

# Chapter 2: Characteristics Associated with Autism Spectrum Disorders

Although every person with autism spectrum disorders is unique, some characteristics are considered to be particularly important in the diagnosis of autism spectrum disorders. These fall into four major categories:

- communication characteristics
- social interaction characteristics
- unusual/challenging behaviour characteristics
- learning characteristics.

Other characteristics of individuals with autism spectrum disorders include:

- unusual patterns of attention
- unusual responses to sensory stimuli
- anxiety.

## Communication

All people with autism spectrum disorders experience language and communication difficulties, although there are considerable differences in language ability among individuals. Some individuals are nonverbal while others have extensive language with deficits in the social use of language. People with autism spectrum disorders may seem caught up in a private world in which communication is unimportant. This is not an intentional action but rather an inability to communicate.

Language difficulties include:<sup>7</sup>

- difficulties with nonverbal communication:
  - inappropriate facial expressions
  - unusual use of gestures
  - lack of eye contact
  - strange body postures
  - lack of mutual or shared focus of attention
- delay in or lack of expressive language skills
- significant differences in oral language, for those who do develop language:
  - odd pitch or intonation

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“The student may be using echolalic utterances to rehearse what is heard in order to process the information, or as a strategy for self-regulation.”

Prizant and Duchan, 1981  
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- faster or slower rate of speech than normal
- unusual rhythm or stress
- monotone or lilting voice quality
- a tendency to use language to have needs met, rather than for social purposes
- repetitive and idiosyncratic speech patterns
- echolalic speech, immediate or delayed literal repetition of the speech of others:
  - appears to be nonmeaningful, but may indicate an attempt to communicate
  - indicates the ability to produce speech and imitate
  - may serve a communication or cognitive purpose for the student<sup>8</sup>
- restricted vocabulary:
  - dominated by nouns
  - often confined to requests or rejections to regulate one’s physical environment
  - limited in social functions
- tendency to perseverate on a topic—that is, to continually discuss one topic and have difficulty changing topics
- difficulty with the pragmatics of conversation:
  - problems initiating communication
  - difficulty using unwritten rules
  - inability to maintain conversation on a topic
  - inappropriate interrupting
  - inflexibility in style of conversation, stereotypic style of speaking.

Students with autism spectrum disorders often have difficulty comprehending verbal information, following long verbal instructions and remembering a sequence of instructions. The comprehension of language may be context-specific. The extent of difficulty varies among individuals, but even those who have normal intelligence, usually referred to as high-functioning, may have difficulty comprehending verbal information.

### **Implications for instruction**

Programs for students with autism spectrum disorders and other Pervasive Developmental Disorders include comprehensive communication assessment and intervention. This involves assessment by a speech-language pathologist as well as informal observation and classroom-based evaluation. Assessment serves as the basis for identifying goals and strategies for facilitating

development of receptive and expressive language skills, particularly pragmatic skills.

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For more on strategies to facilitate the development of communication skills, see pages 60–68.  
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Instruction should emphasize:

- paying attention
- imitating
- comprehension of common words and instructions
- using language for social reasons and not just to have basic needs met
- functional communication.

Communication goals should emphasize the functional use of language and communication in various settings.

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*“One must separate the variables of social interaction problems from emotions. People with autism desire emotional contact with other people but they are stymied by complex social interaction.”*  
Grandin, 1995  
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## Social Interaction

Students with autism spectrum disorders demonstrate qualitative differences in social interaction, and often have difficulty establishing and maintaining relationships. They may have limited social interactions or a rigid way of interacting with others. These difficulties are not a lack of interest or unwillingness to interact with others but rather an inability to distill social information from the social interaction and use appropriate communication skills to respond.<sup>9</sup>

Understanding social situations requires language processing and nonverbal communication, which are often areas of deficit for people with autism spectrum disorders. They may not notice important social cues, e.g., tone of voice, facial expressions. They tend to have difficulty using nonverbal behaviours and gestures in social interaction, e.g., eye contact, body posture, and they may have difficulty reading the nonverbal behaviour of others.<sup>10</sup>

Students with autism spectrum disorders often are not able to understand the perspectives of others, or even understand that other people have perspectives that could be different from their own.<sup>11</sup> They may also have difficulty understanding their own, and other people’s, beliefs, desires, intentions, knowledge and perceptions. They may have problems understanding the connection between mental states and actions. For example, children with autism spectrum disorders may not be able to understand that another child is sad, even if that child is crying, because they are not themselves sad at that particular moment.

