard, Austin, TX 78757-6897

Web site: www.proedinc.com

Date of Publication: 1991

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 3-9

Alternate Forms: None listed

Administration Time: 15 to 45 minutes

Scoring Method: Hand

Validity: Publisher does not report

Reliability: Publisher does not report

Standardization: Publisher reports normative sample demographically matched to 2001 U.S. Census

Scores Obtained: Quotients, percentiles and age equivalents

Areas Assessed: Cognitive ability, language, attention, and motor abilities

Differential Ability Scales (DAS)

Author(s): Colin D. Elliott

Publisher/Distributor: PsychCorp, a brand of Harcourt Assessment, Inc.

Publisher's Address: 19500 Bulverde Road, San Antonio, TX 78259

Web site: www.PsychCorp.com

Date of Publication: 1990

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Preschool Level – ages 2.6 to 5.11 years; School-Age Level - ages 6 to 17.11

Alternate Forms: No alternate forms available; DAS is stratified into two levels for preschool and school age children

Administration Time: 45-65 minutes

Scoring Method: Hand or computer

Validity: Author reports criterion and construct validity

Reliability: Author reports internal consistency, test-retest, and confidence interval reliability

Standardization: Publisher reports normative sample of 3,475 individuals demographically matched to U.S. Census

Scores Obtained: Percentiles, standard scores, T-scores, grade equivalents and grade percentiles, and age-based standard scores

Areas Assessed: General conceptual ability, literacy, numeracy, cognitive intellectual functioning

Draw-A-Person Intellectual Ability Test for Children, Adolescents, and Adults (DAP: IQ)

Author(s): Cecil R. Reynolds and Julia A. Hickman

Publisher/Distributor: PRO-ED

Publisher's Address: 8700 Shoal Creek Boulevard, Austin, TX 78757-6897

Web site: www.proedinc.com

Date of Publication: 2004

Group or Individual: Group and individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 4-89

Alternate Forms: None

Administration Time: Test is untimed; estimated to be 5-10 minutes

Scoring Method: Hand

Validity: Publisher reports content, construct, and criterion validity

Reliability: Publisher reports test-retest and interscorer reliability

Standardization: Publisher reports standardization sample of 2,295 individuals demographically matched to U.S. Census

Scores Obtained: Raw scores, percentile rank, stanines, T-scores, z-scores, age and grade equivalency

Areas Assessed: Cognitive development

Gifted and Talented Evaluation Scales (GATES)

Author(s): James E. Gilliam, Betsy O. Carpenter, and Janis R. Christensen

Publisher/Distributor: Prufrock Press

Publisher's Address: P.O. Box 8813, Waco, TX 76714-8813

Web site: www.prufrock.com

Date of Publication: 1996

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: 5 to 18 years

Alternate Forms: None listed

Administration Time: Untimed

Scoring Method: Hand

Validity: Publisher reports content and construct validity

Reliability: Publisher reports internal consistency and test-retest reliability

Standardization: Publisher reports normative sample of 1,083 individuals in 32 states demographically matched to 1990 U.S. Census

Scores Obtained: Raw scores, standard scores, and percentile ranks

Areas Assessed: Intellectual ability, academic skills, creativity, leadership, and artistic talent

Gifted Evaluation Scale – Second Edition (GES-2)

Author(s): S.B. McCarney and P.D. Anderson

Publisher/Distributor: Hawthorne Educational Services

Publisher's Address: 800 Gray Oak Drive, Columbia, OH 65201

Web site: www.hes-inc.com

Date of Publication: 1998

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: 5 to 18 years

Alternate Forms: None listed

Administration Time: 15 – 20 minutes

Scoring Method: Hand or computer

Validity: Publisher reports content, construct, and criterion validity

Reliability: Publisher reports test-retest reliability, interrater reliability, and internal consistency

Standardization: Publisher reports normative sample of 1,439 students from 15 states and all U.S. geographical regions

Scores Obtained: Standard scores, quotient scores, and percentile rank

Areas Assessed: Intellectual, creativity, specific academic aptitude, leadership ability, and performing and visual arts; optional motivational scale available

Gifted Rating Scales – Preschool/Kindergarten Form (GRS-P)

Author(s): Steven I. Pfeiffer and Tania Jarosewich

Publisher/Distributor: PsychCorp, a brand of Harcourt Assessment, Inc.

Publisher's Address: 19500 Bulverde Road, San Antonio, TX 78259

Web site: www.PsychCorp.com

Date of Publication: 2003

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 4 -6

Alternate Forms: Publisher lists a rating scale for children ages 6-13

Administration Time: 5-10 minutes

Scoring Method: Hand

Validity: Publisher reports concurrent validity

Reliability: Publisher does not report

Standardization: Publisher reports standardization in conjunction with Wechsler Preschool and Primary Scale of Intelligence-Third Edition (WPPSI-III)

Scores Obtained: Comparative scores ranked according to various definitions of giftedness

Areas Assessed: Intellectual ability, academic ability, motivation, creativity, and artistic talent

Kaufman Assessment Battery for Children, Second Edition (KABC-II)

Author(s): Alan S. Kaufman and Nadeen L. Kaufman

Publisher/Distributor: American Guidance Service, Inc

Publisher's Address: 4201 Woodland Road, Circle Pines, MN 5504-1796

Web site: www.agsnet.com/index.asp

Date of Publication: 2004

Group or Individual: Individual

Administration: Specialized training required

Ages/Grades: Ages 3-18

Alternate Forms: One form used, may be interpreted according to Luria or Cattel-Horn Carroll (CHC) models of intelligence

Administration Time: Luria model – 25 to 55 minutes; CHC model – 35 to 70 minutes

Scoring Method: Hand or computer

Validity: Publisher does not report

Reliability: Publisher does not report

Standardization: Publisher reports normative sample of 3,025 individuals demographically matched to U.S. Census: 450 children ages 3-4; 400 children ages 5-6

Scores Obtained: Age-based standardized scores, age equivalents, and percentile ranks

Areas Assessed: Mental processing, fluid-crystallized intelligence, and nonverbal intelligence

Kaufman Brief Intelligence Test, Second Edition (KBIT-2)

Author(s): Alan S. Kaufman and Nadeen L. Kaufman

Publisher/Distributor: American Guidance Service, Inc

Publisher's Address: 4201 Woodland Road, Circle Pines, MN 5504-1796

Web site: www.agsnet.com/index.asp

Date of Publication: 2004

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 4 to 90

Alternate Forms: None listed

Administration Time: 20 minutes

Scoring Method: Hand

Validity: Publisher reports concurrent validity

Reliability: Publisher reports internal consistency and test-retest reliability

Standardization: Publisher reports normative sample of 2,120 individuals demographically matched to U.S. Census

Scores Obtained: Standard scores and percentile ranks by age

Areas Assessed: Verbal and nonverbal intelligence

Kaufman Survey of Early Academic and Language Skills (K-SEALS)

Author(s): Alan S. Kaufman, and Nadeen L. Kaufman

Publisher/Distributor: American Guidance Service Inc.

Publisher's Address: 4201 Woodland Road, Circle Pines, MN 55014-1796

Web site: www.agsnet.com

Date of Publication: 1993

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 3-6

Alternate Forms: None listed

Administration Time: 15-25 minutes

Scoring Method: Hand

Validity: Publisher reports internal correlation, content, construct, concurrent, and predictive validity

Reliability: Publisher reports internal and test-retest reliability

Standardization: Publisher reports normative sample of 1,000 individuals demographically matched to U.S. Census

Scores Obtained: Age-based standard scores, percentiles, descriptive categories, and age equivalents

Areas Assessed: Expressive and receptive language skills, pre-academic skills, and articulation

Leiter International Performance Scale-Revised (Leiter-R)

Author(s): Gale H. Roid and Lucy J. Miller

Publisher/Distributor: Stoelting Co.

Publisher's Address: 620 Wheat Lane, Wood Dale, IL 60191

Web site: www.stoeltingco.com/tests

Date of Publication: 1997

Group or Individual: Individual

Administration: Specialized training required

Ages/Grades: 2 through 20 years

Alternate Forms: None reported

Administration Time: 90 minutes

Scoring Method: Hand or computer scoring

Validity: Publisher reports content criterion and construct validity

Reliability: Publisher reports internal consistency, test-retest reliability, standard errors of measurement, and test information curves

Standardization: Publisher reports normative sample of 2,482 children and youth

Scores Obtained: IQ scores, visualization and reasoning scores, attention and memory scores diagnostic information, and growth scores

Areas Assessed: Nonverbal cognitive ability

Naglieri Nonverbal Ability Test (NNAT)

Author(s): Jack A. Naglieri

Publisher/Distributor: PsychCorp, a brand of Harcourt Assessment, Inc.

Publisher's Address: 19500 Bulverde Road, San Antonio, TX 78259

Web site: www.PsychCorp.com

Date of Publication: 2003

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 5-17

Alternate Forms: Forms A and B available

Administration Time: 25-30 minutes

Scoring Method: Hand

Validity: Publisher reports content, construct, and criterion validity

Reliability: Publisher reports internal consistency and test-retest reliability

Standardization: Publisher reports normative sample in excess of 1,500 individuals demographically matched to current U.S. Census

Scores Obtained: Standard scores, percentile ranks, and age equivalents

Areas Assessed: Nonverbal intelligence

Otis Lennon School Ability Test 8th Edition (OLSAT 8th Edition)

Author(s): Arthur S. Otis and Roger T. Lennon

Publisher/Distributor: Harcourt Assessment Inc.

