

## Educational Implications

The following is an overview of characteristics of students with autism spectrum disorders (AU). Each of the characteristics discussed below varies significantly within and across individuals with autism spectrum disorders. Thus, students with autism have varying degrees of challenges and strengths in each of the areas reviewed below.

### Cognition

Child may ...

- Have an intelligence quotient that ranges from the severely cognitively disabled to gifted
- Be nonverbal or be highly verbal
- Have rote memory that exceeds his or her ability to comprehend information

Individuals with autism spectrum disorders manifest a number of characteristics that vary in appearance and severity. Cognition is no exception. Although it is widely accepted and acknowledged that one group – individuals with Asperger Syndrome – have an average or above-average intelligence quotient (IQ), debate exists about cognitive disabilities in autism spectrum disorders.

Recent research reports that a majority of individuals with autism spectrum disorders may have IQs in the cognitively disabled or mentally retarded range. At the same time, research is equivocal regarding the number of children with autism who are nonverbal, with percentages ranging from a low of 4% to a high of over 50%. It is widely accepted, however, that the majority of individuals with AU will need assistance with language and communication skills.

## Seeing the Big Picture

Child may ...

- Have difficulty taking the perspective of others
- Struggle to understand and deal with abstract concepts and thoughts

Many individuals with autism spectrum disorders react and interact with the world around them from a single point of view. They focus on details and often miss how they themselves are intertwined with and impact the greater world around them. It is difficult to have a perspective of others if one is not aware of one's own actions and thoughts. Perspective taking includes not only an awareness of one's own thoughts, perceptions, and ideas, but also an awareness of the potential thoughts, perceptions, and ideas of those around. Such awareness allows one to recognize and predict how one's actions and reactions influence a situation or other people. It also allows one to step into the shoes of another person and see the world through his or her eyes.

## Self-Regulation

Child may ...

- Have a preferred item or routine for comfort
- Be sensitive to even the tiniest stimuli in the environment
- Have difficulty processing and regulating sensory input
- Have difficulty organizing information and routines
- Have raised levels of anxiety
- Have difficulty understanding and regulating emotions
- Easily trigger into a meltdown if unable to regulate, predict, or control a situation

Individuals with autism have challenges with self-regulation, often brought about by or aggravated by issues related to all of the sensory systems (see the following overview of the sensory systems), which may manifest in being either over- or under-sensitive to various

stimuli. That is, they may be sensitive to touch, certain types of lighting, temperature, specific sounds, food, holding their head upside down to pick up books, etc. However, they may also lack sensitivity to or awareness of stimuli such as not feeling pain or cold, for example. In addition, they often cannot detect when they are experiencing sensory challenges. When asked if they are upset or uncomfortable, therefore, students with autism may reply in the negative, yet soon thereafter experience a tantrum, rage, or meltdown. In addition, they may not show the same affect as others when under stress or anxiety.

Failing to interpret students' true emotional and sensory state, teachers may try to teach children with autism necessary skills when a meltdown or other behavioral episode has taken place. This is ineffective because *students with autism cannot learn new skills when stressed or anxious*. An important distinction must be made here: This does not mean that they will not be able to *recite* the new skill – only that they cannot *use* the skill.

Finally, individuals with AU do not inherently know what to do to self-calm, refocus, or relax. In the absence of knowing how to return to a typical state of mind, the student with autism is often the victim of tantrums, rage, and meltdowns.

## Uncertainty

Child may ...

- Prefer structure and sameness
- Need explanations of transition or change in schedule
- Like to anticipate and predict the steps in a routine
- Prefer advanced notice or warning about individual steps in a process, change in routine, or an upcoming transition

Children with autism spectrum disorders need predictability, routine, and sameness. It gives them a sense of certainty over their day. Therefore, if something is out of the ordinary, whether it is something as seemingly simple as an item that is stored in a new place or an event that is

added to the typical schedule, it might cause anxiety, confusion, and frustration. That is, when the individual is unable to predict what will occur next, the result is a sense of discomfort and worry, which intensifies as the typically predictable circumstance lessens.

The same reaction can also be observed in interactions with others. Often individuals with autism spectrum disorders have narrow special or unique interests as well as a single frame of reference – their own. Both of these characteristics lead the individual to believe that his perspective or bank of knowledge is not only correct, but sometimes is the only point of view. So if someone challenges his point of view or disagrees with him, it may be difficult for him to be flexible and adapt to the new perspective being presented (refer also to "Seeing the Big Picture").

For some of the same reasons, transitioning from one activity to the next may be difficult, especially if there is not much warning or advance notice. Forewarning that an interruption is coming or that the conclusion of an activity is near, allows the child to predict the change and to plan in advance for a variation of the schedule.

## **Understanding the Thoughts and Feelings of Others**

Child may ...

