

Asperger Syndrome: An Overview of Characteristics

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Although the prevalence of Asperger syndrome (AS) is increasing, many children and youth who exhibit characteristics associated with this disability are not diagnosed until their later years. Because early intervention appears to be critical for individuals with AS, it is important that educators, families, and physicians have a comprehensive understanding of this complex exceptionality. This article, in an attempt to meet the aforementioned need, describes the characteristics of Asperger syndrome and the syndrome's impact in the home, school, and community.

Our earliest understanding of Asperger syndrome (AS) is attributed to Hans Asperger, a Viennese physician. In 1944, Asperger described a group of children who exhibited social peculiarities and social isolation, albeit with average cognitive and language development. Based on these characteristics, Asperger stated that his sample represented an independent and distinct clinical condition. In 1981, Wing brought AS to the attention of clinical professionals when she published a paper in which she discussed the syndrome based on her work with 35 individuals ranging in age from 5 to 35 years. Recognition of AS was further advanced in 1994, when the American Psychiatric Association added the syndrome to its list of pervasive developmental disorders identified in the *Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition (DSM-IV)*; American Psychiatric Association, 1994).

The past several years have been witness to a phenomenal increase in the recognition and use of the clinical term *Asperger syndrome*, and today AS is a relatively common developmental disability

whose impact is profound (Barnhill, 2001b). Although the term is widely used, there is intense debate over whether AS is an independent diagnostic category or is an element of the autism spectrum (Klin, Volkmar, & Sparrow, 2000). There is no debate, however, over the fact that an increasing number of individuals are being diagnosed with AS (Ehlers & Gillberg, 1993). The most recent edition of the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., Text Revision; *DSM-IV-TR*; American Psychiatric Association, 2000) lacks a prevalence estimate for AS; however, it has been estimated that as many as 48 per 10,000 children could have the syndrome (Kadesjo, Gillberg, & Nagberg, 1999).

There is much to be learned about this disorder. The educational community and families of students with AS have been challenged to implement effective supports and interventions for these students, despite the lack of a clear understanding of the disorder and without empirical direction as to the educational methods that are most suitable. In this connection, the present article discusses characteristics of AS, especially those ger-

mane to educators that can be used as a basis for planning appropriate programs.

Characteristics of Asperger Syndrome

Clinicians, including psychiatrists, clinical psychologists, and related professionals, typically diagnose Asperger syndrome on the basis of criteria provided in the *DSM-IV-TR*. In addition to guiding the diagnostic process, this resource (summarized in the Appendix) provides a cursory understanding of the disorder and the behaviors that correlate with its diagnosis.

Although it is important for professionals working with children and youth with AS (researchers, counselors, school psychologists, related service professionals) to be familiar with the *DSM-IV-TR* criteria, that resource does not provide an understanding of the characteristics that most directly relate to and affect school performance. Accordingly, school professionals must have a working knowledge of the school-related social, behavioral/emotional, intellectual/cognitive, academic, sensory, and motor characteristics of students with AS to effectively meet these individuals' complex and variable school, home, and community needs.

Social Characteristics of Students with AS

AS is foremost a social disorder (Frith, 1991; Myles & Adreon, 2001; Myles &

Simpson, 2001; Szatmari, 1991); however, in contrast to most other children on the autism spectrum, individuals with AS *desire* social interactions with others. Their social difficulties frequently stem from a lack of skill in initiating and responding to various situations, as well as an inability to infer the thoughts or beliefs of others (Barnhill, 2001a; Ozonoff, Rogers, & Pennington, 1991).

Children and youth with AS are typically thought to be socially stiff, socially awkward, emotionally blunted, self-centered, deficient at understanding nonverbal social cues, and inflexible. Although individuals with AS may be able to infer the meaning of facial expressions and match events with facial expression, they can do so only in isolation; that is, they cannot interpret the simultaneous presentation of facial expressions, posture, gestures, and voice tone in social contexts (Koning & McGill-Evans, 2001). Therefore, even when children and adolescents with AS actively try to seek out others, social isolation frequently ensues because of their lack of understanding of the rules of social behavior involving eye contact, proximity to others, gestures, posture, and so forth (Myles & Southwick, 1999).

It is not unusual for students with AS to use rudimentary social skills, such as greeting someone, without being able to extend or reciprocate interactions. According to Myles and Simpson (1998), individuals with AS often lack common sense and an awareness of social standards; tend to misinterpret subtle social prompts, cues, and unspoken messages; and display a range of socially unacceptable behaviors.

It is also common for students with AS to be emotionally vulnerable and to experience stress (Barnhill, 2001a; Myles & Adreon, 2001). However, in contrast to most children and youth, children with AS do not generally reveal stress through voice tone or posture, and thus situations may escalate to a point of crisis before others are aware of their excitement or discomfort (Myles & Southwick, 1999). It should also be obvious from this description that children and youth with AS

are relatively easy targets for bullying by others.