Publisher's Address: 19500 Bulverde Road, San Antonio, Texas 78259

Web site: www.harcourtassessment.com

Date of Publication: 2004

Group or Individual: Group

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: grades K-12

Alternate Forms: Three forms are available

Administration Time: Maximum of 75 minutes

Scoring Method: Hand or machine

Validity: Publisher reports validity measures

Reliability: Publisher reports reliability measures

Standardization: Publisher reports standardization sample representative of all major ethnicities

Scores Obtained: Percentile rank, stanine, and normal curve equivalency are reported by age and grade

Areas Assessed: Verbal and nonverbal intelligence

Peabody Individual Achievement Test-Revised Normative Update (PIAT-R /NU)

Author(s): Frederick C. Markwardt, Jr.

Publisher/Distributor: American Guidance Service, Inc.

Publisher's Address: 4201 Woodland Road, Circle Pines, MN 5504-1796

Web site: www.agsnet.com/index.asp

Date of Publication: 1998

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: 5-18 years

Alternate Forms: None listed

Administration Time: 60 minutes

Scoring Method: Hand or computer

Validity: Publisher reports content and concurrent validity

Reliability: Publisher reports confidence interval reliability

Standardization: Publisher reports normative sample information for each area assessed

Scores Obtained: Raw scores, grade equivalents, age equivalents, standard score, national percentile rank, normal curve equivalent score

Areas Assessed: Scholastic achievement in reading, spelling, mathematics, and writing

Peabody Picture Vocabulary Test – Third Edition (PPVT-III)

Author(s): Lloyd M. Dunn and Leota M. Dunn

Publisher/Distributor: American Guidance Service, Inc.

Publisher's Address: 4201 Woodland Road, Circle Pines, MN 5504-1796

Web site: www.agsnet.com/index.asp

Date of Publication: 1997

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 2 to 90

Alternate Forms: Two parallel forms available

Administration Time: 10-15 minutes

Scoring Method: Hand or computer

Validity: Publisher reports concurrent and criterion validity

Reliability: Publisher reports internal consistency, alternate-form, and test-retest reliability

Standardization: Publisher reports normative sample of 2,725 individuals demographically matched to 1994 U.S. Census

Scores Obtained: Age-based standard scores, percentile ranks, normal curve equivalents, stanines, and age equivalents

Areas Assessed: Verbal ability

Pictorial Test of Intelligence- Second Edition (PTI-2)

Author(s): Joseph L. French

Publisher/Distributor: PRO-ED

Publisher's Address: 8700 Shoal Creek Boulevard, Austin, TX 78757-6897

Web site: www.proedinc.com

Date of Publication: 2001

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 3-8

Alternate Forms: None listed

Administration Time: 15-30 minutes

Scoring Method: Hand

Validity: Publisher reports content-description, criterion-prediction, and construct identification validity

Reliability: Publisher reports coefficient alpha, test-retest, and interscorer reliability

Standardization: Publisher reports normative sample of 972 individuals demographically matched to 1997 U.S. Census

Scores Obtained: Percentiles, standard scores, and age equivalents

Areas Assessed: Verbal abstractions, form discrimination, and quantitative concepts

Raven's Progressive Matrices

Author(s): J.C. Raven, J.H. Court, and J. Raven

Publisher/Distributor: PsychCorp, a brand of Harcourt Assessment, Inc.

Publisher's Address: 19500 Bulverde Road, San Antonio, TX 78259

Web site: www.PsychCorp.com

Date of Publication: 1998

Group or Individual: Group and individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 5-11

Alternate Forms: Parallel forms are available

Administration Time: 15-30 minutes

Scoring Method: Hand

Validity: Publisher reports concurrent validity

Reliability: Publisher reports split-half and test-retest reliability

Standardization: Publisher reports separate normative samples for Britain, Ireland, Canada, Germany and the United States

Scores Obtained: Percentile ranks

Areas Assessed: Nonverbal cognition and intelligence

Reynolds Intellectual Assessment Scales (RAIS)

Author(s): Cecil R. Reynolds and Randy W. Kamphaus

Publisher/Distributor: Psychological Assessment Resources, Inc.

Publisher's Address: 16204 N. Florida Avenue, Lutz, FL 33549-8119

Web site: www.parinc.com

Date of Publication: 2003

Group or Individual: Individual

Administration: Specialized training required

Ages/Grades: Ages 3-94

Alternate Forms: None listed

Administration Time: 20-25 minutes

Scoring Method: Hand

Validity: Publisher reports content and factor-analysis validity

Reliability: Publisher reports standard error of measure and test-retest reliability

Standardization: Publisher reports a normative sample of 2,438 individuals demographically matched to the 2001 U.S. Census

Scores Obtained: Ninety and ninety-fifth percentile confidence intervals, percentile ranks, T-scores, z-scores, normal curve equivalencies, and stanines

Areas Assessed: Verbal and nonverbal ability

Scales for Identifying Gifted Students (SIGS)

Author(s): Gail Ryser and Kathleen McConnell

Publisher/Distributor: Prufrock Press

Publisher's Address: P.O. Box 8813, Waco, TX 76714-8813

Web site: www.prufrock.com

Date of Publication: 2004

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 5-18

Alternate Forms: School Rating Scales, Home Rating Scales, and Summary Form

Administration Time: 35-70 minutes per scale

Scoring Method: Hand

Validity: Publisher reports concurrent validity

Reliability: Publisher reports internal consistency reliability

Standardization: Publisher reports normative sample in excess of 3,600 individuals comprised of a general sample and a gifted sample

Scores Obtained: Raw scores, standard scores, and percentile ranks

Areas Assessed: Intellectual ability; ability in language arts, math, science, and social studies; creativity; and leadership

Screening Assessment for Gifted Elementary Students 2nd Edition (SAGES-2)

Author(s): Susan K. Johnsen and Anne L. Corn

Publisher/Distributor: Prufrock Press

Publisher's Address: P.O. Box 8813, Waco, TX 76714-8813

Web site: www.prufrock.com

Date of Publication: 2001

Group or Individual: Individual and group

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 5-14

Alternate Forms: None listed

Administration Time: Assessment is untimed, estimated at 30-45 minutes per subtest or total time between 1 ½ to 2 ¼ hours; recommended that younger students take various subtests on different days

Scoring Method: Hand

Validity: Publisher reports criterion validity

Reliability: Publisher reports internal, standard error of measurement, time sampling and interscorer reliability

Standardization: Publisher reports normative sample of 5,313 individuals broken into a normal sample and a gifted sample

Scores Obtained: Standard, quotient, and percentile scores are calculated

Areas Assessed: Aptitude and achievement

Slosson Intelligence Test-Primary (SIT-P)

Author(s): Bradley T. Erford, Gary J. Vitali, and Steven W. Slosson

Publisher/Distributor: Slosson Educational Publications, Inc.

Publisher's Address: P.O. Box 544, East Aurora, NY 14052-0544

Web site: www.slosson.com

Date of Publication: 1999

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 2-7

Alternate Forms: Two levels available, but no parallel forms listed

Administration Time: 10-25 minutes

Scoring Method: Hand

Validity: Publisher reports concurrent validity

Reliability: Publisher reports internal consistency reliability

Standardization: Publisher reports a normative sample of 825 children and is anchored to the Stanford-Binet Intelligence Scale: Fourth Edition

Scores Obtained: Total Standard Score, percentile ranks, and age equivalents

Areas Assessed: Verbal, performance, and cognitive ability

Slosson Intelligence Test, Revised (SIT-R3)

Author(s): Richard L. Slosson; revised by Charles L. Nicholson, and Terry Hibpshman

Publisher/Distributor: Slosson Educational Publications, Inc.

Publisher's Address: P.O. Box 544, East Aurora, NY 14052-0544

Web site: www.slosson.com

Date of Publication: 2002

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 4-65

Alternate Forms: None listed

Administration Time: 10-20 minutes

Scoring Method: Hand or computer

Validity: Publisher reports construct, content, and concurrent validity

Reliability: Publisher reports Kuder-Richardson reliability coefficients and split-half reliability

Standardization: Publisher reports normative sample of 2,000 individuals demographically matched to U.S. Census

Scores Obtained: Deviational IQs, standard scores, and percentiles

Areas Assessed: Information processing, comprehension, quantitative ability, similarities and differences, vocabulary, and auditory memory

Stanford-Binet Intelligence Scale, Fifth Edition (SB5)

Author(s): Gale H. Roid

Publisher/Distributor: Riverside Publishing

Publisher's Address: 425 Spring Lake Drive, Itasca, IL 60143-2079

Web site: www.riverpub.com

Date of Publication: 2003

Group or Individual: Individual

Administration: Specialized training required

Ages/Grades: 2 – 85 years

Alternate Forms: No alternate forms; may be used in conjunction with Stanford Binet Intelligence Scales for Early Childhood, Fifth Edition (Early SB5) for ages2-7, which includes new test observation checklist and parent report

Administration Time: 50 minutes

Scoring Method: Hand, computer, or publisher scores for a fee

Validity: Publisher reports content, construct, criterion

Reliability: Publisher reports internal consistency, test-retest, and interscorer reliability

Standardization: Publisher reports normative sample of 4,800 individuals demographically matched to 2000 U.S. Census

Scores Obtained: Standard scores, age-equivalency scores

Areas Assessed: Verbal and nonverbal intelligence, fluid reasoning, knowledge, quantitative reasoning, visual-spatial processing, and working memory

Test for Creative Thinking-Drawing Production (TCP-DP)

Author(s): Klaus K. Urban, and Hans G. Jellen

Publisher/Distributor: Swets Test Publishers [The Netherlands]
US Distributor: PsychCorp, a brand of Harcourt Assessment, Inc.

