

GIFTED AND TALENTED STUDENTS ON THE AUTISM SPECTRUM: BEST PRACTICES FOR FOSTERING TALENT AND ACCOMMODATING CONCERNS

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A student can be identified as gifted and talented in a wide variety of areas, including cognitive, academic, artistic, leadership, and/or emotional. Most professionals who provide services for gifted and talented children conceptualize giftedness from a multiple-ability perspective (e.g., intellectual, creative, physical, and/or psychosocial behaviors; Awanbor, 1989), and comprehensive textbooks that discuss the identification and instructional and psychological needs of gifted students often take a similar multiple-identity approach (e.g., Colangelo & Davis, 2003). Regardless of the areas in which a student exhibits talent, the idea of being called *gifted and talented* indicates that a student stands out in some way due to his or her high abilities in that particular area. When a gifted and talented student is diagnosed with a coexisting autism spectrum disorder (ASD), it can be either a second label that further sets the student apart from his or her peers, or it can be an empowering discovery that leads to meeting the student's multidimensional needs.

Students who are diagnosed with ASD have a developmental disorder that results in severe social, communication, and/or behavioral impairments. In a two-volume handbook, Volkmar, Paul, Klin, and Cohen (2005) offered a comprehensive presentation about autism and associated disorders, including an extensive discussion that addressed the impact of recent research on the evolving diagnostic criteria. Issues related to changing diagnostic criteria are relevant to our discussion; gifted children with coexisting ASD often have been misdiagnosed due to the shifting definitions.

Although only a small minority of gifted students are considered twice-exceptional, or possessing gifts and talents and a disability (e.g., Attention Deficit/Hyperactivity Disorder [ADHD], learning disability, etc.), an even smaller portion are thought to be both gifted and talented and on the autism spectrum. For this group of students, Bashe and Kirby (2001) stated that the "most pressing problem" is that "their emotional and behavioral challenges are considered 'side effects' of being unusually bright, rather than the manifestations of a neurological disorder" (p. 364–365). This occurs even though autism is considered to have the best empirically based, cross-national set of criteria for diagnosis (Volkmar & Klin, 2005). That is, it is generally agreed upon that ASDs are developmental disorders in which difficulties with social interactions, impairments in communication, and repetitive and stereotyped patterns of behavior, interests, and activities represent underlying central nervous system dysfunctions. Although there continues to be debate over the specific criteria needed for diagnosis (Volkmar & Klin, 2000), the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (DSM-IV-TR) provides the symptom criteria that are most commonly used in the United States (American Psychiatric Association, 2000). Once a licensed psychologist or psychiatrist establishes the presence, frequency, and pervasiveness of symptoms within the diagnostic criteria, there must be evidence that the symptoms cause impairment before a diagnosis can be made. The ASDs that are most commonly referenced among the medical and psychological community are autism, Asperger's Disorder, and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS). For the purposes of this chapter, we will refer to this group of developmental disabilities under the umbrella term ASD.

COMPREHENSIVE EVALUATION— THE FIRST STEP

Evaluation of gifts and talents, as well as ASD, is a complex process and requires a comprehensive assessment that is tailored to the student's specific presenting issues. Only a comprehensive evaluation can lead to an accurate diagnosis of the student's particular impairments and academic strengths. As

well, an accurate diagnosis drives appropriate recommendations; therefore, from a psychological and educational perspective, it is critical to gather information pertaining to ability, achievement, memory, cognitive processing, fine-motor skills, social-emotional functioning, behavior, interpersonal relationships, communication skills, developmental history, and adaptive functioning. Specialized training in ASD assessment, as well as a thorough understanding of giftedness, is necessary. Although there has been extensive revision in the conceptualization of ASD (Volkmar et al., 2005), one consistent omission is the inclusion of giftedness as an important consideration when diagnosing and treating highly able students with this disorder.

Giftedness and ASD are not mutually exclusive; they can and do coexist. Although there are no data that document the prevalence of gifted and talented children with ASD, there are many clinical cases as well as classroom anecdotes of this coexistence (Lovecky, 2004; Neihart, 2000; Webb et al., 2005). Also, it has been noted (Gallagher & Gallagher, 2002) that in some individuals, symptoms of ASD can obscure giftedness, whereas, in others, giftedness can mask characteristics of ASD. These two scenarios represent missed identification of giftedness or missed diagnosis of ASD. There are other ways giftedness and/or ASD can be misdiagnosed. That is, a gifted and talented student may display some behaviors (e.g., extreme interest in facts) that are characteristic of ASD. Upon completion of a comprehensive evaluation, it may be that the behaviors of concern are better explained by giftedness rather than ASD. Generating recommendations that address the student's giftedness should improve the learning environment for the student and "normalize" the problematic behaviors. Attributing characteristics typically associated with autism (e.g., socialization difficulties) to giftedness (e.g., a child demonstrates socialization problems because he or she does not have intellectual peers) is equally unfortunate because the student is not receiving appropriate interventions to address the disability.

FINDINGS FROM THE JAVITS-FUNDED IOWA TWICE-EXCEPTIONAL PROJECT

The Connie Belin and Jacqueline N. Blank International Center for Gifted Education and Talent Development (B-BC), located at The University of Iowa, is a comprehensive center serving gifted and talented students and their parents and teachers. An important part of the B-BC is its comprehensive assessment and counseling clinic (ACC), which is headed by Dr. Foley Nicpon. Since its inception, gifted students with ASD have been evaluated at the ACC, and interest in developing an expertise in this area has grown to

match the increasing referrals. Dr. Amend, a psychologist in private practice, and Dr. Schuler, a clinician in private practice, report a similar phenomenon.