Students with autism spectrum disorders have a tendency to play with toys and objects in unusual and stereotypical ways. Some may engage in excessive or inappropriate laughing or giggling. Play often lacks the imaginative qualities of social play. Some children with autism spectrum disorders play near others but do not share and take turns, while others may withdraw entirely from social situations.

The quality and quantity of social interaction occurs on a continuum. Social interaction can be classified into three subtypes<sup>12</sup> along this continuum:

- aloof—those who show no observable interest or concern in interacting with other people except for when necessary to satisfy basic personal needs; they may become agitated when in close proximity to others and may reject unsolicited physical or social contact
- passive—those who do not initiate social approaches but will accept initiations from others
- active—those who will approach for social interaction but do so in an unusual and often inappropriate fashion.

Students with autism spectrum disorders may demonstrate social behaviour that fits into more than one subtype.

### **Implications for instruction**

Social skill development is essential for students with autism spectrum disorders and it is a critical component in developing plans for managing challenging behaviours. Many children with autism spectrum disorders develop social interest but do not possess the social skills necessary to successfully initiate or maintain interactions. Students with autism spectrum disorders have difficulty learning social skills incidentally or by simple observation and participation. It is generally necessary to target specific skills for explicit instruction and provide support to encourage students to consistently use them. The following social skills are generally considered to be critical to social success and should be explicitly taught:

- tolerating others in one's work and play space
- imitating the actions and vocalizations of others
- engaging in parallel activities with others
- sharing materials
- taking turns within the context of a familiar activity
- using eye contact to initiate and maintain interactions.

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For more on strategies to facilitate the development of social interaction skills, see pages 69–78.  
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## Unusual/Challenging Behaviours

Students with autism spectrum disorders often demonstrate unusual, distinctive behaviours, including:

- restricted range of interests and preoccupation with one specific interest or object
- inflexible adherence to a nonfunctional routine
- stereotypic and repetitive motor mannerisms, such as hand flapping, finger flicking, rocking, spinning, walking on tiptoes, spinning objects
- preoccupation with parts of objects
- fascination with movement, such as the spinning of a fan or turning wheels on toys
- insistence on sameness and resistance to change
- unusual responses to sensory stimuli.

In addition, many students with autism spectrum disorders have challenging behaviours, such as aggression, destruction, screaming, self-injurious behaviours and/or tantrums. Given that most individuals with autism spectrum disorders are not able to effectively communicate their thoughts and desires, it is not surprising that they rely on their behaviour to communicate specific messages. For instance, a student may use aggression or destruction to communicate that a task is too difficult. Alternatively, some students may use these behaviours to avoid activities or manage their anxiety. Teachers need to look below the surface to identify the message a student is trying to communicate.

### Implications for instruction

Many of the odd, stereotypical behaviours associated with autism spectrum disorders may be caused by other factors, such as hypersensitivity or hyposensitivity to sensory stimulation, difficulties understanding social situations, difficulties with changes in routine and anxiety. The instructional plan needs to incorporate strategies for:

- expanding students' interests
- developing skills across a variety of functional areas
- helping students monitor their level of arousal or anxiety
- preparing students for planned changes
- facilitating ways to calm down and reduce anxiety.

In planning instruction, teachers need to consider the problematic behaviour and its function for that particular student. Rather than attempting to control or eliminate all changing behaviours, successful teaching strategies often focus on making

environmental adaptations to decrease inappropriate behaviours, and/or helping students learn more appropriate behaviours that will serve the same function (a functional approach to challenging behaviour is discussed in detail in Chapter 6).

## Learning

Students with autism spectrum disorders have psycho-educational profiles that are characterized by uneven patterns of development. Studies indicate that there may be deficits in many cognitive functions, yet not all are affected. In addition, there may be deficits in complex abilities, yet simpler abilities in the same area may be intact. Current research<sup>13</sup> has identified some of the cognitive features commonly associated with autism spectrum disorders, including:

- deficits in paying attention to relevant cues and information, and attending to multiple cues
- receptive and expressive language impairments, particularly the use of language to express abstract concepts
- deficits in concept formation and abstract reasoning
- impairment in social cognition, including deficits in the capacity to share attention and emotion with others, and understand the feelings of others
- inability to plan, organize and solve problems.

Some students have stronger abilities in the areas of rote memory and visual-spatial tasks than they have in other areas. They may actually excel at visual-spatial tasks, such as putting puzzles together, and perform well at spatial, perceptual and matching tasks. Some may be able to recall simple information but have difficulty recalling more complex information.