Publisher's Address: P.O. Box 820, 2160 Sz. Lisse, The Netherlands
US Distributor: 19500 Bulverde Road, San Antonio, TX 78259

Web sitewww.swetstest.nl
US. Distributor: www.PsychCorp.com

Date of Publication: 1996

Group or Individual: Group or individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 5-95

Alternate Forms: Two forms usually administered one after the other

Administration Time: 30 minutes

Scoring Method: Hand

Validity: Publisher does not report

Reliability: Publisher does not report

Standardization: Publisher does not report

Scores Obtained: General classification, percentiles, and T-scores

Areas Assessed: Creative potential

Test of Early Mathematics Ability- Third Edition (TEMA-3)

Author(s): Herbert P. Ginsburg and Arthur J. Baroody

Publisher/Distributor: PRO-ED

Publisher's Address: 8700 Shoal Creek Boulevard, Austin, TX 78757-6897

Web site: www.proedinc.com

Date of Publication: 2003

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 3-8

Alternate Forms: Forms A and B available

Administration Time: 40 minutes

Scoring Method: Hand

Validity: Publisher reports content, construct, and criterion validity

Reliability: Publisher reports internal consistency and test-retest reliability

Standardization: Publisher reports standardization sample of 1,219 individuals demographically matched to 2001 U.S. Census

Scores Obtained: Standard scores, percentile ranks, and age and grade equivalents

Areas Assessed: Formal and informal mathematical skills

Test of Early Reading Ability – Third Edition (TERA-3)

Author(s): D. Kim Reid, Wayne P. Hresko, and Donald D. Hammill

Publisher/Distributor: PRO-ED

Publisher's Address: 8700 Shoal Creek Boulevard, Austin, TX 78757-6897

Web site: www.proedinc.com

Date of Publication: 2001

Group or Individual: Individual

Administration: Specialized training recommended not required; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 3-8

Alternate Forms: Forms A and B available

Administration Time: Test is untimed; estimated at 30 minutes

Scoring Method: Hand

Validity: Publisher reports content and concurrent validity

Reliability: Publisher reports test-retest and interscorer reliability

Standardization: Publisher reports normative sample of 875 individuals demographically matched to 2000 U.S. Census

Scores Obtained: Raw scores, age and grade equivalents, percentile scores, standard scores, and confidence scores

Areas Assessed: Emergent literacy

Test of Early Written Language – 2nd Edition (TEWL-2)

Author(s): Wayne Hresko, Shelley Herron, and Pamela Peak

Publisher/Distributor: PRO-ED

Publisher's Address: 8700 Shoal Creek Boulevard, Austin, TX 78757-6897

Web site: www.proedinc.com

Date of Publication: 1996

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 3-10

Alternate Forms: Two parallel forms available

Administration Time: 30-45 minutes

Scoring Method: Hand

Validity: Publisher reports content, construct, and criterion-related validity

Reliability: Publisher reports internal consistency reliability

Standardization: Publisher reports normative sample in excess of 1,400 individuals demographically matched to 1990 U.S. Census

Scores Obtained: Subtest and global composites, normal curve equivalents, percentiles, and age equivalents

Areas Assessed: Early writing ability

Test of Mathematical Abilities for Gifted Students (TOMAGS)

Author(s): Gail R. Ryser and Susan K. Johnsen

Publisher/Distributor: PRO-ED

Publisher's Address: 8700 Shoal Creek Boulevard, Austin, TX 78757-6897

Web site: www.proedinc.com

Date of Publication: 1998

Group or Individual: Group and individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Grades K -6

Alternate Forms: None listed

Administration Time: 30-60 minutes

Scoring Method: Hand

Validity: Publisher reports content, construct, and criterion validity

Reliability: Publisher reports internal consistency, test-retest, and interscorer reliability

Standardization: Publisher reports normative sample of 1,572 individuals in a general group and 1,130 individuals in a gifted group

Scores Obtained: Percentile ranks and quotients

Areas Assessed: Mathematics ability

Tests of Memory and Learning (TOMAL)

Author(s): Cecil R. Reynolds and Erin D Bigler

Publisher/Distributor: PRO-ED

Publisher's Address: 8700 Shoal Creek Boulevard, Austin, TX 78757-6897

Web site: www.proedinc.com

Date of Publication: 1994

Group or Individual: Individual

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: Ages 5-19

Alternate Forms: None listed

Administration Time: 45 minutes

Scoring Method: Hand

Validity: Publisher reports criterion, construct, and content validity

Reliability: Publisher reports internal consistency, test-retest, and subtest reliability

Standardization: Publisher reports normative sample in excess of 1,000 individuals demographically matched to U.S. Census

Scores Obtained: Standardized scores, scaled scores, percentiles, composite scores and indexes

Areas Assessed: Verbal memory, nonverbal memory, delayed recall, and composite memory

Universal Nonverbal Intelligence Test (UNIT)

Author(s): Bruce A. Bracken and R. Steve McCallum

Publisher/Distributor: Riverside Publishing

Publisher's Address: 425 Spring Lake Drive, Itasca, IL 60143-2079

Web site: www.riverpub.com

Date of Publication: 1998

Group or Individual: Individual

Administration: Specialized training required

Ages/Grades: 5-17 years

Alternate Forms: Abbreviate Battery, Standard Battery, and Extended Battery

Administration Time:
Abbreviated Battery – 10-15 minutes
Standard Battery – 30 minutes
Extended Battery – 45 minutes

Scoring Method: Hand or computer

Validity: Publisher reports content, construct, and criterion validity

Reliability: Publisher reports internal consistency and test-retest reliability

Standardization: Publisher reports standardization sample of 2,100 individuals demographically matched to 1995 U.S. Census

Scores Obtained: Raw scores, scaled scores, confidence intervals, and test-age equivalents

Areas Assessed: Cognitive abilities: memory and reasoning

Wechsler Preschool and Primary Scale of Intelligence-Third Edition (WPPSI-III)

Author(s): David Wechsler

Publisher/Distributor: PsychCorp, a brand of Harcourt Assessment, Inc.

Publisher's Address 19500 Bulverde Road, San Antonio, TX 78259

Web site: www.PsychCorp.com

Date of Publication: 2002

Group or Individual: Individual

Administration: Specialized training required

Ages/Grades: Two age bands are listed: 2 years 6 months to 3 years 11 months and 4 years to 7 years 3 months

Alternate Forms: None listed

Administration Time: 30-60 minutes

Scoring Method: Hand or computer

Validity: Publisher reports construct, predictive, and concurrent criterion-related validity

Reliability: Publisher reports split-half, test-retest, alternate level, and standard error of measurement reliability

Standardization: Publisher reports efforts to include individuals with a wide range of demographic characteristics, paying special attention to traditionally underrepresented groups

Scores Obtained: Scaled scores by age

Areas Assessed: Fluid reasoning ability (matrix reasoning, picture concepts, and word reasoning)

Wide Range Intelligence Test (WRIT)

Author(s): Joseph Glutting, Wayne Adams, and David Sheslow

Publisher/Distributor: Wide Range Inc.

Publisher's Address Wide Range Inc., P.O. Box 3410, Wilmington, DE 19804-0250

Web site: www.widerange.com

Date of Publication: 2000

Group or Individual: Individual

Administration: Specialized training required

Ages/Grades: Ages 4-85

Alternate Forms: None listed

Administration Time: 30 minutes or less

Scoring Method: Hand

Validity: Publisher reports content, construct, and confirmatory-factor analysis validity

Reliability: Publisher reports internal consistency, test-retest, and interscorer reliability

Standardization: Publisher reports standardization on 2,285 individuals; publisher reports inclusion of 350 preschool children

Scores Obtained: Standard scores, percentile ranks, and confidence intervals

Areas Assessed: General, verbal, and visual intelligence

Wide Range Achievement Test 3 (WRAT3)

Author(s): Gary S. Wilkinson

Publisher/Distributor: Wide Range Inc.

Publisher's Address: P.O. Box 3410, Wilmington, DE 19804-0250

Web site: www.widerange.com

Date of Publication: 1993

Group or Individual: Group or individual administration for spelling and arithmetic; individual administration only for reading

Administration: No specialized training required to administer test; thorough familiarity with test administration and scoring procedures required

Ages/Grades: 5-75 years

Alternate Forms: Two equivalent forms are available

Administration Time: 15-30 minutes

Scoring Method: Hand or computer

Validity: Publisher does not report

Reliability: Publisher does not report

Standardization: Publisher reports national sample of 5,000 individuals

Scores Obtained: Raw scores, standard scores, percentiles, grade equivalents

Areas Assessed: Reading, spelling, and arithmetic

Woodcock-Johnson III Test of Achievement (WJ III)

Author(s): Richard W. Woodcock, Kevin S. McGrew, Nancy Mather, and Fredrick A. Schrank

Publisher/Distributor: Riverside Publishing

Publisher's Address: 425 Spring Lake Drive, Itasca, IL 60143-2079

Web site: www.riverpub.com

Date of Publication: 2001

Group or Individual: Individual

Administration: Specialized training required

Ages/Grades: Ages 2 – 90

Alternate Forms: Forms A and B plus an optional Handwriting Legibility Scale

Administration Time: 55-65 minutes

Scoring Method: Computer scoring; computer scoring software included in test packet

Validity: Publisher reports fundamental correlation analysis, confirmatory factory analysis, construct, and concurrent validity

Reliability: Publisher reports Rasch analysis, internal, split-half, and test-retest reliability

Standardization: Tests of Achievement and Tests of Cognition co-normed on sample ranging from preschoolers to adults

Scores Obtained: Raw scores, grade and age equivalents, percentile ranks, and discrepancy scores

Areas Assessed: Scholastic aptitude, oral language, and academic achievement

Woodcock-Johnson III Test of Cognitive Abilities (WJ III)

Author(s): Richard W. Woodcock, Kevin S. McGrew, Nancy Mather, and Fredrick A. Schrank