Although they are well known for their lack of social awareness, many students with AS are aware enough to sense that they are different from their peers. Thus, self-esteem problems and self-concept difficulties are common among individuals with AS. These problems are often particularly significant during adolescence and young adulthood (Myles & Adreon, 2001), though youth with AS may deny their existence.

When children and youth learn social conventions, they often try to apply them universally. However, social conventions are variable, making them difficult to rigidly and consistently apply. This lack of social consistency is especially confusing for children with AS, who painfully discover that interactions that may be reinforced in one setting are punished in others (Myles & Simpson, 2002).

In addition to the aforementioned problems, individuals with AS have difficulty understanding and appreciating the feelings and thoughts of others (Barnhill 2001a; Baron-Cohen, Leslie, & Frith, 1985), often called "theory of mind." According to Ozonoff et al. (1991), children and youth with AS may be able to complete theory-of-mind exercises but not apply those skills in real-life situations. Theory-of-mind challenges are related to a variety of issues, including (a) difficulty inferring the intentions of others, (b) a lack of understanding of how their own behavior affects others, and (c) difficulty with turn-taking and other reciprocal skills.

Children and youth with AS do not acquire greater social awareness and skill merely as a function of age. Rather, individuals diagnosed with AS may find themselves more and more in conflict with prevailing social norms as they move through adolescence and young adulthood, when social growth is the norm. As a result, individuals with AS are vulnerable to developing a variety of problems, including increased discomfort and anxiety in social situations, depression, and anxiety (Barnhill, 2001a; Cesaroni & Garber, 1991; Ghaziuddin, Weidmer-

Mikhail, & Ghaziuddin, 1998; Wing, 1981).

Behavioral and Emotional Characteristics of Students with AS

That children and youth with AS often experience behavioral and emotional problems connected to their social deficits is clearly evident. Moreover, these problems and challenges frequently involve feelings of stress or loss of control, and the inability to predict outcomes (Myles & Southwick, 1999). Thus, students with AS typically have behavior problems connected to their inability to function in a world they see as unpredictable and threatening.

In one of the few studies that have attempted to identify the nature of behavior problems and adaptive behavior among students with AS, Barnhill, Hagiwara, Myles, Simpson, Brick, and Griswold (2000) compared the perceptions of parents, teachers, and students with AS. This study revealed that the parents had significantly greater concern about the behavior and social skills of their children than did the students' teachers. The parents reported significant challenges related to conduct problems, aggression, and hyperactivity, as well as internalizing problems, such as withdrawal. The teachers, on the other hand, perceived the children and youth to have both fewer and less significant deficits than did the parents, although they did view the students to be "at risk" in areas related to anxiety, depression, attention, and withdrawal. The students' self-reports revealed that they did not perceive themselves to have significant problems or to be at risk on any of the social, emotional, or behavioral areas measured by the scale.

Seeking to further understand emotional issues in children and youth with AS, Barnhill and Myles (2001) examined attributions and depression in individuals with AS. They found that by adolescence, 80% of the adolescents they studied had been prescribed antidepressive medications and that depressive symptoms did not differ across age. The most

salient finding of this study was that the individuals with AS had a learned helplessness style and blamed themselves for negative events. In addition, they considered the cause of a particular event to be consistent over time and to generalize across many events. A similar study, by Barnhill (2001a), examined the relationship between depression and social attributions and found a significant relationship between level of depression and social failures. That is, the more the students with AS attributed their social problems to their ability and effort, the more depressed they were.

Restricted Range of Interests

Individuals with AS often have a restricted range of interests (Gagnon, 2001; Szatmari, 1991). No pattern has been found in the forms of special interests that have been selected by individuals with AS; however, they are diverse and encompass such subjects as geology, astronomy, mechanics, numbers, and fabrics. According to Barnhill (2001b), "It is possible that individuals with AS use these interests because they (a) facilitate conversation, (b) indicate intelligence, (c) provide an enjoyable activity, (d) serve as a means of relaxation, or (e) provide order and consistency in the person's life" (p. 262). Obsessive interests may include topics that are similar to those enjoyed by same-age nondisabled peers, but individuals with AS will often choose one topic to the exclusion of all others or will possess a degree of knowledge on a topic that is not consistent with that of neurotypical peers.