The increase in referrals motivated Drs. Assouline and Foley Nicpon to apply for a Jacob K. Javits Gifted and Talented Students Education Program grant to better serve this unique population. In 2005, the B-BC, in partnership with the Iowa Department of Education, was awarded one of 14 Javits federal grants: The Iowa Twice-Exceptional Project. Projects funded through the U.S. Department of Education Javits program typically are designed to enhance the education of underserved populations; therefore, receiving funding for the 3-year project validated the developing awareness that twice-exceptional students are indeed underserved in today's academic setting. One component of the Iowa Twice-Exceptional Project focuses on identification issues related to a very unique group of twice-exceptional students: gifted and talented students with ASD. The project's primary objective was to build and enhance the ability of elementary and secondary educators to meet the special education needs of these twice-exceptional students. The project's goals for educators included (a) increasing awareness and understanding of the prevalence of twice-exceptional students, (b) enhancing knowledge of effective systems to comprehensively evaluate twice-exceptional students, (c) improving attitudes about providing appropriate interventions for twice-exceptional students, and (d) changing behavior, as demonstrated by educators applying new knowledge, attitudes, awareness, and skills as they implement more appropriate procedures and interventions for gifted and talented students with ASD.

This is the only known Javits-funded project that uses a clinical perspective to develop research-based educational recommendations for working with twice-exceptional students. It also is groundbreaking in that it is the first to employ empirical methods to specifically identify issues related to the evaluation of gifted and talented students with ASD. Although a tremendous amount of information has been gained through previous case studies that describe these students (see examples listed previously), the need for empirically based assessment and treatment methods remains unfilled. A thorough literature search revealed few studies within the last two decades that have assumed this approach (Barnhill, Hagiwara, Myles, & Simpson, 2000; Piven, Harper, Palmer, & Arndt, 1996).

Preliminary Results

In this chapter, we report preliminary results from comprehensive assessments of the initial group of 18 gifted and talented students with co-occurring ASD. Our sample originally included 19 students who were referred by their parents because of a possible ASD diagnosis. Of these, 18 (16 boys and 2 girls) were diagnosed with ASD in our clinic; one received a diagnosis of ADHD.

Of the 18 students with ASD, 14 were in elementary school, two in middle school, and two in high school; their ages ranged from 6–17. Fifteen identified as White, one as Hispanic, and two did not report race/ethnicity. Nine had participated in gifted and talented services; however, only one identified as having been accelerated (whole grade).

As previously stated, a comprehensive evaluation is required for accurate diagnosis of both gifts and disabilities. Therefore, all 19 participants were administered a battery of tests that were designed to identify areas of academic and cognitive strength, and social-emotional needs, as well as confirm or rule out a diagnosis of ASD.

Cognitive Ability Assessment. The Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV; Wechsler, 2003) was administered to participants to obtain a measure of general intelligence. Scores on the WISC-IV can be reported in multiple ways, including as Index Scores (Verbal Comprehension, Perceptual Reasoning, Processing Speed, and Working Memory); as a Full Scale score (FSIQ), which is derived from the 10 core subtests that comprise the four indices; or as a General Ability Index (GAI), which is derived from the three verbally based Verbal Comprehension Index (VCI) subtests and the three nonverbally based Perceptual Reasoning Index (PRI) subtests. The GAI allows the psychologist to estimate the child's general level of ability without the effects of working memory or processing speed on performance and is used in place of the FSIQ when it is determined to be the best summary of the student's overall intelligence. In light of evidence that gifted and talented students with and without a coexisting disability commonly score lower on the WISC-IV working memory and processing speed tasks than they do on verbal and nonverbal reasoning tasks (Saklofske, Prifitera, Weiss, Rolfhus, & Zhu, 2005), we reported the GAI for our sample of students.

The average GAI for our 18 gifted and talented students with ASD was in the 97th percentile. Such a high percentile ranking is very rare, and fewer than 3% of age-matched students have such outstanding overall verbal and nonverbal abilities. Because the GAI is comprised of the VCI and PRI, it is not surprising that these two index scores also were outstanding; the VCI average score was in the 95th percentile, and the PRI average score was in the 94th percentile. (Please note that it is an artifact of the statistical procedures used to compute the scores that results in a GAI score that is actually higher than either the VCI or the PRI). Thus, in our sample, participants' overall verbal and nonverbal skills were quite advanced in comparison to what would be considered "normal" or "average" for age-matched students. Conversely, participants' average score on the Processing Speed Index (PSI), which measures how quickly a student can process information, was in the 63rd percentile, which is considered average in comparison to age-mates. Similarly, participants' average score on the Working Memory Index (WMI), which measures a

student's short-term memory, was again considered average (70th percentile). Whereas it is typical for gifted students to have lower scores for the Processing Speed and Working Memory Indices (Sparrow, Pfeiffer, & Newman, 2005), the degree to which the scores from our sample differ from the VCI and PRI is not typical. Thus, for the gifted and talented child with ASD, it appears to take relatively longer for him or her to process information, and long-term auditory memory is stronger than short-term auditory memory overall. These large score discrepancies also help explain why educators, parents, and students become easily frustrated by the fact that some cognitive tasks are quite easy to learn, while others are significantly harder.