Publisher/Distributor: Riverside Publishing

Publisher's Address: 425 Spring Lake Drive, Itasca, IL 60143-2079

Web site: www.riverpub.com

Date of Publication: 2001

Group or Individual: Individual

Administration: Specialized training required

Ages/Grades: Ages 2 – 90

Alternate Forms: None listed

Administration Time: 35-45 minutes

Scoring Method: Computer scoring; computer scoring software included in test packet

Validity: Publisher reports fundamental correlation analysis, confirmatory factory analysis, construct, and concurrent validity

Reliability: Publisher reports Rasch analysis, internal, split-half, and test-retest reliability

Standardization: Tests of Achievement and Tests of Cognition were co-normed on a sample ranging from preschoolers to adults

Scores Obtained: Raw scores, grade and age equivalents, percentile ranks, and discrepancy scores

Areas Assessed: Intellectual ability and cognitive abilities

Matrix of Identification Instruments

Title, Acronym, and Publisher	Date of Publication	Group or Individual Administration	Training required for administration	Age /Grade Range	Alternate Forms	Administration Time	Scoring Method	Areas Assessed
Cognitive Abilities Scale-Second Edition (CAS-2) PRO-ED	2001	Individual	A	0.3 to 3.0	No	20-30 minutes	Hand	Cognitive ability
Cognitive Abilities Test, Form 6 (CogAT-Form 6) Riverside Publishing	2001	Individual	B	K-12	No	2+ hours	Hand or Computer	Cognitive ability
Das Naglieri Cognitive Assessment System (CAS) Riverside Publishing	1997	Individual	B	5-17	Yes	40-60 minutes	Hand or Computer	Intelligence: planning, attention, simultaneous, and successive
Detroit Tests of Learning Aptitude – Primary: Third Edition (DTLA-P:3) PRO-ED	1991	Individual	A	3-9	No	15-45 minutes	Hand	Cognitive ability, language, attention, and motor abilities
Differential Ability Scales (DAS) PsychCorp	1990	Individual	C	2-17	No	45-65 minutes	Hand or Computer	General conceptual ability, literacy numeracy, cognitive intellectual functioning
Draw-A-Person Intellectual Ability Test for Children, Adolescents, and Adults (DAP:IQ) PRO-ED	2004	Group and Individual	A	4-89	No	5-10 minutes	Hand	Cognitive development

Title, Acronym, and Publisher	Date of Publication	Group or Individual Administration	Training required for administration	Age /Grade Range	Alternate Forms	Administration Time	Scoring Method	Areas Assessed
Gifted and Talented Evaluation Scales (GATES) Prufrock Press	1996	Individual	A	5-18	No	Untimed	Hand	Characteristics, skills, and talents
Gifted Evaluation Scale- Second Edition (GES-2) Hawthorne Educational Services	1998	Individual	A	5-18	No	15-20 minutes	Hand or Computer	Intellectual ability, creativity, academic aptitude, leadership ability, performing and visual arts, motivation
Gifted Rating Scales – Preschool/Kindergarten Forms (GRS-P) PsychCorp	2003	Individual	B	4-6	No	5-10 minutes	Hand	Intellectual ability, academic ability, motivation, creativity, and artistic talent
Kaufman Assessment Battery for Children, Second Edition (KABC-II) American Guidance Services	2004	Individual	B	3-18	No	25-70 minutes	Hand or Computer	Mental processing, fluid/crystallized intelligence, nonverbal intelligence
Kaufman Brief Intelligence Test, Second Edition (KBIT-2) American Guidance Services	2004	Individual	B	4-90	No	20 minutes	Hand	Verbal and nonverbal intelligence
Kaufman Survey of Early Academic and Language Skills (K-SEALS) American Guidance Service	1993	Individual	B	3-6	No	15-25 minutes	Hand	Expressive and receptive language skills, pre-academic skills, articulation

Title, Acronym, and Publisher	Date of Publication	Group or Individual Administration	Training required for administration	Age /Grade Range	Alternate Forms	Administration Time	Scoring Method	Areas Assessed
Leiter International Performance Scale-Revised (Leiter-R) Stoelting Co.	1997	Individual	B	2-20	No	90 minutes	Hand or Computer	Nonverbal cognitive ability
Naglieri Nonverbal Ability Test (NNAT) The Psychological Corporation	2003	Individual	B	5-17	Yes	25-30 minutes	Hand	Nonverbal intelligence
Otis Lennon School Ability Test 8th Edition (OLSAT 8th Edition) Harcourt Brace Educational Measurement	2004	Group	A	K-12	Yes	Up to 75 minutes	Hand or Machine	Verbal and nonverbal intelligence
Peabody Individual Achievement Test-Revised Normative Update (PIAT-R/NU) American Guidance Service	1998	Individual	B	5-18	No	60 minutes	Hand or Computer	Scholastic achievement in reading, spelling, mathematics, and writing
Peabody Picture Vocabulary Test- Third Edition (PPVT-III) American Guidance Service	1997	Individual	B	2-90	Yes	10-15 minutes	Hand or Computer	Verbal ability
Pictorial Test of Intelligence-Second Edition (PTI-2) PRO-ED	2001	Individual	A	3-8	No	15-30 minutes	Hand	Verbal abstractions, form discrimination, and quantitative concepts

Title, Acronym, and Publisher	Date of Publication	Group or Individual Administration	Training required for administration	Age /Grade Range	Alternate Forms	Administration Time	Scoring Method	Areas Assessed
Raven's Progressive Matrices Oxford Psychologists Press, Ltd. PsychCorp	1998	Group and Individual	B	5-11	Yes	15-30 minutes	Hand	Nonverbal cognition and intelligence
Reynolds Intellectual Assessment Scales (RIAS) Psychological Assessment Resources, Inc.	2003	Individual	C	3-94	No	20-25 minutes	Hand	Verbal and nonverbal ability
Scales for Identifying Gifted Students (SIGS) Prufrock Press	2004	Individual	A	5-18	No	35-70 minutes	Hand	Intellectual ability, creativity, and leadership
Screening Assessment for Gifted Elementary Students 2nd Edition (SAGES-2) Prufrock Press	2001	Individual or Group	A	5-14	No	1.5 to 2.25 hours	Hand	Aptitude and achievement
Slosson Intelligence Test-Primary (SIT-P) Slosson Educational Publications, Inc.	1999	Individual	A	2-7	No	10-25 minutes	Hand	Verbal, performance, and cognitive ability
Slosson Intelligence Test, Revised (SIT-R3) Slosson Educational Publications, Inc.	2002	Individual	A	4-65	No	10-20 minutes	Hand or Computer	Information processing, comprehension, quantitative ability, similarities and differences, vocabulary, and auditory memory

Title, Acronym, and Publisher	Date of Publication	Group or Individual Administration	Training required for administration	Age /Grade Range	Alternate Forms	Administration Time	Scoring Method	Areas Assessed
Stanford-Binet Intelligence Scale, Fifth Edition (SB5) Riverside Publishing	2003	Individual	C	2-85	No	Not reported	Hand, Computer, or Scoring Service	Verbal and nonverbal intelligence
Test for Creative Thinking-Drawing Production (TCP-DP) Swets Test Publishers [The Netherlands] PsychCorp	1996	Group and Individual	B	5-95	Yes	30 minutes	Hand	Creative potential
Test of Early Mathematics Ability-Third Edition (TEMA-3) PRO-ED	2003	Individual	A	3-8	Yes	40 minutes	Hand	Formal and informal mathematical skills
Test of Early Reading Ability – Third Edition (TERA-3) PRO-ED	2001	Individual	A	3-8	Yes	30 minutes	Hand	Emergent literacy
Test of Early Written Language-2nd Edition (TEWL-2) PRO-ED	1996	Individual	A	3-10	Yes	30-45 minutes	Hand	Early writing ability
Test of Mathematical Abilities for Gifted Students (TOMAGS) PRO-ED	1998	Group and Individual	A	K-6	No	30-60 minutes	Hand	Mathematics ability

Title, Acronym, and Publisher	Date of Publication	Group or Individual Administration	Training required for administration	Age /Grade Range	Alternate Forms	Administration Time	Scoring Method	Areas Assessed
Tests of Memory and Learning (TOMAL) PRO-ED	1994	Individual	A	5-19	No	45 minutes	Hand	Verbal memory, nonverbal memory, delayed recall, and composite memory
Universal Nonverbal Intelligence Test (UNIT) Riverside Publishing	1998	Individual	B	5-17	Yes	10-45 minutes	Hand or Computer	Cognitive ability: memory and reasoning
Wechsler Preschool and Primary Scale of Intelligence-Third Edition (WPPSI-III)	2002	Individual	C	2.6-7.3	No	30-60 minutes	Hand or Computer	Fluid reasoning ability
Wide Range Intelligence Test (WRIT) Wide Range Inc.	2000	Individual	A	4-85	No	30 minutes or less	Hand	General, verbal, and visual intelligence
Wide Range Achievement Test 3 (WRAT3) Wide Range Inc.	1993	Group and Individual	A	5-75	Yes	15-30 minutes	Hand or Computer	Reading, spelling, and arithmetic
Woodcock-Johnson III Test of Achievement (WJIII) Riverside Publishing	2001	Individual	A	2-90	Yes	55-65 minutes	Computer	Scholastic aptitude, oral language, and academic achievement
Woodcock-Johnson III Test of Cognitive Abilities (WJIII) Riverside Publishing	2001	Individual	B	2-90	Yes	35-45 minutes	Computer	Intellectual ability and cognitive ability

Using the Draw-A-Person Intellectually Ability Test with Young Children

Evidence from the review of early childhood and gifted education literature highlighting the positives of identifying and serving potentially gifted preschoolers prompted researchers to locate and field test an instrument to screen for intellectual giftedness in young children. The aim was to find a tool that would be both developmentally appropriate for young children and easy to administer and score. The Draw-A-Person Intellectual Ability Test (DAP:IQ; Reynolds & Hickman, 2004) proved to be a promising assessment because it utilizes a natural and common activity among young children, i.e., drawing, to assess intellectual development. Further, the instrument can be administered in small groups and generally requires no more than 15 minutes to both administer and score.