Intellectual and Cognitive Characteristics of Students with AS

The *DSM-IV-TR* clearly states that for a diagnosis of AS to be rendered, an individual must present with normal intellectual and language development (American Psychiatric Association, 2000). However, surprisingly little is known about the cognitive abilities of students diagnosed with AS. In fact, much of what is assumed about their intellectual abilities is based on inferences from studies

of individuals with high-functioning autism. Some researchers have reported an uneven cognitive profile pattern on individualized IQ tests, including significantly higher Performance IQ scores when compared to Verbal IQ scores for individuals with high-functioning autism and AS (Ehlers et al., 1997; Lincoln, Courchesne, Kilman, Elmasian, & Allen, 1988). According to their performance on IQ tests, students with high-functioning autism and AS have relative strengths on nonverbal concept formation tasks, specifically those that require perceptual organization and spatial visualization (Ehlers et al., 1997). Relatively poor performance has been reported in understanding of social mores and interpersonal situations, social judgment, common sense, and understanding of social conventions.

Barnhill, Hagiwara, Myles, and Simpson (2000) conducted one of the few studies that specifically addressed the cognitive abilities of individuals with AS. The 37 children and youth with AS who participated in that investigation generally had IQs within the average range, although the scores ranged from intellectually deficient to very superior. No significant difference existed between Verbal IQ and Performance IQ scores. The study revealed relatively high Block Design subtest scores, which suggests generally strong nonverbal reasoning ability and visual-motor spatial integration skill. Relatively low scores were found on the Coding subtest, suggesting that many of the participants had visual-motor coordination difficulties, were distractible, were disinterested in school-related tasks, and had visual-memory weakness. The students also obtained relatively low scores on the Comprehension subtest, suggesting poor social judgment. It is important to note, however, that this study (and other studies on this topic) failed to identify a specific cognitive profile among individuals with AS.

Academic Characteristics of Students with AS

Most children and youth with AS receive the majority of their education in general

education classrooms. In many ways students diagnosed with AS are well qualified to benefit from this environment: They typically have average to above-average intellectual abilities, are motivated to be with their general education peers, and have good rote memory skills and other assets that bode well for their educational success. However, students with AS frequently experience significant academic problems, which are often related to social and communication deficits, obsessive and narrowly defined interests, concrete and literal thinking styles, inflexibility, poor problem-solving skills, poor organizational skills, and difficulty in discerning relevant from irrelevant stimuli (Frith, 1991; Siegel, Minshew, & Goldstein, 1996). Moreover, they frequently experience difficulty with generalizing information. However, with suitable support, most students with AS are able to be successful in school, and a number go on to attend college and embark on successful careers.

Students with AS are generally thought to have particular difficulty in comprehending abstract materials (e.g., metaphors, idioms); understanding inferentially based materials; and applying skills and knowledge to solve problems. A strength among children and youth diagnosed with AS is in comprehension of factual material (Church, Alisanki, & Amanullah, 2000).

In studies of academic achievement by Griswold, Barnhill, Myles, Hagiwara, and Simpson (in press) and Myles et al. (2002) the students' mean academic achievement scores fell within the average range, but overall the scores ranged from significantly below average to significantly above average. Strengths generally were evidenced in oral expression and reading recognition, while weaknesses were seen in the area of comprehending verbally presented information. The students' written language scores were also significantly lower than their oral expression scores. Low mathematics scores were also found, especially related to solving equations and answering mathematical calculation problems. Finally, students who participated in the studies had significant difficulties in the

areas of problem solving and language-based critical thinking. Predictably, these studies reported that in spite of being very verbal, students with AS had significant difficulties in understanding the orally presented messages of others and arriving at logical solutions to routine real-life problems.

It is also important to note that many teachers fail to recognize the special academic needs of children and adolescents with AS because these students often give the impression that they understand more than they do (Myles & Simpson, 2001). Thus, their pedantic style (Ghaziuddin & Gerstein, 1996), seemingly advanced vocabularies, parrot-like responses, and ability to word call may actually mask the deficits in higher order thinking and comprehension of some students with AS.

Sensory Characteristics of Students with AS

In his original study of children with AS, Asperger (1944) observed that his participants had peculiar responses to sensory stimuli. Today this pattern continues (American Psychiatric Association, 2000; Myles, Cook, Miller, Rinner, & Robbins, 2000). The sensory issues seen in children and youth with AS are pervasive and appear similar to those of individuals with autism; however, the reactions to sensory issues by the former seem more overt (Rinner, 2000).

To date, only one study has been published on the sensory characteristics of individuals with AS. Dunn, Myles, and Orr (2002) found that the vast majority of children and youth with AS who participated in their study had impairments in (a) endurance/tone, (b) oral sensory sensitivity, (c) attention, and (d) registration. Over 75% of the individuals with AS studied demonstrated behavioral problems when sensory issues were violated. The authors concluded that individuals with AS have a sensory profile distinctive from that of neurotypical individuals and are apt to demonstrate disruptive behaviors when they encounter sensory problems.