Academic achievement assessment. All participants completed an achievement measure that assessed reading, mathematics, and written language: the Woodcock-Johnson Tests of Achievement-Third Edition (WJ III; Woodcock, McGrew, & Mather, 2001). In our sample, students demonstrated outstanding word reading skills (98th percentile), reading speed (96th percentile), and reading comprehension skills (90th percentile) in comparison to other students in their grade. Although many students with ASD are thought to have advanced ability to decode words (the skill measured by Letter-Word Identification on the WJ III) with more average-range reading comprehension (Grigorenko et. al., 2002; O'Connor & Hermelin, 1994), this was not the case for our sample because reading for understanding (measured by the Passage Comprehension test on the WJ III) was also quite advanced.

Overall math performance on the WJ III was indicative of strong computation (90th percentile) and problem-solving skills (95th percentile). Students' ability to complete simple math facts quickly was more similar to the performance of the average student for their grade (73rd percentile). This means that some gifted and talented students with ASD may not be able to demonstrate their true math knowledge under timed circumstances because their difficulties (i.e., completing basic math quickly) would mask their talents (i.e., completing advanced math effectively).

A similar pattern unfolded on the written language tests. Here, the ability to quickly compose sentences was grade appropriate (50th percentile), but spelling and creative writing and composition skills were advanced (96th and 95th percentiles, respectively). For many of the students with fine-motor difficulties, accommodations, such as dictation, were employed, which seemed to help performance. Surprisingly, however, because it has been documented that many students with ASD struggle with fine-motor skills, which is sometimes referred to as *dysgraphia* (Rogers, Cook, & Meryl, 2005), only 29% of our students produced scores on a separate fine-motor test that were outside of what would be considered average for their age. Nevertheless, for the majority of students, fine-motor skills were well behind most of their other academic skills and abilities, creating a discrepancy that can be potentially frustrating for the

educator and the student. Thus, written language appears to be another academic area in which high abilities can be masked if a disability is not identified and accommodated.

Adaptive behavior assessment. To gain a sense of the students' daily functioning, the Vineland Adaptive Behavior Scales, Second Edition (Vineland-II; Sparrow, Balla, & Cicchetti, 2005) was administered. The Vineland-II, which examines communication, daily living, interpersonal, and motor skills, is used in a variety of medically and psychologically based settings to aid in the clinical diagnosis of various disorders, including ASD, for which it is important to know how symptoms affect a student's everyday life. For the students in our sample, average scores on the Communication scale, which measures expressive, receptive, and written daily skills, were considered age typical (50th percentile), as were average scores on the Daily Living Skills scale, which measures personal, domestic, and community skills (47th percentile). Most notable was that for all 18 participants diagnosed with ASD, scores on the Socialization domain were substantially lower (the average for the group was in the 6th percentile). This pattern of performance on the Vineland-II is, however, typical for students diagnosed with ASD. That is, when there is such a notable comparative discrepancy between Socialization (very low) and Communication and Daily Living Skills (average), this discrepancy alone is a strong predictor of ASD (Gillham, Carter, Volkmar, & Sparrow, 2000). Figure 1 provides a visual display of students' abilities that emphasizes the significant differences in the cognitive, academic, and adaptive functioning skills of these gifted and talented students with ASD. At this point, we do not know what this distribution would look like for a gifted and talented student without a disability, but we plan to be able to make this comparison in the future.

Developmental assessment. Two additional assessment instruments, both designed to make diagnoses of ASD, were administered to our participants. One instrument, the Autism Diagnostic Interview-Revised (ADI-R; Rutter, Couteur, & Lord, 2003), was administered to the parent; the other, the Autism Diagnostic Observation Schedule (ADOS; Lord, Rutter, DiLavore, & Risi, 2002), was administered to the student. The ADI-R is an extensive, developmental interview that is designed to obtain comprehensive information needed to formulate a diagnosis of ASD. The primary caretaker, usually one or both parents, is asked questions that focus on the three main areas of functioning associated with ASD: language/communication; reciprocal social interactions; and restricted, repetitive, and stereotyped behaviors and interests. The ADOS is a semistructured, standardized diagnostic assessment that accompanies the ADI-R and examines characteristics associated with an ASD diagnosis: communication; reciprocal social interaction; creativity; and restricted, repetitive, and stereotyped behaviors and interests. Although the Vineland-II also measures communication skills (i.e., expressive, receptive, and