Method

Participants

In the fall of 2004, a research team from the Frances A. Karnes Center for Gifted Studies identified four early education programs in a rural southern state in which to field test the DAP:IQ as a screener for giftedness in young children. The four programs represented a variety of early learning situations. Program I, a university-based laboratory child development center, provided child care and a child-centered curriculum for infants and children ages six weeks to five years old. The center also held the distinction of being accredited by the National Association for the Education of Young Children and served a variety of racial groups from across the university and surrounding community. Thirteen four- and five-year olds were assessed at the Program I site. Ethnicity of the testing group included Caucasians (n=6), African Americans (n=5), and Asian Americans (n=2).

Program II was a federally funded Head Start center located in the same municipality as Program I and primarily served African-American children between the ages of three and five years old. Of the 22 four- and five-year-olds assessed at the Program II site, all were African-Americans. Program III was a public school kindergarten classroom in a rural community serving five- and six-year-old students. Sixteen children were assessed. Of those, a majority was African-American (n=13) followed by Caucasian (n=2) and Asian (n=1). Program IV, located on a Native American Indian Reservation (Choctaw), was a grouping of three pre-kindergarten classrooms at three schools in the Tribal School System. Thirty-four children between the ages of four and six years old were assessed. All were Native American except one who was Caucasian.

Materials

The Draw-A-Person Intellectual Ability Test (DAP:IQ; Reynolds & Hickman, 2004) was used as a screening instrument in the study. This brief cognitive abilities test is based on the concept that intelligence or mental maturity can be predicted from the number of developmental items included in an individual's drawing of the human figure.

Scoring

Prior to administering and scoring the assessments, the researchers, which included the project coordinator and two doctoral-level research assistants, studied the DAP:IQ manual and scoring guide. Each researcher scored the 18 sample drawings in the manual and compared individual results with the manual's scoring examples. Where subjective scoring discrepancies were encountered among the raters, a thorough review of

the manual's scoring guide for each figure was made in order to understand the discrepancies and reach consensus.

Procedure

For each of the four participating programs, researchers worked with school administrators to design a schedule for conducting assessments. Two researchers visited each program and administered the DAP:IQ to small groups of five to seven children. Each DAP:IQ protocol was scored by all three researchers. The early intensive and collaborative work done to ensure mastery by the research team of the scoring criteria resulted in a low number of scoring discrepancies between the raters. When differences did occur, raters revisited the scoring models provided in the manual for assistance and resolution. The names of students who scored at or above the 85th percentile on the DAP:IQ were reported to their respective program administrators for further assessment to determine giftedness.

Results

Student scores on the DAP:IQ were analyzed based on raw score, scaled score or IQ equivalent, and percentile rank for school, ethnicity, and gender. The descriptive statistics for the raw scores, IQ, and percentile scores on the instrument by program testing site, ethnicity, and gender are reported in Tables 1, 2, and 3 respectively. The students' scores indicate that the DAP:IQ identified high cognitive ability (above the 85th percentile) in the young children assessed at each program testing site and for each ethnic and gender group. Of the 85 students assessed, 11 percent of these obtained scores that would indicate high cognitive ability.

One-way analyses of variance (ANOVA) were conducted to determine if any significant differences in the children's scores were present due to the program attended, student ethnicity or gender. The results of the ANOVAs revealed that a significant difference occurred in only one instance, raw score and program attended. In every other case no significant difference could be determined between raw score, IQ, or percentile scores and student program, ethnicity, or gender.

Table 4 reports the result of a one-way analysis of variance that was conducted to evaluate the relationship between program attended and raw, IQ, and percentile scores on the DAP:IQ. The independent variable, program, included four early childhood program settings (see participants section). The dependent variables were the DAP:IQ scores. The IQ and percentile scores were not significant based on program attended, $F(3, 81) = 1.80$, $p = .15$ and $F(3, 81) = 1.92$, $p = .13$ respectively. However, a significant relationship was found between the DAP:IQ raw score and program attended , $F(3, 81) = 8.01$, $p < .01$. Based on the age of the students at one of the program testing sites (five- and six-year-olds), a significant difference on this particular variable was expected.

The ANOVA conducted to determine the relationship between the independent variable of ethnicity and the dependent variables of raw, IQ, and percentile scores are found in Table 5. No significant differences were found based on student ethnicity for raw score, $F(3, 81) = 2.45$, $p = .06$, IQ, $F(3, 81) = 1.57$, $p = .20$, or percentile score, $F(3, 81) = 1.56$, $p = .21$. Because of the diversity of the children assessed, the lack of significance between groups on either of the dependent variables was encouraging.

The one-way analysis of variance for the third independent variable, gender, is reported in Table 6. As in the other two procedures, the dependent variables were raw,

IQ, and percentile scores. These results show no significant relationship between the raw scores obtained by the children and their gender $F(3, 83) = 2.80$, $p = .10$. Similar results were found for IQ, $F(3, 83) = 3.21$, $p = .08$, and percentile scores, $F(3, 83) = 3.62$, $p = .06$.

Discussion

The primary purpose of the research conducted was to locate an assessment instrument that would identify potential giftedness in young children. Because of the percentage of children who scored at the 85th percentile or above on the instrument, it may be concluded that, indeed, the DAP:IQ does identify potential giftedness in young children. Considering the ethnic diversity of the participants in the study and the lack of significant differences found across ethnicities, a further conclusion may be that the DAP:IQ helps to reduce or even eliminate cultural bias.

Gifted education regulations in the state where the study was conducted require students to score in the 90th percentile on a test of cognitive ability for identification as intellectually gifted. A provision allows disadvantaged students to be placed in a program with a score in the 85th percentile on an intelligence test providing they also score within the 90th percentile on a standardized achievement test. Results of the current study are encouraging that the DAP:IQ is an assessment that can be administered to preschool children in a variety of early childhood settings to give educators a general estimate of cognitive ability in the children they serve. This information can be used to guide early childhood teachers in planning appropriate curriculum goals and options to help high-ability preschoolers reach their potential.

Table 1

Descriptive Statistics by School Program

						95% Confidence Interval for Mean			
		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Raw Score	Program I	13	7.0000	2.16025	.59914	5.6946	8.3054	4.00	11.00
	Program II	22	8.6364	3.88582	.82846	6.9135	10.3592	3.00	20.00
	Program III	16	11.8125	3.86814	.96703	9.7513	13.8737	6.00	20.00
	Program IV	34	7.4706	2.51342	.43105	6.5936	8.3476	4.00	15.00
	Total	85	8.5176	3.53086	.38298	7.7561	9.2792	3.00	20.00
IQ	Program I	13	98.7692	9.08436	2.51955	93.2796	104.2589	86.00	118.00
	Program II	22	104.0000	13.90786	2.96517	97.8336	110.1664	77.00	126.00
	Program III	16	104.4375	9.99979	2.49995	99.1090	109.7660	84.00	122.00
	Program IV	34	98.1176	11.64829	1.99767	94.0534	102.1819	75.00	123.00
	Total	85	100.9294	11.83396	1.28357	98.3769	103.4819	75.00	126.00
Percentile	Program I	13	47.0000	21.12660	5.85947	34.2333	59.7667	18.00	89.00
	Program II	22	59.0455	28.86995	6.15509	46.2452	71.8457	6.00	96.00
	Program III	16	60.1250	22.08431	5.52108	48.3571	71.8929	14.00	93.00
	Program IV	34	46.1765	24.97450	4.28309	37.4625	54.8905	5.00	94.00
	Total	85	52.2588	25.44329	2.75971	46.7708	57.7468	5.00	96.00

Table 2

Descriptive Statistics for Ethnicity

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Raw Score	Caucasian	9	8.7778	3.38296	1.12765	6.1774	11.3782	5.00	15.00
	Asian	3	11.6667	7.37111	4.25572	-6.6442	29.9775	6.00	20.00
	African-American	41	9.1220	3.75630	.58663	7.9363	10.3076	3.00	20.00
	Native American	32	7.3750	2.51126	.44393	6.4696	8.2804	4.00	15.00
	Total	85	8.5176	3.53086	.38298	7.7561	9.2792	3.00	20.00
IQ	Caucasian	9	101.6667	8.74643	2.91548	94.9436	108.3898	92.00	118.00
	Asian	3	106.0000	12.28821	7.09460	75.4744	136.5256	97.00	120.00
	African-American	41	103.0732	12.38223	1.93378	99.1649	106.9815	77.00	126.00
	Native American	32	97.5000	11.45820	2.02554	93.3689	101.6311	75.00	123.00
	Total	85	100.9294	11.83396	1.28357	98.3769	103.4819	75.00	126.00
Percentile	Caucasian	9	53.6667	20.67607	6.89202	37.7736	69.5597	30.00	89.00
	Asian	3	62.0000	25.70992	14.84363	-1.8670	125.8670	42.00	91.00
	African-American	41	57.0000	26.44523	4.13005	48.6529	65.3471	6.00	96.00
	Native American	32	44.8750	24.55639	4.34100	36.0215	53.7285	5.00	94.00
	Total	85	52.2588	25.44329	2.75971	46.7708	57.7468	5.00	96.00