Motor Characteristics of Students with AS

Wing (1981) observed that children with AS tend to have poor motor skills, along with coordination and balance problems. Others have also reported these problems (Dunn et al., 2002; Ghaziuddin & Butler, 1998; Ghaziuddin, Butler, Tsai, & Ghaziuddin, 1994; Myles et al., 2000; Smith, 2000; Smith & Bryson, 1994). The implications of such deficits are very significant, affecting sports, social skills, writing, art, industrial arts, and more (Myles et al., 2000). Although there is some dispute over the existence of motor delays and aberrations among individuals with AS (Manjiviona & Prior, 1995), there seems to be sufficient evidence to indicate to educators this is a potential problem.

Conclusions

Only recently has AS been showing up on the educational radar. Ever-increasing numbers of children and youth are being identified with the disorder, and teachers, administrators, counselors, and other educational professionals are quickly discovering that children and youth with AS are extremely challenging to serve effectively. This challenge is often related to a lack of understanding of the perplexing and sometimes seemingly contradictory characteristics of AS. For example, educators often have difficulty separating verbosity from a true understanding of language. Educational placement is problematic for children and youth with AS. They spend the majority of their time in general education with professionals who do not generally have specialized training with students with disabilities. Furthermore, their placement in general education classrooms means that they will share space and experiences with normally developing and achieving classmates, who can be expected to have limited tolerance (at least without instruction and other interventions) for peers who fail to understand and follow the oftentimes complex and frequently unstated rules of their classroom and school.

It is also significant that both educational and noneducational professionals are struggling to understand the nature and unique qualities of AS (Church et al., 2000; Klin et al., 2000; Myles & Simpson, 2002). Indeed, myriad unanswered basic questions related to the nature and characteristics of the disorder daily confront professionals and parents who must diagnose, teach, raise and otherwise support children and youth identified as having AS. Educators, parents, and other professionals must accept that we currently lack a definitive idea of which methods and strategies bode best for children and youth with AS. At the same time, we are encouraged by the ever-increasing flow of information related to accommodations, supports, methods, and interventions that can be applied to meet the needs of these students (Bock, 2001; Myles & Adreon, 2001; Myles & Simpson, 2001, 2002; Myles & Southwick, 1999; Williams, 2001).

Of course, increased availability of instructional methods and strategies is no assurance that educators will be aware of and effectively use these options, though it is an important first step. We also think it is important that both professionals and parents accept that there will not be a single effective practice for all children and youth with AS. Individuals with this complex disorder give every indication of having needs that can be addressed effectively only when trained professionals correctly use a variety of appropriate methods in an individualized fashion. That these methods must address multiple domains related to AS, including social, behavioral, academic, motor, and sensory domains, across school, home, and community settings, is very clear. Students with AS often appear to be overwhelmed, stressed, and frustrated by our complex, dynamic world. An understanding of the characteristics of Asperger syndrome is the first step in selecting accommodations, interventions, and environmental supports that can ensure their educational advancement.

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APPENDIX

DSM-IV-TR Diagnostic Criteria for Asperger Syndrome

- A. Qualitative impairment in social interaction, as shown by a minimum of two of the following:
1. Significant impairment in use of nonverbal behavior, such as social interaction gestures, facial expression, eye-to-eye contact, and body postures.
 2. Inability to form and maintain developmentally appropriate relationships with peers.
 3. Failure to spontaneously seek out others for interactions, such as by sharing interests, achievements, and so forth.
 4. Difficulty with social or emotional reciprocity.
- B. Repetitive and restricted stereotyped patterns of behavior, activities, and interests, as shown by at least one of the following:
1. Significant preoccupation with one or more stereotyped and restricted interests whose focus or intensity makes it abnormal.
 2. Significant manifestation of nonfunctional routines or inflexible adherence to rituals.
 3. Repetitive and stereotyped motor movements, such as complex whole-body movements, or hand or finger flapping or twisting.
 4. Significant and persistent preoccupation with parts of objects.
- C. Clinically significant social, occupational, or other functioning impairment.
- D. Absence of a clinically significant general language delay.
- E. Absence of a clinically significant delay in cognitive development or in development of age-appropriate adaptive behavior (other than social interaction), self-help skills, and childhood curiosity about the environment.
- F. Failure to meet diagnostic criteria for schizophrenia, or for other types of pervasive developmental disorders.

Note. Reprinted with permission from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*. Washington, DC, American Psychiatric Association, 2000.

ERRATUM

In the article "The Effect of an Augmentative Communication Intervention on the Communication, Behavior, and Academic Program of an Adolescent with Autism," by Joanne M. Cafiero, which appeared in *Focus on Autism and Other Developmental Disabilities*, Volume 16, Number 3, Figures 4 and 5—both actual figure and caption—were inadvertently switched. Figure 4 should have been "Functional picture lexicon (initiations) over 22-month period," and Figure 5 should have been "Mean frequency of out-of-seat behavior" to match the text discussion. We apologize for the error.