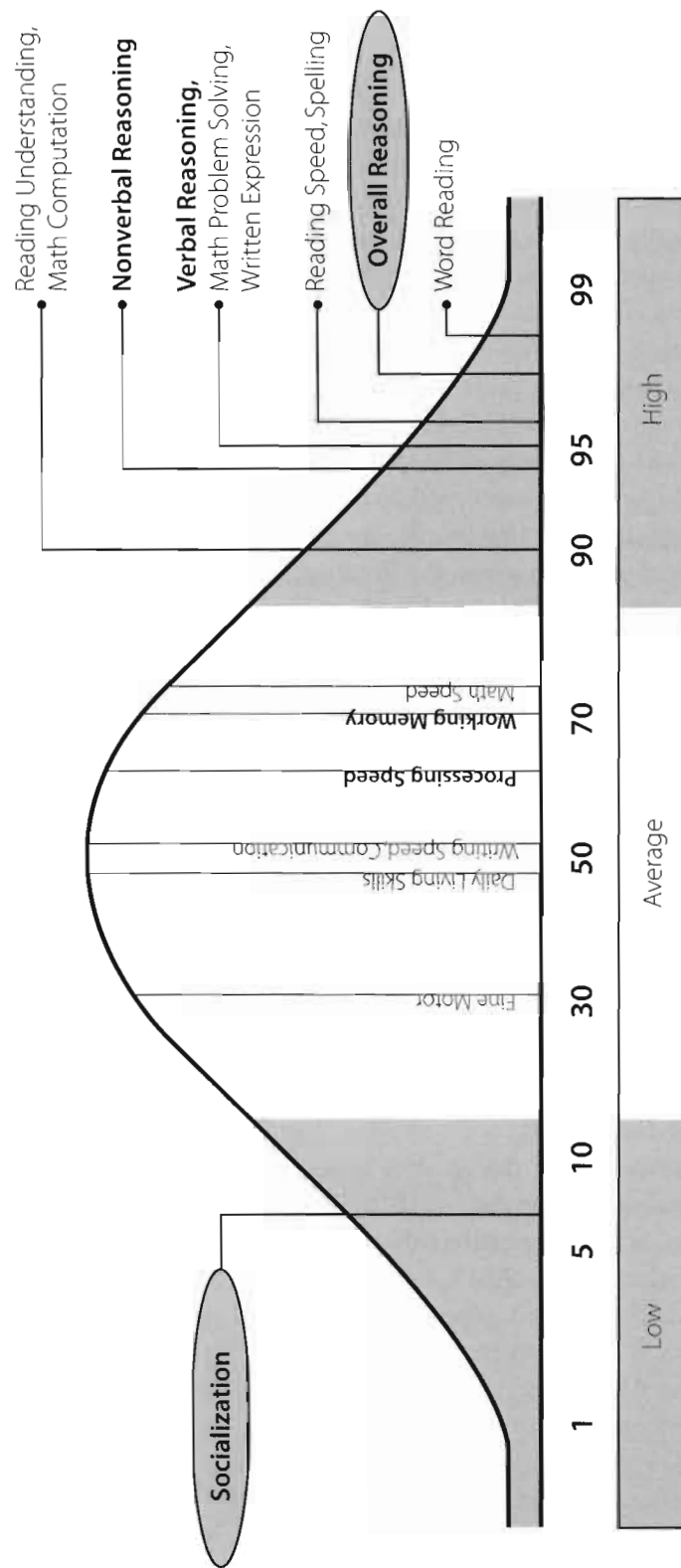


Figure 1. Comparison of general and specific skills.

written skills), the ADOS and ADI-R examine aspects of communication that correspond directly to the diagnostic criteria for ASD.

In our study, all 19 participants were administered the ADOS, and the ADI-R was completed with their parents. From these results, 11 received a diagnosis of Autistic Disorder, 6 received a diagnosis of Asperger's Disorder, 1 received a diagnosis of PDD-NOS, and 1 student's presentation was considered non-ASD. Certain patterns of performance emerged among these high-functioning students that are important to highlight.

In the area of communication, as measured by the ADOS, almost all participants had trouble establishing rapport and engaging in conversation with the examiner, and they typically did not demonstrate nonverbal skills (e.g., gesturing) to communicate effectively. Although not all used language in a stereotyped or idiosyncratic way, which is often a hallmark of autism, a majority of them did. On a positive note, slightly more than half of the students responded appropriately to an item that taps into self-reporting personal or nonroutine events, such as vacationing with family.

The ADOS also assesses for reciprocal social interaction, which includes multiple skills and behaviors. Although most students (72%) had no difficulty appropriately using eye contact during the hour-long assessment period, a very high percentage (83%) demonstrated a limited range of facial expressions. Furthermore, the majority (87%) had trouble exhibiting insight into the nature of various social relationships, such as friendship or marriage. The quality of the social overtures of all but one student (94%) was limited, and all participants showed some degree of difficulty responding socially to the examiner. All but two students (89%) had a limited ability to engage in reciprocal social communication (i.e., use of verbal and nonverbal means to communicate socially).

For the students in our study, parents provided ADI-R information about their child's development. The ADI-R interview begins with a general question asking parents when they first noticed something "not quite right" with their child's development. The majority of interviewees (72%) recalled observing difficulties with language, relationships, or behavior before their child was 3. The ADI-R assesses communication delays through a variety of questions that probe for possible areas of difficulty, including both verbal and nonverbal communication. Difficulty using gestures to convey a message was reported by 83% of parents, and 94% of parents reported that their child exhibited difficulty in spontaneously imitating the actions of others. Parents of all but one student reported that their child had trouble participating in social chat, and all reported that their child had some degree of difficulty engaging in reciprocal conversations. Finally, not many symptoms were noted in the area assessing stereotyped, repetitive, or idiosyncratic speech.

The second area assessed by the ADI-R, qualitative abnormalities in reciprocal social interaction, also addresses multiple behaviors. Parents of all but

one student indicated that in the early years, their child had trouble gazing and smiling socially at someone who was greeting him or her. Additionally, most parents (72%) indicated that their child demonstrated a limited range of facial expressions during the prekindergarten developmental period.