Table 3

Descriptive Statistics for Gender

						95% Confidence Interval for Mean			
		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Raw Score	Female	49	9.0612	3.93916	.56274	7.9298	10.1927	3.00	20.00
	Male	36	7.7778	2.76830	.46138	6.8411	8.7144	3.00	15.00
	Total	85	8.5176	3.53086	.38298	7.7561	9.2792	3.00	20.00
IQ	Female	49	102.8776	12.93354	1.84765	99.1626	106.5925	75.00	126.00
	Male	36	98.2778	9.70305	1.61718	94.9947	101.5608	77.00	122.00
	Total	85	100.9294	11.83396	1.28357	98.3769	103.4819	75.00	126.00
Percentile	Female	49	56.6939	27.19314	3.88473	48.8831	64.5047	5.00	96.00
	Male	36	46.2222	21.78349	3.63058	38.8517	53.5927	6.00	93.00
	Total	85	52.2588	25.44329	2.75971	46.7708	57.7468	5.00	96.00

Table 4

Analysis of Variance for School Program

		Sum of Squares	df	Mean Square	F	Sig.
Raw Score	Between Groups	241.225	3	80.408	8.081	.000
	Within Groups	805.999	81	9.951		
	Total	1047.224	84			
IQ	Between Groups	733.802	3	244.601	1.796	.154
	Within Groups	11029.775	81	136.170		
	Total	11763.576	84			
Percentile	Between Groups	3620.660	3	1206.887	1.926	.132
	Within Groups	50757.646	81	626.638		
	Total	54378.306	84			

Table 5

Analysis of Variance for Ethnicity

		Sum of Squares	df	Mean Square	F	Sig.
Raw Score	Between Groups	87.111	3	29.037	2.450	.069
	Within Groups	960.112	81	11.853		
	Total	1047.224	84			
IQ	Between Groups	646.796	3	215.599	1.571	.203
	Within Groups	11116.780	81	137.244		
	Total	11763.576	84			
Percentile	Between Groups	2968.806	3	989.602	1.559	.206
	Within Groups	51409.500	81	634.685		
	Total	54378.306	84			

Table 6

Analysis of Variance for Gender

		Sum of Squares	df	Mean Square	F	Sig.
Raw Score	Between Groups	34.185	1	34.185	2.801	.098
	Within Groups	1013.039	83	12.205		
	Total	1047.224	84			
IQ	Between Groups	439.089	1	439.089	3.218	.076
	Within Groups	11324.488	83	136.440		
	Total	11763.576	84			
Percentile	Between Groups	2275.675	1	2275.675	3.625	.060
	Within Groups	52102.630	83	627.743		
	Total	54378.306	84			

Serving the Preschool Gifted Child

The instruction of young gifted children must be rooted in an understanding of learning characteristics and developmentally appropriate assessment practices. The intersection of these concepts has strong implications for serving gifted preschoolers and is influenced by the assimilation of the fields of early childhood and gifted education (Barbour, 1992; Barbour & Shaklee, 1998; Hodge & Kemp, 2000; Snowden, 1995; Walker, Hafenstein, & Crow-Enslow, 1999). Snowden (1995) extends this concept by stating that the education for young gifted children should also draw from the experiential learning base offered by the field of special education. Barbour (1992) has identified several areas of collaboration between these fields: early intervention, integrated curriculum, evaluation, and parental involvement. In order to understand the progress of each of these areas, it is helpful to examine the development of preschool gifted education programs.

Preschool Programs for Young Gifted Children

The Astor Program

Virginia Ehrlich led the way in education for the young gifted child with the Astor Program for Gifted Children in 1973. While the Astor Program was intended as a source of research in the field of gifted education, it also served as a model school for intellectually gifted children aged four and above (Ehrlich, 1978). Erhlich's work was groundbreaking in the early identification of children in a public school system. Children were selected for participation based on extensive multifactored screening criteria that included intelligence test scores. The differentiated curriculum was designed to provide flexibility to meet the learning needs of young gifted children. A developmentally

appropriate classroom management model was also established.

Although the program began with a grant from the Astor Foundation, a primary project goal was institutionalization. The Astor program was successfully transitioned from private funding to inclusion in the New York City public schools. It later expanded to serve children in grades K-6, growing from two classes in 1974 to forty classes in 1978 (Ehrlich, 1979). Subsequent studies of the Astor program graduates showed gains in both the affective and cognitive domains (Ehrlich, 1978; 1979; 1984).

University of Illinois

An early investigation by Karnes and Johnson (1991) indicated that between the years of 1979 and 1982 the number of gifted programs for preschool age children rose only slightly from five to eighteen nationwide. Five barriers to initiating program development for preschoolers were identified: lack of parental advocacy, lack of appropriate teacher training, emphasis on older students in gifted education, financial constraints, and legal roadblocks. Despite these barriers, Karnes developed three programs for gifted preschoolers at the University of Illinois. The three programs were established in order to meet the needs of various groups within the gifted population and focused on slightly different methods for learning based on the needs of the students, parents, and teachers in each group. The programs were University Primary School (UPS), serving children from middle to upper-income homes; the Retrieval and Acceleration of Promising Young Handicapped Talented (RAPYHT), serving disabled gifted preschoolers; and Bring Out Head Start Talents (BOHST), serving children from low-income families who participated in Head Start programs. Preschoolers participating in the BOHST and RAPYHT programs experienced structured enrichment opportunities

in order to facilitate the development of thinking skills and creativity, whereas, children in the UPS program who typically already exhibited these skills experienced instruction focused on exploration of individual topics of interest. Assessment tools included teacher questionnaires and the use of a formal assessment instrument unique to the needs of each group.

While the three groups at the University of Illinois were designed to meet the needs of various socioeconomic populations, Barclay and Benelli (1994) cautioned against using socioeconomic status alone to determine curriculum. They evaluated the three programs that Karnes developed as well as a state-funded preschool program for at-risk children, some of whom were from disadvantaged homes. The study indicated that the students at the state-supported school, most of whom were from lower-income families, showed evidence of the higher order thinking skills that were not typical of the children in Karnes' original work. From these observations, Barclay and Benelli (1994) deducted that the socioeconomic labels placed on the children in the UPS, RAPYHT, and BOHST programs may have unnecessarily hampered the development of the children from lower socioeconomic strata. It should be noted, however, the BOHST program was designed to fit within existing Head Start programs that target children from a lower socioeconomic strata. Due to this collaboration, the stigma that Barclay and Benelli describe may not be a result of the BOHST curriculum alone. According to the National Institute for Early Education Research (2003), many Head Start teachers have neither a baccalaureate nor an associate degree. Therefore, the discrepancies noted by Barclay and Benelli may reflect teachers who lack adequate training concerning the characteristics and needs of gifted children or other problems unrelated to the original curriculum

(Karnes & Johnson, 1991). Based on the observed teaching strategies at the state-supported school, Barclay and Benelli (1994) recommend that all students, regardless of socioeconomic status, can benefit from instruction that focuses on teaching through mediating strategies, including facilitation, support, and scaffolding of prior learning. They caution program designers to be wary of placing socioeconomic labels on their students for instructional purposes and state, "We want to avoid the adverse consequences of assuming that these children arrive at school with cognitive, experiential and linguistic deficits thought to derive from their family and community situations" (p. 135). This echoes the concerns of Karnes and Johnson (1991) for the BOHST program, "having teachers focus on identifying the strengths of children and then programming for those strengths may improve the teacher's attitude toward these children" (p. 279).

The Hollingworth School

Another model program for gifted preschoolers is the Hollingworth School, located at Teachers College, Columbia University, New York. The Hollingworth School strives to combine the individual intellectual needs of the children with a setting that is appropriately nurturing for young children. The school is founded on the "belief that such children do not have their needs met in a traditional nursery school program" (Wright & Coulianos, 1991). The school is designed to meet the children's needs and foster growth in five areas: participation in a safe environment, knowledge of their world, critical thinking and problem solving, social skills, and physical development. Children are selected for participation based on detailed parent interviews, in-class observations of the child's activities and abilities, and the results of either the Stanford Binet form L-M or Stanford Binet IV. Although there are no required scores, the children who are selected

are those who show evidence of being able to benefit most from the program.

The Quest Academy

The Quest Academy in Palatine, Illinois, is a private school for gifted and talented students, including a preschool for three-year-olds and a prekindergarten for four-year-olds. The program seeks to meet the needs of these students with respect for the individuality of the child. The desired outcome is for gifted and talented youngsters to experience the joy of learning. Students are admitted to the program based on teacher and parent nominations as well as an informal classroom observation (Quest Academy, 2004).

University Child Development School

An emphasis on social skills is found at the University Child Development School, a private elementary school for children ages three through fifth grade, which grew out of the Child Development Preschool at the University of Washington in Seattle. Preschool children are admitted to the program on the basis of student visits, teacher recommendations, parent questionnaires, and parent interviews. Children are guided toward independence, assertiveness, social sensitivity, friendship, and problem solving through teacher guidance in a variety of role-play situations. Preschoolers are also involved in small group instruction of language arts, reading, science, math, art, and creative movement. Effort is made to match activities to the skill and competence levels of the children in the program (Roedell, Jackson, & Robinson, 1980).

Characteristics of Effective Programming

In examining these historical and existing programs, several similarities are evident. These programs create a balance between child-centered/directed and teacher-

selected/directed activities (Barclay and Benelli, 1994; Hertzog & Fowler, 1999; Walker, Hafenstein, & Crow-Enslow, 1999; Wright & Coulianos, 1991). This type of structure is based on the following understandings: learning is developmentally oriented; learning is acting on the environment; learning is based on dialogue; learning is making decisions; learning is integrating knowledge (Karnes, Shwedel, & Kemp, 1985). Based on these concepts, appropriate programming for gifted preschool children can be designed around the three elements of integrated curriculum, ongoing evaluation, and parental involvement.