- Fail to directly answer questions
- Be unable to understand the inferred meaning of idioms, metaphors, or comparisons
- Not understand sarcasm or jokes
- Be a literal thinker or interpreter of words
- Have difficulty recognizing and interpreting facial cues, body language, voice inflection, and gestures
- Be overwhelmed by multifaceted communication, such as lengthy utterances, multiple directions
- Have difficulty recognizing, interpreting, and empathizing with the emotions of others

Social reciprocity – the give-and-take in communicating and interacting with others – is a core deficit in autism. Being able to identify and interpret the many subtle components of communication is essential for understanding what is being conveyed. Therefore, deficits in this area can seriously impact interactions with others.

Nonverbal cues such as facial expressions, body posture, and gestures all play a role in communication. They convey the thoughts, feelings, and intentions of others and guide our response to those with whom we interact. Individuals with autism must be taught how to recognize nonverbal cues as well as how and when to respond to them appropriately. In addition to recognizing these cues of others, individuals with autism must also be taught the messages they send through their own posture, facial expression, proximity, and gaze. Demonstrating how to use the body to express feelings or to show that they are listening will assist individuals in accurately conveying their intended message. Lastly, individuals with autism are typically literal interpreters of words and may not easily recognize idioms, metaphors, slang phrases, or sarcasm, causing confusion and lack of understanding in many everyday situations.

## Social Interactions

Child may ...

- Talk about unusual subjects
- Refer to a script to converse or answer questions
- Be unable to understand the inferred meaning of idioms, metaphors, or comparisons
- Not understand sarcasm or jokes
- Be a literal thinker or interpreter of words
- Find it easier to answer questions given choices versus open-ended options

Most children with autism spectrum disorders want to interact with others, but they struggle with knowing how to join in. Also, once they have joined in, they have difficulty maintaining their part of an interaction. Some abruptly push their way into a group, dominating the conversation with information about their favorite topic or using behaviors (i.e., pushing,

hitting, crying) to communicate. Others may feel overwhelmed by not knowing how to initiate a communication action or being uncertain about the right time to join a conversation and, therefore, initiate very awkwardly or not at all. Yet others may not know how to initiate an interaction and depend on an adult to prompt an interaction.

Even the most basic interactions with others involve some form of conversation. Conversations are complex, consisting of multiple aspects such as beginning a dialogue, maintaining a mutual give-and-take, listening, and following the flow of topics, as well as bringing to a close and exiting an interaction. Individuals with AU may have narrow, special interests about which they know many facts. These, however, may not be the most stimulating or interesting pieces of information for a common group of individuals with whom the individual interacts. Therefore, the student with autism may need assistance in determining appropriate topics of conversations and how, when, and for how long to talk about her special interest.

## Unwritten Rules

Child may ...

- Be unaware of the subtle customs within a given environment
- Fail to realize that choices are available if not specifically stated
- Appear oblivious to common-sense routines and occurrences

Individuals with autism spectrum disorders do well when information is spelled out and presented in detail. However, when faced with knowledge that is assumed to be known or is unwritten, they experience problems. This is referred to as the “hidden curriculum” – the unstated dos and don’ts of everyday behavior that everyone but children and youth with Asperger Syndrome seems to know automatically. The hidden curriculum encompasses behaviors, modes of dress, and so on, across situations that most people learn more or less by osmosis and, therefore, take for granted. Every school and every society has a hidden curriculum. Due to its subtlety and changing nature, this unspoken curriculum causes challenges for those with autism. The cost of failing to understand the hidden curriculum is

sometimes no worse than an awkward moment, but other incidents can have more grave consequences, such as being accused of stalking as a result of persistently pursuing a romantic interest despite declined dates and unanswered phone calls.

## **Special or Unique Interests**

Child may ...

- Talk about unusual subjects
- Have a strong preferred special interest
- Mentally play video games out loud
- Converse with self or imaginary figures
- Have difficulty taking the perspective of others

For individuals with autism spectrum disorders, interests can be long-lasting or temporary and can include mundane as well as unusual topics. Self-stimulatory behaviors can seem permanent or be fleeting. It is unknown why special interests or self-stimulatory behaviors develop, but it has been hypothesized that they may be comforting or may be a form of communication.

Often adults try to redirect students with autism spectrum disorders from thinking or talking about their special interests or engaging in their self-stimulatory behaviors because their preoccupation interferes with interacting with potential friends or distracts from completing activities. When strong interests become a detriment to everyday functioning such well-intended behavior from adults may be appropriate. However, it must be kept in mind that research shows that genuine interests and self-stimulatory behaviors also serve as strong motivators for individuals for whom little else serves as a reinforcer.

## Organization

Child may ...