A third area on the ADI-R assesses the development of peer relationships. A typically developing child at age 4 plays imaginatively with other children, attends to a parent's voice, offers to share, and responds positively to the social approaches of others. Among our sample, students were reported to have the most trouble playing in group situations and engaging in imaginative play with peers (89% of parents reported those observations). Fewer parents (66%) indicated that their student showed limited interest in other children his or her age. Parents also were asked about their child's ability to share enjoyment with others during the developmental period of 4 years of age. Just more than half (61%) of the parents reported that their child had trouble showing and directing his or her attention to others, whereas more parents (78%) indicated that their child had trouble offering to share. Positively, more than half of the parents (56%) reported that their child sought to share his or her enjoyment or creations with others. Finally, most parents reported that their child did not demonstrate age-appropriate social responses (94%), had trouble offering comfort (78%), and had limited social overtures (72%) and social responses (94%).

The last area addressed by the ADI-R concerns restricted, repetitive, and stereotyped patterns of behavior. Among our sample of students, parents reported that their child had histories of developing unusual or highly specific patterns of interests that occurred to an unusually high degree (83%) and many had unusual sensory interests. However, the majority of parents indicated that their child had no atypical preoccupations (67%), verbal rituals (78%), compulsive behaviors (67%), complex mannerisms (61%), repetitive use of objects or interest in parts of objects (56%), or complex finger mannerisms (50%), all of which are behaviors typically assessed in students with ASD.

Social-emotional assessment. Social-emotional screening information also was gathered from parents, teachers, and students through the administration of the Behavior Assessment System for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2004). The BASC-2 is used to evaluate the behavior and self-perceptions of children and adolescents. Dimensions of emotion and behavior are assessed on the BASC-2 both in terms of positive and negative characteristics that a student may display.

In our study, there were distinct patterns of student behaviors and personality that were reported by parents as problematic. A large percentage (78%) of parents reported that their child exhibited "odd" or "strange" behaviors. Reynolds and Kamphaus (2004) suggested that students with ASD oftentimes display behaviors that correspond with elevations on this scale, frequently referred to as atypicality. As well, 78% of parents acknowledged their child's

tendency to evade others or avoid making contact in social situations, and, according to Reynolds and Kamphaus (1992), elevations in this area also indicate a core ASD symptom. Attention problems and distractibility also were noted by 67% of parents, and 78% reported that their son or daughter had difficulty adjusting to changes in routine, shifting focus, and sharing possessions. Exhibiting adequate social skills was a concern of most parents (72%), as was demonstrating age-appropriate daily living skills (61%), which is consistent with the Vineland-II results discussed previously.

Parents of 13 participants gave permission to have a teacher complete the BASC-2, and areas of teacher concern were highly similar to those of parents. That is, teachers surveyed believed that the student participants displayed odd behaviors (85%), withdrew from their classmates (76%), had difficulties with attention and focus (52%), and did not adjust well to change (69%). None of the teachers reported that the students had problems with learning, which emphasized their ability to observe students' areas of academic strength.

We also obtained BASC-2 self-report information from 14 of the students (the other 4 were not willing to complete the form). Although some students indicated feeling symptoms of distress, no scale was elevated in more than half of the participants. Collapsed group mean scores were well within what would be considered normal for the students' age, suggesting that, overall, these gifted and talented students with ASD did not perceive that they have difficulties in school, exhibit odd or problematic behavior, perceive social stress, struggle with depression or low self-esteem, feel a sense of inadequacy, have an external locus of control, have attention problems or symptoms of hyperactivity, argue with parents, have trouble making friends, or have low self-esteem or self-reliance. Figure 2 summarizes the BASC-2 results from parents, teachers, and students, and emphasizes the differences and similarities among these three groups.

An additional self-esteem measure, The Piers-Harris Children's Self-Concept Scale, Second Edition (Piers-Harris 2; Piers & Herzberg, 2002), was administered to gain a better understanding of participants' self-esteem. Again, the majority of responses were within the normal range, suggesting that this group of students' perceptions of their behavior, intellect, physical appearance, freedom from anxiety, popularity, and overall happiness were average or above average in comparison to other students from the normative population. Additionally, only one student questioned his or her high abilities, which indicates that the students were aware of their own areas of academic strength. It is important to note that Piers and Herzberg (2002) reported that gifted students, in most cases, produce higher self-concept ratings than children not identified as gifted. This was not the case for our students; instead, none of the students in our sample reported feeling particularly happy, and only one felt very positive about his or her physical appearance.