Integrated Curriculum

The balance previously mentioned between child-centered/directed and teacher-selected/directed activities can also be seen as the need to balance the curriculum with equal amounts of both academic activities and play (Parke & Ness, 1988).

The importance of providing appropriate programming is especially apparent when one considers the needs and the patterns of development of the young gifted child. Rather than focusing on acceleration, most programs aim to increase cognitive strategies, arouse curiosity, and present unique problems to solve (Robinson, 1993). Developmentally appropriate practice for the preschool gifted child must address both asynchronous development of young gifted children as well as the child's emerging skills (Morelock & Morrison, 1999). Therefore, at the same time that complex and sophisticated concepts should be provided to meet the child's advanced thought processes, sensitivity is also required regarding possible limitations in social, emotional, or physical domains. Some projects may cause extreme frustration in young gifted children if their uneven development is not considered (Robinson 1993; Roedell et al.,

1980). "Development advances when children have opportunities to practice newly acquired skills as well as when they experience a challenge just beyond their present level of mastery" (Bredekamp & Copple, 1997, p.14).

Young gifted children should be involved in the process of determining instructional content because curriculum should be drawn from their interests (Parke & Ness, 1988). Basing the curriculum on children's interests will also help them take responsibility for their education and set the stage for continued growth and learning. An example of preschool curriculum based on student input is the Reggio Emilia approach developed in Italy by Louis Malaguzzi (Barbour & Shaklee, 1998). This program is referred to as an "emergent curriculum" (p.233) because teachers observe their students to find out what their precise needs and interests are to plan future activities. Barbour and Shaklee (1998) present it as a viable alternative to present programs for young gifted children.

The Reggio Emilia approach is based on six principles:

1) Careful preparation of the learning environment to meet learner needs is essential.
2) Focus should be placed on the relationships between parents, teachers, and children.
3) Education should be viewed as an active process.
4) Teachers must define, reflect on and redefine their philosophies of teaching.
5) Curriculum must be child-centered and focused on children's rights.
6) The concept of emergent curriculum is key.

In conclusion, it is not enough to simply provide young gifted children with

advanced academic offerings; curriculum must be differentiated (Karnes, Shwedel, & Kemp, 1985). Maker's (1986) framework for gifted preschool curricula may help to organize the different curriculum strategies and concerns that are mentioned by several authors. Maker recommends four dimensions of curriculum: differentiated content, process skill development, product development, and learning environment to guide the strategies in the classroom for young gifted children. A sampling of curriculum strategies and selected Internet resources is located on page 127 of this manual.

Differentiated Content

The use of broad-based topics and problems will also allow for deep exploration of academic and interest areas (Kaplan, 1980; Vydra & Leimbach, 1998). For preschool-aged children, content should come from several domains, including aesthetic, affective, cognitive, language, physical, and social (Kostelnik, Soderman, & Whiren, 2004). For the gifted preschooler, it is possible to differentiate the content in each of these areas. Teachers should not shy away from presenting the complex or abstract underlying themes that are unique to disciplines or fields of study (Baum, 1987). For example, isolated topics such as money or temperature, typically covered in kindergarten and first grade math curriculum, are usually taught by asking the students to identify coins and read a thermometer. A curricular unit for gifted preschoolers in mathematics may center on the broader concept of decimals. When a broader principle is explored with young gifted children, their learning transfers to several areas and children understand the connection between concepts (Vydra & Leimbach, 1998). The interrelationship of ideas is further enhanced by using problem solving, analogical reasoning, pictures used in an analogy format, and other activities that promote inquiry (Caropreso, 1994; Kitano, 1982;

Koopmans-Dayton & Feldhusen, 1987). Young gifted children may also be able to handle sophisticated cognitive skills such as those required to apply complex spatial concepts of math and geometry (Lempers, Block, Scott, & Draper, 1987).

The scientific process, including the steps of hypothesis and experimentation, is particularly well suited as a theme for preschool gifted children. Plowman (1987) suggests that preschool gifted students investigate the parallel themes of humans and their environments and animals and their habitats. A child's physical world offers a wealth of topics to explore, including images and everyday materials in their own homes and neighborhoods (Maker, 1986; Plowman, 1987).

Curriculum for the gifted should also address the affective domain to promote healthy self-concept and self-esteem. Teachers of the young gifted need to teach empathy (Abroms, 1982). Cognitive skills such as perspective taking may be enhanced by reading and discussing books with the children about feelings and using puppetry or other creative role-playing activities (Abroms & Gollin, 1980; Lempers et al., 1987). This will help with interpreting the behavior and feelings of self and others (Karnes, 1983). Young gifted children need to learn about individual diversity in part to help them understand their own differences (Vydra & Leimbach, 1998). They also need to acquire effective interpersonal skills in order to cope with peers of differing abilities. Gifted curriculum at the preschool level includes an emphasis on play and learning within a social context. Gifted children should be given the opportunity to interact with other gifted children of the same age, even if students must be transported to another facility (Karnes, 1983).

Process Skill Development

A curriculum based on developmental characteristics and individualized instruction should provide activities that enhance cognitive abilities and higher-order thinking skills such as analysis, synthesis, and evaluation (Kitano, 1982). Teachers and parents tend to set high expectations for gifted learners and usually think of curriculum for gifted children as needing to be advanced. Yet play is an important instructional strategy for the young gifted child and can be incorporated into all kinds of educational objectives (Kaplan, 1980). Several authors agree that curriculum for gifted preschoolers should be designed to encourage exploration through dramatic play, expressive art, and block play (Kitano, 1982; Koopmans-Dayton & Feldhusen, 1987; Parke & Ness, 1988; Snowden, 1995; Vydra & Leimbach, 1998). Motor development is encouraged by block play. Blocks may be manipulated as a solitary activity, but children also construct and build with blocks parallel to each other and in groups. Pro-social behaviors are certainly enhanced when children play together (Karnes, 1983; Kitano, 1982). Play may also be used as a vehicle for teaching advanced content, learning higher-level thinking processes, and as a means for developing creative and varied products (Kaplan, 1980).

A differentiated curriculum for young gifted students must also include creative thinking activities (Karnes, 1983; Kitano, 1982). Gifted preschoolers should be encouraged to brainstorm out loud, write without editing, and use drawings to process ideas and plan projects. Creative thinking may be used as a means to solve problems in the preschool curriculum. Open-ended visual art, writing, or musical projects should be included and used to encourage fluency, flexibility, originality, and elaboration. It is important to note that curriculum driven by the children's interests should result in highly

individualized instruction. Individualized instruction is most successful when a common set of procedures for setting goals, monitoring progress, establishing deadlines, and maintaining order in the work space is used. While each child explores their interests and makes choices about their learning, caregivers need to encourage task persistence and help the children stay organized (Karnes, 1983).

Product Development

Products play an important role in learning for young children. Not only do products give children a sense of ownership in the learning process, they provide a physical tool for the child to self-evaluate his or her progress. Gifted students in the preschool classroom work on both individual and group projects resulting in a wide variety of products. Maker (1986) suggests that products need to reflect real-life applications. For example, students may create story books or a bound collection of their writings. They may dictate the story or prose to an adult and make the corresponding illustrations (Clark, 2002). Students should choose from their works those they would like to edit, rewrite, illustrate, bind, and "publish" (Vydra & Leimbach, 1998). As children begin writing books, it is important to remember that not every work must be edited and scrutinized for errors (Karnes & Stephens, 2000).

There are several ways in which students may synthesize their learning. Children's work may be scanned and placed into a PowerPoint presentation, allowing the student to choose slide design styles, create slide titles, and add text. These presentations can then be shared with other students and parents and even published to the Web. The University Primary School's Web site offers examples of preschool student's PowerPoint presentations (see page 126 for Web address). Students may also work cooperatively on

products such as a large sculpture or mural, making a representation of a habitat (environment) for an animal, or designing and setting up a new activity center.

Learning Environment

In order to facilitate the delivery of content, process, and product, there are a variety of approaches for gifted preschoolers. These structures may include ability grouping or individualized instruction (Snowden, 1995). The following concepts should guide the design of a program: student-centered; encouragement of student independence; an open, accepting environment; and high mobility (Maker 1986; Koopmans-Dayton and Feldhusen, 1987). Several authors agree that the learning environment should be natural, relaxed, and flexible (Hanninen, 1998; Koopmans-Dayton and Feldhusen, 1987; Plowman, 1987). Young gifted children respond well to multiple learning centers such as art, science, reading, writing, and building. Bright wall displays, multimedia technology, animals, and plants should also be featured in a combination of both private spaces and shared public spaces (Clark, 2002; Smutny, Walker, & Meckstroth, 1997). Young children learn from each other. Their skills will improve when they have the opportunity to exchange information with each other (Roedell et al., 1980). In both writing and art activities, a wide variety of materials such as different types of paintbrushes and paper should be provided to invite experimentation (Karnes, 1983). "Young gifted children want to experiment with colors, texture, and tones" (Vydra & Leimbach, 1998, p. 465).

Programming that provides an appropriate learning environment for young gifted children may make a difference in the emergence of exceptionality (Damiani, 1997). Therefore appropriate programming should also be nurturing to the young gifted child. A well-designed curriculum may even help develop positive attitudes toward learning that

may prevent the gifted child from becoming an underachiever (Cline & Schwartz, 1999; Karnes, 1983; Story, 1991). Problems that are associated with underachievement in gifted students include loss of interest and motivation, boredom, rebellious behavior, and social/emotional concerns. Early consideration of the needs of the gifted preschooler can help to prevent these problems and provide a firm foundation for helping these children understand their giftedness. For these reasons, attention must be given to the preschool curriculum for gifted children, as well as provisions for the evaluation of preschool gifted programs.