- Have difficulty organizing information and routines
- Prefer structure and sameness
- Need explanations for transition or change in schedule
- Need to be asked one question at a time, eliciting a concrete answer
- Have trouble with planning tasks or breaking down an assignment into parts
- Not be able to organize thoughts or recognize that he needs additional information to complete a given task
- Experience difficulty organizing information on a page; cannot organize thoughts; cannot determine order in which tasks should be done

It is often difficult to understand why individuals with autism spectrum disorders have difficulty with organizational skills. Intuitively, it might seem that individuals with autism, who are literal, focus on small details, and like predictability, would inherently be organized. However, this is not the case.

The root of organizational challenges for children and youth with autism spectrum disorders may be found in the definition of organization: coordinating separate elements into a structure with an implied relationship between separate elements and the coherent whole. When stated this way, the organizational challenges of individuals with autism become more obvious. First, a special challenge related to autism spectrum disorders lies in understanding *what* the relationship is between details and the whole. Second, individuals with autism spectrum disorders have difficulty understanding *how* details can be integrated to create a whole. Third, students with autism spectrum disorders have difficulty understanding assumptions and expectations – *implied* information.

## Daily Living Skills

Child may ...

- Prefer visual directions or instructions instead of verbal ones
- Have difficulty retaining and following verbal instructions
- Need cues for how and when to transition from one activity or place to the next
- Need direct instruction on daily living skills because they are not learned incidentally

Children with autism spectrum disorders often demonstrate a delay in adaptive skills and behaviors – those skills needed for successful day-to-day living and adjusting to the world around them. Adaptive skills and behaviors include a range of domains and functionalities, such as asking a question or requesting help. Another area of adaptive skills includes self-care. Basic hygiene practices, such as brushing teeth or filing fingernails, can be difficult for individuals with autism due to a sensitive sensory system or an inability to learn these skills incidentally. As individuals get older, adaptive skills include talking on the phone, navigating a map, cooking, cleaning, and caring for a home.

It is essential to teach and support the development of adaptive skills and behaviors to foster independence and self-confidence. Due to the core deficits of autism spectrum disorders, many individuals do not absorb or refine daily living skills merely by participating in their environment. Further, due to difficulties in generalizing skills and behaviors, it is important to utilize these skills across environments.

## School Subjects

### School Subjects

Child may ...

- Prefer visual directions or instructions instead of verbal ones
- Find it easier to answer questions given choices versus open-ended options

- Have difficulty organizing information and routines
- Need to be asked one question at a time, eliciting a concrete answer
- Vary in level across domains – excel in one area and have deficits in another
- Be able to work in a general education curriculum without modification or may need a modified functional curriculum
- Not learn from lectures; may need visual lists, icons, and repetition to learn
- Use rote memory to “recite a fact” but have challenges in (a) drawing inferences, (b) sequencing events, (c) understanding and interpreting cause and effect and character motivation, and (d) using prediction and other complex reasoning skills
- Miss presentation of content information because thoughts are elsewhere and being unaware that information has been missed, may fail to seek it out
- Know something in one setting but not another due to failure to generalize

Many academic problems experienced by students with Asperger Syndrome are related to the innate characteristics of their autism spectrum disorder. These are often misunderstood and, as a result, interventions often do not address students’ underlying needs.

## References

In order to make the text flow, for ease of reading, citations were not incorporated into the narrative. Instead, they are listed below.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4<sup>th</sup> ed., text revision). Washington, DC: Author.

Arwood, E. L., & Kaulitz, C. (2007). *Learning with a visual brain in an auditory world: Visual language strategies for individuals with autism spectrum disorders*. Shawnee Mission, KS: Autism Asperger Publishing Company.

Aspy, R., & Grossman, B. G. (2007). *The Ziggurat model: A framework for designing comprehensive interventions for individuals with high-functioning autism and Asperger Syndrome*. Shawnee Mission, KS: Autism Asperger Publishing Company.

Baranek, G. (2002). Efficacy of sensory and motor interventions for children with autism. *Journal of Autism and Developmental Disorders* 32, 397-422.