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*“When I was a child and a teenager, I thought everybody thought in pictures. I had no idea that my thought processes were different.”*

Grandin, 1995  
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Some students can more easily learn and remember information presented in a visual format, and may have problems learning about things that cannot be thought about in pictures.<sup>14</sup>

Students with autism spectrum disorders may have difficulty comprehending oral and written information, for example, following directions or understanding what they read. Yet some higher-functioning individuals are relatively capable of identifying words, applying phonetic skills and knowing word meanings.

Some students demonstrate strength in certain aspects of speech and language, such as sound production, vocabulary and simple grammatical structures, yet have significant difficulty carrying on a conversation, and using speech for social and interactive purposes. Similarly, a student who is high-functioning may perform numerical computations relatively easily but be unable to solve mathematical problems.

### **Implications for instruction**

These cognitive variations result in patterns of strengths and weaknesses in a student's academic performance, social interaction and behaviour. Development of cognitive skills is usually uneven. Education programs should be based on the unique combination of strengths and needs of individual students. Programs may need to be modified on an ongoing basis to ensure they are appropriate.

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For more on visual strategies,  
see pages 39–40.  
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Many students with autism spectrum disorders have deficits in attention and language development, problems with concept formation and difficulties with memory for complex information. These characteristics, considered in combination with personal accounts of how individuals with autism spectrum disorders are visually oriented, suggest that visual material should be incorporated in teaching.

### **Unusual Patterns of Attention**

Students with autism spectrum disorders often demonstrate unusual patterns of attention. These difficulties impact communication, social development and the attainment of academic skills.

Students often have difficulty paying attention to relevant cues or information in their environment and may focus their attention on a certain part of the environment, to the exclusion of what is relevant. For example, a student may look at a ball but not at the person to whom the ball is to be thrown. Or a student may notice insignificant details, such as a staple in the corner of a paper but not the information on the paper. This is referred to as stimulus over-selectivity.<sup>15</sup>

Another feature of this disorder is impairment in the capacity to share attention equally between two things or people. This has been referred to as a problem with shared or joint attention. For example, many individuals with autism spectrum disorders make no attempt to draw the attention of others to objects or events that interest them. Similarly, students with autism spectrum disorders often fail to pay attention to objects or events that interest other people.

Students may have difficulty disengaging and shifting attention from one stimulus to the next, which may contribute to characteristic rigidity and resistance to change. They may also demonstrate short attention spans.

### **Implications for instruction**

Difficulties with attention may significantly interfere with students' abilities to develop effective social behaviour and language. For example, students with autism spectrum disorders may respond to irrelevant social cues that have caught their attention, or attend to limited portions of a conversation and not understand the intent of what is being communicated. They may not attend to multiple cues in speech and language, and miss important subtleties of the message.

Information and instructional activities presented to students should be provided in a format that:

- is clear and concise
- is consistent with students' comprehension levels
- focuses their attention
- emphasizes the most relevant information.

Individualized strategies for focusing students' attention can be developed as part of instructional plans. Parents can provide valuable information about their methods of helping their children focus on things they need to learn. Ideally, instructional plans will include helping students eventually manage these strategies themselves.

## **Unusual Responses to Sensory Stimuli**

People with autism spectrum disorders usually differ from others in their sensory experiences. Responses to sensory stimulation may range from hyposensitivity to hypersensitivity. In some cases, one or more of the person's senses is either under-reactive or over-reactive. Environmental stimuli may be disturbing or even painful to individuals with autism spectrum disorders. This may apply to any or all types of sensory input.

Other characteristics associated with autism spectrum disorders may be caused, in part, by a disorder in sensory processing.<sup>16</sup> The extent to which sensory problems contribute to other characteristics associated with autism spectrum disorders is not certain. However, there is sufficient information to suggest that consideration be given to both the type and amount of sensory stimulation in the environment, and the individual's reaction to it.

## **Tactile system**

The tactile system includes the skin and nervous system. Information is gathered by the skin and nervous system through touch, temperature and pressure. This information is interpreted as pain, neutral information or pleasure. The tactile system allows people to perceive and respond appropriately to their environment. People pull away from something that is too hot. They respond with pleasure to the warmth and pressure of a hug.