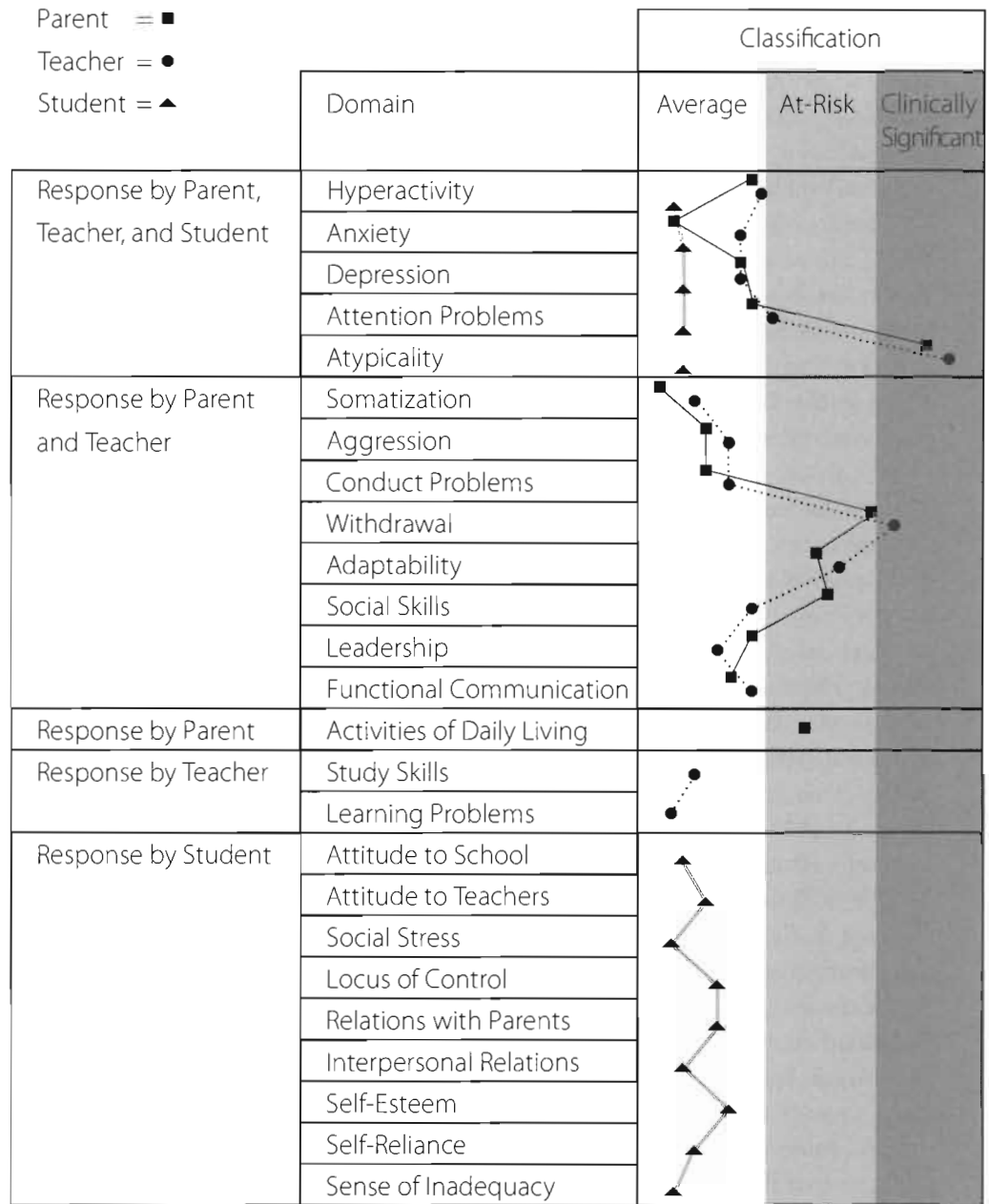


Figure 2. Comparison of BASC Standard Scores. Average Range denotes scores that are typical for a student of at his or her age, At-Risk Range denotes scores that indicate the potential for developing problems that need to be monitored, and Clinically Significant range denotes scores that suggest a high level of maladaptive behavior or lack of adaptive behavior.

Summary of Research and Recommended Applications

Preliminary results from the Iowa Twice-Exceptional Project demonstrated that a comprehensive assessment needs to be the first step toward identifying strengths and areas for growth in a gifted and talented student with ASD. For example, among our group of students, there are distinct, large differences within their academic, ability, and adaptive functioning profiles that have ramifications for educational interventions. Additionally, it has become clear that a comprehensive, developmental assessment must be completed with both the student and the parent or the primary caregiver so that interventions can be individualized to match each student's needs. Lastly, there seems to be common behavioral and emotional patterns that are observed by parents and teachers; yet, students often do not have similar self-perceptions. Although interventions always need to be tailored to the individual student, some general suggestions can be made for optimizing the twice-exceptional student's educational experience.

INTERVENTIONS—THE NEXT STEP

Interventions to help gifted children and adolescents with ASD are diverse. The primary goal is to provide an environment that balances nurturing their strengths and supporting their limitations (Neihart, 2000). An interdisciplinary collaborative team that includes multiple individuals, such as administrators, school psychologists, occupational therapists, social workers, behavioral specialists, speech and language specialists, classroom and special topic educators, and/or gifted specialists, is optimal to ensure appropriate and consistent services. Most states' special education regulations allow accommodations based on a medical diagnosis of ASD, but one's particular state guidelines should be consulted to discover how eligibility is determined. If an Individual Education Plan (IEP) or 504 Plan is developed, then accommodations and modifications can be made available that speak to the intellectual, academic, social, and emotional issues of gifted and talented students with ASD.

Successful educational interventions must be based on an extensive assessment; otherwise, educators intervene based on perceived needs rather than evidence-based needs. Interventions also require the following: (a) educator and counselor training about giftedness and ASD; (b) positive and consistent collaboration among regular educators, special education teachers, and gifted education teachers; (c) individualization of educational and psychosocial interventions to address strengths as well as areas for growth; (d) communication between parents and educators as to what is working and/or what changes need to be made; and (e) recognition that providing services to meet the stu-

dent's high academic ability likely will not exacerbate social-emotional difficulties. The following are some examples of accommodations in various areas of functioning that could benefit a gifted and talented student with ASD.

Academic Gifts and Talents

In a clinical setting, ideas about how to foster areas of talent and academic strength should be the first recommendations offered to parents. Taking this approach not only focuses on the student's strengths but also encourages parents and educators to take a holistic view of intervention. Some examples of academic recommendations are subject or whole-grade acceleration, enrichment, attending special programs for gifted students, cluster grouping, extracurricular activities, mentorships, or independent research activities. Furthermore, in cases where the twice-exceptional student processes information slower than his or her talented peers, speed of completing projects should be de-emphasized and tests should be given untimed. Once students reach adolescence, their intellectual and academic abilities and talents may have new outlets in high school extracurricular activities, community activities, or national competitions. A larger variety of challenging courses from which to choose may help in meeting their intellectual and academic needs.