Ongoing Evaluation

One of the aspects of a quality preschool gifted program is systematic evaluation (Hanninen, 1998). The first step in ensuring quality is to develop a mission statement. This statement must clearly present the goals of the program so that outcomes may be measured appropriately (Hanninen, 1998). In evaluating program goals and individual student objectives, the screening measure used for entrance into the program is an important artifact. It is vital that the identification measure match the offerings of the program (Kaplan, 1980; Karnes, 1983; Koopmans-Dayton & Feldhusen, 1987; Robinson, 1993; Roedell et al., 1980). In addition to the assessment, programs for young gifted children should be evaluated using reviews of educational products and materials, inventories, observation, needs assessment, and questionnaires (Kaplan, 1980). Hertzog and Fowler (1999) developed an evaluation plan for one university-based preschool program for the gifted through analysis of stakeholders' and decision makers' issues and concerns and other sources of data, including cost-effectiveness of the program, program design, and the educational outcomes for the students. They found that external

evaluators were necessary in order to assess all aspects of the program. Comparisons groups must be used to evaluate a program in order to assess whether or not a program is really providing a special service (Robinson, 1993; Vydra & Leimbach, 1998). Other programs that either exclusively served gifted students or those that serve gifted students among normally developing peers may be used to compare assessment of educational outcomes.

Another aspect of program evaluation is staff development. The supervisor that monitors a preschool program serving gifted children should be trained in gifted education (Koopmans-Dayton & Feldhusen, 1987). The supervisor should arrange for the ongoing professional training of personnel (Koopmans-Dayton & Feldhusen, 1987; Mathews & Burns, 1992). Staff should model higher-order thinking by using open-ended questions, advanced vocabulary, and deductive and creative thinking (Hanninen, 1998). Staff members also need to work cooperatively with kindergarten and first grade teachers, as well as principals in the child's next educational setting in order to help students transition smoothly (Koopmans-Dayton & Feldhusen, 1987).

Complete and comprehensive record keeping are necessary to measure both student and program outcomes (Hanninen, 1998; Koopmans-Dayton & Feldhusen, 1987). Evaluations of student work should be collected periodically throughout the year. These documents will record events that demonstrate higher-order thinking, and they should "reflect individual differences and abilities appropriate to mental age" (Hanninen, 1998, p. 453). Such events that may be noticed and recorded are the use of advanced vocabulary, metaphors and analogies, mastery of new concepts or skills, or other demonstrations of complex mental connections (Roedell et al., 1980). Most importantly,

when staff and parents work together to establish and plan program and individual goals, progress is more easily evaluated (Hanninen, 1998; Karnes, 1983). Being involved in the process is the best way for parents to know if a program is meeting their child's needs.

Parental Involvement

There is nothing more important than parental involvement in the development of young children's gifts. From the time that a child is born until the he or she enters a school setting, the family has the primary responsibility for building skills and nurturing talent. It is helpful for parents to be knowledgeable of the many characteristics of gifted children. A parent who is aware of the emotional and social needs of the young gifted child will help their child develop physical and social skills just as carefully as they encourage mental growth (Hall & Skinner, 1980). Parents must be careful to view their child's giftedness as separate from the child. Young gifted children need to understand that they are loved for their own sake and not merely for intellectual achievements (Hall & Skinner, 1980; Sankar-DeLeeuw, 2002). Plowman (1987) encourages parents to "become an environmental specialist with your child's living space" (p. 25). This involves the use of the child's questions and expressions of interest as guides into further learning and explorations (Hall & Skinner, 1980). Children's intellectual and creative pursuits can be encouraged with the use of learning centers at home. By paying attention to the child's physical space, parents may entice him or her to discover, learn, and think.

As the child enters a preschool or kindergarten program, the family continues to play a major role. It is especially important for parents to work closely with professionals to establish good relationships and to cooperatively determine goals for the child (Karnes 1983). There is evidence to suggest that children get more out of a preschool program,

whether it is exclusively for gifted students or not, when parents and professionals work together to try to meet the needs of the child (Sankar-DeLeeuw, 2002; Vydra & Leimbach, 1998).

Serving the young gifted child begins with the recognition of their abilities and a sensitivity to their needs. While there are many different curriculum strategies, attention to the child's physical world is a primary concern. All of the strategies suggested are guided by characteristics of giftedness and developmentally appropriate practice. In order to ensure that the abilities of young gifted children are nurtured and enhanced, a partnership between family members, education professionals, and other caregivers is essential.

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At the time of publication, all of the Web addresses were current and active.

Matrix of Program Offerings for Gifted Preschoolers

Program Name	Address	Program Offerings
The Center for Gifted at National-Louis University	National-Louis University Box 364 Wilmette, IL 60091 *www.thecenterforgifted.com*	Sunday program for Pre-K and kindergarten
The Center for Gifted Education	College of William and Mary P. O. Box 8795 Williamsburg, VA 23187 *http://cfge.wm.edu/*	Saturday and Summer Enrichment programs for four- and five-year-olds
The Center for Talent Development	Northwestern University 617 Dartmouth Place Evanston, IL 60208 *www.ctd.northwestern.edu*	Saturday and Summer Enrichment programs for four- and five-year-olds
The Child Development Preschool	The Child Development Preschool University of Washington Seattle 3500 Interlake Avenue, North Seattle, WA 98103 *www.ucds.org*	Half-day and full-day preschool for three-, four- and five-year-olds
The Frances A. Karnes Center for Gifted Studies	The Frances A. Karnes Center for Gifted Studies The University of Southern Mississippi 118 College Drive # 8207 Hattiesburg, MS 39406-0001 *www.usm.edu/gifted*	Saturday program for four- and five-year-olds
Gifted Education Resource Institute (GERI)	GERI Beering Hall 100 N. University St. Purdue University West Lafayette, IN 47907-2098 *www.geri.soe.purdue.edu*	Saturday and Summer Enrichment programs for four- and five-year-olds
The Hollingworth Preschool	Teachers College, Columbia University Box 170 New York, NY 10027 *www.tc.columbia.edu/stlife/FamilyGuide/hollingworth.html*	Half-day and full-day preschool for three-, four- and five-year-olds. and summer science camp

Program Name	Address	Program Offerings
The Hunter College Elementary School	Hunter College 71 East 94th Street New York, NY 10128 *http://www.hunter.cuny.edu/gifted-ed/*	Full-day kindergarten
The Quest Academy	The Quest Academy 500 North Benton Palatine, IL 60067 *www.questacademy.org*	Half-day and full-day preschool for three- and four-year-olds
The Rainard School for Gifted Children	The Rainard School 13922 Old Katy Road Houston, TX 77079 *www.rainard.org*	Mixed-age elementary program for ages four and up
The Ricks Center for Gifted Children	The Ricks Center University of Denver 2040 South York Street Denver, CO 80208 *www.du.edu/ricks*	Full-day preschool for three-, four- and five-year-olds
The Roeper School	The Roeper School P. O. Box 329 Bloomfield, Hills, MI 48303 *www.roeper.org*	Half-day and full-day preschool for two-and-one half-, three-, and four-year-olds
The University of Louisiana at Lafayette's Center for Gifted Education	Center for Gifted Education University of Louisiana P. O. Box 43251 Lafayette, LA 70504-3251 *www.coe.louisiana.edu/centers/gifted.html*	Summer enrichment program for four- and five-year-olds
University Primary School	University Primary School Children's Research Center 51 Gerty Drive Champaign, IL 61820 *www.ed.uiuc.edu/ups*	Half-day preschool for three-, and four-year-olds and combined full-day K-1 program

Matrix of Curriculum Strategies and Selected Internet Resources

Content Strategies	Internet Resources
Junior Great Books	http://www.greatbooks.org/typ/
Whole Language Instruction	http://reading.indiana.edu/ieo/bibs/whole.html
Math Their Way	http://www.center.edu/
Strategy games	http://www.educationallearninggames.com/

Process Strategies	Internet Resources
Creative Problem Solving	http://www.fpsp.org/
Bloom's Taxonomy: Cognitive Domain	http://chiron.valdosta.edu/whuitt/col/cogsys/bloom.html
Krathwohl's Taxonomy: Affective Domain	http://classweb.gmu.edu/ndabbagh/ Resources/Resources2/krathstax.htm
Talents Unlimited	http://www.sharingsuccess.org/ code/eptw/profiles/68.html
Hilda Taba Teaching Strategies	http://imet.csus.edu/fundamentals/ inductive/taba_handbook.htm

Product Strategies	Internet Resources
Bar graphs, picture graphs, pie charts	http://illumtest.nctm.org/lessonplans/prek-2/graphs-p2/
Collaborative creations (quilts, murals, group sculptures)	http://www.lessonfactory.com/lesson.asp?lpk=69
Collections	http://kids.si.edu/collecting/
Dramatic presentations (puppet shows, skits, role playing)	http://www.childdrama.com/lessons.html
Student-made books	http://www.canby.com/hockmanchupp/ student_folder_websites.html
Power-point presentations	http://www.paducah.k12.ky.us/curriculum/PPoint/

Learning Environment & Delivery Strategies	Internet Resources
Renzulli's Schoolwide Enrichment	http://www.gifted.uconn.edu/sempage.html
Self-Directed Learner Model	http://www.longleaf.net/ggrow/SSDL/SSDLIndex.html
Structure of Intellect (SOI)	http://www.soisystems.com/
Ability grouping	http://www.nagc.org/Policy/abilgroup.htm
Early admission	http://www.hoagiesgifted.org/acceleration.htm
Individualized instruction	http://www.ctserc.org/library/bibfiles/differentiated8-7-03.pdf
Multi-age grouping	http://www.k12.hi.us/~bwoerner/ipcs/nongraded.html

(Hanninen, 1998; Snowden, 1995; Baum, 1998)