When people with autism spectrum disorders are affected in the tactile system, they may withdraw when touched or overreact to the texture of objects, clothing or food. This may be the result of tactile misperception, which can lead to behavioural problems, irritability, withdrawal and isolation. Although some sources of stimulation cause avoidance, other types and/or amounts of stimulation may have a calming effect. Some individuals demonstrate a preoccupation with certain tactile experiences and seek out such feedback on a frequent basis, e.g., insisting on touching smooth surfaces.

## **Auditory system**

People with autism spectrum disorders may be hyposensitive or hypersensitive to sounds. Parents and teachers report that seemingly innocuous sounds can cause extreme responses in some children with autism spectrum disorders. This can be particularly problematic in a school setting, which normally includes many different sounds. The scraping of chairs, bells between classes, intercom announcements and other environmental sounds fill a normal school day. Some people with autism spectrum disorders report that such sounds are excruciatingly intense to them. Alternatively, some individuals with autism spectrum disorders fail to respond to certain sounds, e.g., their name being called, the phone ringing.

## **Visual and olfactory systems**

People with autism spectrum disorders may respond differently to sensory stimuli. Some individuals react to odours, such as perfumes and deodorants. Others may use smell to seek out information about the surroundings in unusual ways.

Some people with autism spectrum disorders cover their eyes to avoid certain lighting, or in response to reflections or shiny objects. Others seek out shiny objects and look at them for extended periods of time.

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*“As I walk down the street, I know what everyone is having for dinner by the smells coming from the houses.”*

A 14-year-old boy with Asperger’s syndrome  
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## **Vestibular and proprioceptive systems**

The inner ear contains structures that detect movement and changes in position. This is how people can tell that their heads are upright, even with closed eyes. People with autism spectrum disorders may have differences in this vestibular orienting system so that they are fearful of movement and have trouble orienting themselves on stairs or ramps. They may seem strangely fearful or clumsy. The opposite is also true. Individuals may actively seek intense movement that upsets the vestibular system, such as whirling, spinning or other movements that others cannot tolerate.

Through information derived from muscles and other body parts, people automatically know how to move or adjust positions efficiently and smoothly. Some individuals with autism spectrum disorders have problems integrating the body's proprioceptive information, and have odd posture and appear clumsy or sloppy.

## **Implications for instruction**

These unpleasant or aversive sensory experiences contribute to some of the inappropriate behaviours students with autism spectrum disorders display.<sup>17</sup> For example, students with severe sensory processing problems may shut down entirely to avoid aversive stimuli or over-stimulation.<sup>18</sup> Tantrums may be related to the desire to escape situations that are over-stimulating. Self-stimulating behaviours may help individuals calm down when stimuli become overwhelming, by generating a self-controlled, repetitive stimulus.<sup>19</sup>

Being aware of the different experiences of sensory stimulation and integration is an important part of understanding the behaviours of students with autism spectrum disorders and planning programs for them.

## **Anxiety**

Anxiety is not specifically identified in the *DSM-IV* criteria for autism spectrum disorders. However, many individuals with autism spectrum disorders, as well as their parents and teachers, identify anxiety as a characteristic associated with the disorder. This anxiety may be caused by a variety of sources, including:

- the inability to express oneself
- difficulties with processing sensory information
- fearing sources of sensory stimulation
- a high need for predictability and difficulty with change and transitions
- difficulty understanding social expectations
- fearing situations because they are not understood.

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For more on strategies that can be utilized to address sensory issues, see pages 54–59.  
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### **Implications for instruction**

Programming for students with autism spectrum disorders often need to address anxiety and the factors that appear to contribute to it. Changes and adaptations can be made within the environment to reduce anxiety arousing situations, and a variety of strategies can be used to help students manage anxiety and cope with difficult situations. These include:

- providing warnings about upcoming transitions and changes
- providing daily and weekly schedules to increase predictability
- utilizing social scripts to encourage appropriate calming strategies or coping skills
- providing factual information regarding fear or anxiety arousing situations, e.g., what to do when lost
- establishing a calming area within the classroom.

### **Final Thoughts on Characteristics**

The differences in learning characteristics associated with autism spectrum disorders that have been described in this chapter clearly have important implications for instruction across all developmental domains and subject areas. In general, these differences necessitate primary reliance on systematic and explicit (direct) instruction. In essence, students with autism spectrum disorders require a very high level of structure in the presentation of materials, organization of the learning environment and instructional methods. However, while direct instruction should be the primary tool used with students with autism spectrum disorders, it is important for teachers to be flexible in their approach and to change expectations when the situation warrants it. Achieving a balance between the need for carefully planned instruction and flexibility in adapting approaches based on the students' changing needs is the key to a successful program.