Communication Accommodations

Gifted and talented children with ASD flourish in classrooms where communication is clear and consistent. A supportive teacher with an intuitive sense of how tone impacts understanding of instructions also is critical. Directives and classroom rules should be straightforward, accessible, and given with minimal words so that students understand expectations. Statements, such as "When you do this, then you can do that" or "First this is done, then this happens," clarify expectations.

Fine-Motor and Written Language Accommodations

If a gifted student with ASD exhibits fine-motor or written language difficulties, assistive technology, such as voice recognition software or word processing, likely would increase his or her ability to communicate, which makes early initiation of word processing and keyboarding skills essential (Moore, McGrath, & Thorpe, 2000). Additional time to complete tasks may be needed, especially if there is poor motor coordination or slower processing speed, and allowing students to write in test booklets rather than fill in an answer sheet also can be helpful. Referrals to occupational therapists may be necessary, as they are typically in the best position to provide individualized accommodations.

Attention and Memory Accommodations

Teaching strategies for improving attention and short-term memory is another area that will increase self-efficacy. Lovecky (2004) urged educators to use curriculum materials from students' high-interest areas and to establish well-defined parameters. Setting and enforcing a time or page limit helps to decrease perseveration and frustration. Written and oral checklists for tasks or assignments are helpful, as are frequent feedback and redirection. A nonverbal signal between the teacher and the twice-exceptional student for times when he or she is not attending may lessen anxiety related to embarrassment caused by public acknowledgement of one's difficulties. Encouraging the student to refocus on the task at hand and to save inner thoughts or fantasies for a later designated time could make the redirection more acceptable.

Accommodations for Stereotyped Patterns of Behavior and Restricted Interests

Perseveration on special interests is characteristic of many gifted and talented students with ASD. Educators can promote this potential distraction by controlling access to the interest during school time. Earning extra time to engage in their preferred activity, designating a scheduled time for their passion, or incorporating their interests into a class lesson are options. Having a mentor who is passionate about a similar topic or joining peers in an extra-curricular club or project are additional ways to respectfully acknowledge the special interests of these students.

Gifted and talented students with ASD also may have trouble adjusting to changes in daily routine, therefore alerting them to differences is essential so they know what to expect and how to cope with the change. Visuals, scripts, and time warnings are all graphic ways to ensure that students understand the process of change in their daily lives.

Accommodations for Social Interactions

Gifted and talented students with ASD need opportunities for social interaction so that they can establish positive interpersonal relationships and improve their social skills. Understanding the perspective and feelings of others is a necessary component of any social skills program for twice-exceptional students. Noticing the similarities and differences of their peers can provide a better understanding of their relationships with others. For example, when a gifted and talented student with ASD uses a Venn diagram to show how he is the same and different from classmates, it illustrates in an intellectual and graphic way his perceptions of his social interactions. This, in turn, can help an educator or counselor

prioritize social skills so they can be practiced in a safe environment, as well as provide insight into the student's self-perceptions and limitations.

Identification of others' emotions through verbal and nonverbal expressions is typically difficult for a gifted and talented student with ASD. Participation in social skills training groups can increase listening skills, turn taking, and initiating, maintaining, and ending conversations. Individual and peer skill-building programs developed by Baker (2003), Dunn and Myles (2006), and Faherty (2000) are resources for educators and counselors to help twice-exceptional students develop social skills.

Psychosocial Interventions

The sensitivity and emotional responsiveness of a gifted and talented child often is intensified when another exceptionality is present (Cross, 2004), and intense anxiety and depression are common emotional responses for gifted and talented students with ASD when their needs are not met (Amend & Schuler, 2004). High cognitive abilities, strong verbal skills, a keen sense of justice and honesty, as well as a sense of humor, are characteristics that can be used, if present, to help gifted and talented students with ASD to recognize, label, and identify their emotional states. Use of bibliotherapy, cartoons, magazines, and photographs can be used to understand how they and others may feel and respond to specific situations.

A behavioral treatment plan often is advantageous in helping gifted and talented students with ASD learn emotional self-control (Tantam, 2003). Skills such as identifying emotions of self and others, reacting to those emotions, perspective taking, emotional reciprocity, and sensitivity to criticism may have to be taught through direct instruction (Myles & Southwick, 1999). In addition, providing a safe place to go where there is an understanding adult is a vital accommodation for a twice-exceptional child who is experiencing intense frustration, anger, or rage.

Educators and counselors can help students recognize the intensity of their emotions in certain situations, such as test taking, fire drills, transitions, making mistakes, social rejection, and so forth. The psychologist can work with the student to identify healthy and positive ways to deal with stress (Buron & Curtis, 2003) and initiate self-regulation strategies (Williams & Shellenberger, 1996). Setting time limits for worry, replacing frightening images with positive ones, and role-playing "emergency" and transition situations will help alleviate extreme anxiety.