- Barnhill, G. P. (2001). Social attribution and depression in adolescents with Asperger syndrome. *Focus on Autism and Other Developmental Disabilities, 16*, 46-53.
- Barnhill, G. P., Hagiwara, T., Myles, B. S., Simpson, R. L., Brick, M. L., & Griswold, D. E. (2000). Parent, teacher, and self-report of problem and adaptive behaviors in children and adolescents with Asperger syndrome. *Diagnostic, 25*(2), 147-167.
- Baron-Cohen, S., Golan, O., Wheelwright, S., & Hill, J. J. (2004). *Mind reading: The interactive guide to emotions*. London: Jessica Kingsley.
- Bellini, A., & Akullian, J. (2007). A meta-analysis of video modeling interventions for children and adolescents with autism spectrum disorders. *Exceptional Children, 73*, 264-287.
- Bellini, S., Peters, J. K., Benner, L., & Hopf, A. (2007). A meta-analysis of school-based social skills interventions for children with autism spectrum disorders. *Remedial and Special Education, 28*, 153-162.
- Dunn, W., Myles, B. S., & Orr, S. (2002). Sensory processing issues associated with Asperger syndrome: A preliminary investigation. *The American Journal of Occupational Therapy, 56*(1), 97-102.
- Goddard, L., Howlin, P., Dritschel, B., & Patel, T. (2007). Autobiographical memory and social problem-solving in Asperger Syndrome. *Journal of Autism and Developmental Disorders, 37*, 291-300.
- Golan, O., & Baron-Cohen, S. (2006). Systemizing empathy: Teaching adults with Asperger syndrome or high functioning autism to recognize complex emotions using interactive media. *Development and Psychopathology, 18*, 591-617.
- Green, D., Baird, G., Barnett, A. L., Henderson, L., Huber, J., & Henderson, S. E. (2002). The severity and nature of motor impairment in Asperger's Syndrome: A comparison with specific developmental disorder of motor function. *Journal of Child Psychology and Psychiatry, 43*, 655-668.
- Hale, S., Pexman, P. M., & Glenwright, M. (2007). Priming the meaning of homographs in typically developing children and children with autism. *Journal of Autism and Developmental Disorders, 37*, 329-340.
- Henry, S. A., & Myles, B. S. (2007). *The Comprehensive Autism Planning Systems (CAPS) for individuals with Asperger Syndrome, autism and related disabilities: Integrating best practices throughout the student's day*. Shawnee Mission, KS: Autism Asperger Publishing Company.

- Kana, R. K., Keller, T. A., Cherkassky, V. L., Minshew, N. J., & Just, M. A. (2006). Sentence comprehension in autism: Thinking in pictures with decreased functional connectivity. *Brain, 129*, 2484-2493.
- Killiany, R. J., Moore, T. L., Rehbein, L., & Moss, M. B. (2005). Memory and executive function in autism. In M. Bauman & T. L. Kemper (Eds.), *The neurobiology of autism* (pp. 59-64). Baltimore: John Hopkins University Press.
- Klin, A., Saunier, C. A., Sparrow, S. S., Cicchetti, D. V., Volkmar, F. R., & Lord, C. (2007). Social and communication abilities and disabilities in high functioning individuals with autism spectrum disorders: The Vineland and the ADOS. *Journal of Autism and Developmental Disorders, 37*, 748-759.
- Koshino, H., Carpenter, P. A., Minshew, N. J., Cherkassky, V. L., Keller, T. A., & Just, M. A. (2005). Functional connectivity in fMRI working memory task in high-functioning autism. *Neuroimage, 24*, 810-821.
- Lainhart, J. E., Bigler, E. D., Bocian, M., Coon, H., Dinh, E., Dawson, G., et al. (2006). Do individuals with autism process categories differently? The effect of typicality and development. *Child Development, 77*, 1717-1729.
- Lee, H. J., & Park, H. R. (2007). An integrated literature review on the adaptive behavior of individuals with Asperger Syndrome. *Remedial and Special Education, 28*, 132-139.
- Myles, B. S., Hagiwara, T., Dunn, W., Rinner, L., Reese, M., Huggins, A., & Becker, S. (2004). Sensory issues in children with Asperger Syndrome and autism. *Education and Training in Developmental Disabilities, 3*, 283-290.
- Pfeiffer, B., Kinnealey, M., Reed, C., & Herzberg, G. (2005). Sensory modulation and affective disorders in children and adolescents with Asperger's disorder. *The American Journal of Occupational Therapy, 59*, 335-345.
- Sansosti, F. J., Powell-Smith, K. A., & Kincaid, D. (2004). A research synthesis of social story interventions for children with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 19*(4), 194-204.
- Saunier, C. A., & Klin, A. (2007). Brief report: Social and communication abilities and disabilities in individuals with autism and Asperger Syndrome. *Journal of Autism and Developmental Disorders, 37*, 788-793.
- Schultz, R. T. (2005). Developmental deficits in social perception in autism: The role of the amygdala and fusiform face area. *International Journal of Developmental Neuroscience, 23*, 125-141.

Steele, S. D., Minshew, N. J., Luna, B., & Sweeney, J. A. (2006). Neuropsychologic functioning in children with autism: Further evidence for disordered complex information-processing. *Child Neuropsychology, 12*, 279-298.

Winter-Messiers, M. A., Herr, C. M., Wood, C. E., Brooks, A. P., Gates, M.A.M., Houston, & T. L., Tingsrad, K. I. (2007). How far can Brian ride the Daylight 4449 Express? A strength-based model of Asperger Syndrome based on special interest areas. *Focus on Autism and Other Developmental Disabilities, 22*, 67-79.