Another characteristic that is typical of both giftedness and ASD is perfectionism (Amend & Schuler, 2004). The self-imposed pressure to perform perfectly increases frustration and may impede the student's ability to complete work. Specific teacher recommendations to help a gifted and talented student

with ASD deal with performance perfectionism include providing opportunities to fail in a safe environment, teaching goal-setting skills, focusing on strengths, de-emphasizing exactness, encouraging and supporting risks to try open-ended creative activities, and breaking work into small, manageable steps.

BRIAN: A CASE OF MISSED DIAGNOSIS

Brian, a 10-year-old gifted and talented student, was struggling with the complex and abstract work in his public school accelerated program. He had been identified as gifted and admitted to a fourth-grade program based on his scores on group testing of cognitive ability, academic skills, and work samples. Math and science were particularly strong, while language arts proved a bit more difficult, especially writing assignments.

Historically, Brian had difficulty transitioning from one activity to another, and this became more troublesome in a new school environment. His social interactions were awkward, and his anxiety escalated with the demands of the program. He was placed on several different medications in an attempt to manage his behavior and emotions, and a variety of diagnostic labels were used to describe his symptoms of depression, anxiety, and ADHD. Unfortunately, medications provided little relief, and Brian soon became suicidal and was hospitalized. During hospitalization, he was diagnosed with Asperger's Disorder. Prior to this escalation of symptoms and hospitalization, Brian's unusual behaviors had been attributed to his giftedness—he was simply thought to be a “quirky, gifted kid” by teachers and other students. Had Asperger's Disorder been previously identified, appropriate interventions could have been implemented much sooner, and hospitalization may have been avoided. This case highlights the importance of not overlooking the possibility of ASD in a gifted child. The missed diagnosis created additional difficulties that might have been avoidable.

Once the diagnosis was accurately made, interventions to address strengths arising from giftedness and limitations due to ASD were identified and implemented throughout the remaining school year. Brian's curriculum was modified and accommodations were made for his anxiety. An IEP was written to include a de-escalation plan for times of anxiety and modifications for difficulties with writing assignments (e.g., initiating keyboarding instruction). Extended time limits and modifications for group work were made, and social skills training was initiated. Brian remained on a stimulant medication to help him focus on tasks and screen out distracting events.

Unfortunately, when Brian transitioned to middle school for sixth grade, the year began tenuously for a variety of reasons. First, the gifted program was not self-contained, and Brian spent increased time with a larger population of students in a new environment. Second, administrative support was

not as strong as the prior year, and IEP implementation was fair at best. Third, despite being told about his diagnosis, some teachers did not recognize Brian's disorder and instead attributed his behaviors to oppositional or aggressive tendencies. One teacher believed all of Brian's inappropriate behaviors to be willful and insisted on detention. Some refused to acknowledge ASD, primarily due to limited understanding of the condition. Finally, several teachers refused to believe Brian was gifted, as he was unable to show his strengths without accommodations on the abstract assignments that were required. He struggled through sixth grade, and seventh grade was marginally better even though he was assigned a full-time paraprofessional aide to assist in the regular classroom. It was an unfortunate situation for Brian and his family during his middle school years until he was eventually grade accelerated. Brian skipped eighth grade, and entered ninth grade at a high school with an accelerated program that had served children with ASD in the past. Once again, with support, Brian thrived in his areas of strength—math and science.

Brian eventually completed high school. He scored a 32 on his ACT exam (greater than the 99th percentile) and was admitted to a local university with a strong history for serving children with disabilities. Although he continues to struggle at times with the social necessities of dormitory life, he is progressing appropriately in all academic areas while pursuing a degree in mathematics.

As was the case for Brian, missed diagnosis complicates the intervention process. Once accurate identification of ASD and giftedness is made, accommodations can be implemented to foster academic strengths while minimizing the impact of academic difficulties and communication, social, and behavioral impairments.

CONCLUSION

The focus of this chapter was to emphasize the need for the comprehensive evaluation of gifted and talented students with ASD so that appropriate interventions can be implemented early and effectively. As was highlighted by multiple case studies (Lovecky, 2004; Neihart, 2000; Webb et al. 2005) and supported by the initial results from the Iowa Twice-Exceptional Project, professionals need to be aware of not only the characteristics of gifted students or students with ASD, but also how the interplay of ASD and giftedness and talent leads to a distinct and separate group of characteristics that support the need for educational challenges as well as accommodations.

For example, students who are verbally gifted often have excellent word reading and comprehension skills and are very fast readers. Students who are not gifted but are diagnosed with ASD often have excellent word reading skills; however, their comprehension is low. For a gifted and talented student with ASD,

the student's comprehension may be slightly lower than his or her outstanding word reading and reading speed skills, but reading understanding probably is much higher than what would be typical for the student's age. Socially, a gifted and talented student (who does not have a diagnosis of ASD) may have less need for several friends, but a student with ASD may isolate him- or herself due to an inability to relate interpersonally. For a gifted and talented student with ASD, lack of intellectual peers may make it even more difficult to interact socially with age-mates or to find peers with common interests.

Although the empirical results from the Iowa Twice-Exceptional Project are preliminary, clear and distinct academic, social, and behavioral characteristics of the gifted and talented student with ASD are beginning to unfold. These characteristics can serve as guiding principles for educational professionals to consult when making referrals for comprehensive assessment, but perceiving the twice-exceptional student as one who requires individualized interventions cannot be emphasized enough. Only through a comprehensive evaluation can individual strengths and areas for growth be identified that will guide appropriate intervention recommendations. As we learn more about this extremely rare and challenging population, we will consistently strive to provide better and more informed ways to meet all of their diverse needs.

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