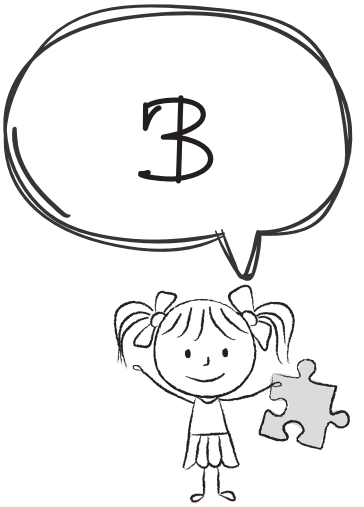


What Are the Social Communication Symptoms of Autism Spectrum Disorder, and How Are They Evaluated and Treated?

We've talked a great deal about the typical course of development of many of the characteristics that serve as signs of autism, and what goes into diagnosing children with ASD. Two major classes of symptoms have been identified: 1) social communication and 2) restrictive, repetitive patterns of interest and behavior. Although both types of symptoms need to be present in order to make a diagnosis, this chapter focuses on the first set of symptoms, those that have to do with social-communication, interaction, and language, because these are the symptoms that will generally receive the most effort on the part of your intervention team, the symptoms you will be most involved in addressing, and the ones that can be coaxed into helping the child achieve the best level of function. Let's first review what these social communication symptoms look like in young children.

WHAT WILL THE TEAM LOOK FOR WHEN EVALUATING A CHILD?

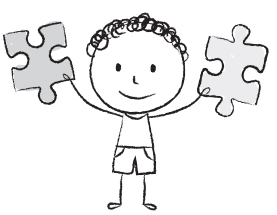
An educational team will look for two things in an assessment for child suspected of ASD. First, they will look for the level of development a child is showing, relative to age, in the major areas of development such as language, problem-solving, motor, and adaptive skills. They will use a range of standard tests and parent-report instruments to gather this information. Second, they will look for symptoms of ASD: the social-communication and restrictive, repetitive behaviors that

are core to the syndrome (see Boxes 3.1 and 3.2). As they did with the developmental measures, the team will gain some of the information from direct testing and observing your child and some from asking you to complete questionnaires or participate in interviews to get a fuller picture of your child's profile.

Social Symptoms

Social symptoms are nonverbal behaviors that often lead parents to worry about their child's development before the child starts talking. They include

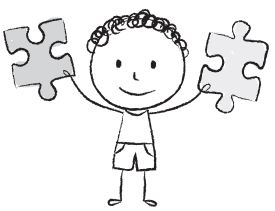
- Reduced tendency to look and smile at others
- Reduced likelihood to imitate others' actions, as in play with toys
- Reduced participation and enjoyment in infant games, such as Peekaboo
- Reduced babbling, especially back-and-forth babbling with others
- Increased and long-lasting use of unusual sounds
- Reduced use of gestures, especially pointing, to get others to pay attention or do something; also reduced ability to follow others' gestures, such as difficulty looking toward where others point
- Reduced interest in other people's talk; delayed response to hearing name
- Reduced interest in sharing things and experiences with others; lack of showing objects
- Reduced ability to follow others' attention to objects (responding to joint attention) or signal others to share attention to an object of interest to the child (initiating joint attention)
- Limited initiation of communication, except to get things or help
- Unusual social initiations, such as licking or smelling others
- Using others as tools by grabbing their hand or arm to take them to something the child wants without looking at their face
- Limited interest in sharing enjoyment with others by looking at them with warm facial expressions or finding pleasure in being with others; limited responses to praise or attention from others
- Failure to learn to play with toys as others do, in functional ways (e.g., lining up blocks in a row instead of building a tower)
- Failure to develop pretend play (e.g., persisting in exploring objects' shapes and textures rather than pretending the object is something else)
- Preference for solitary activities; failure to notice other children



Language/Communication Symptoms

Language/communication symptoms are usually noticed when other children begin talking; parents become concerned because the child appears delayed in acquiring speech.

- Delayed acquisition of spoken language; slow to acquire first words and sentences
- Inability to follow simple instructions or respond to name
- Immediate or delayed echolalia
- Unusual rhythm, melody, or intonation in speech
- Reversing pronouns ("Pick you up" instead of "Pick me up") for a long period of time
- Verbal rituals; repeatedly having to say or hear the exact same words the same way
- Speech that sounds too stiff and grown up for the young child, who may sound like a "little professor"



Apart from helping make a diagnosis of ASD, the assessment of social-communication symptoms, especially, helps the team identify where your child is showing strengths in interacting with others, identify targets, and prioritize needs in an intervention program. Let's look at the social-communication assessment in more detail to show how it helps the team to develop an educational plan for a child with ASD.

What Does a Communication Assessment Look Like?

As we've said, there isn't a single, simple test for ASD the way there are IQ tests to identify ID or blood tests to identify diabetes. ASD is identified by observation and history of the symptoms that characterize the disorder. This is made difficult because many of the symptoms of ASD are made up of the absence of or reduction in behaviors that are usually seen, such as the lack of a social smile or a reduced number of attempts to initiate communication. That's why using both direct observation and parent report are so important—to make sure that if a behavior is not seen in a particular assessment session, then its absence is typical of the child and not just an unusual occurrence because the assessment setting is unfamiliar.

There isn't a single, simple test for ASD the way there are IQ tests to identify ID or blood tests to identify diabetes. ASD is identified by observation and history of the symptoms that characterize the disorder.

Setting up situations when the behavior usually would occur and seeing if and how often a child shows it is another way assessment teams try to compensate for the need to show a behavior is not part of the child's repertoire. Barry Prizant, Amy Wetherby, and their colleagues (1997) called this method *communication temptations.* They might, for example, put a treat the child likes inside a big plastic jar with a screw-on lid the child can't open, hand the child the jar, and wait to see whether the child will request help from another person in some way. If so, observers can note not only that the child sought help, but also how the need for help was demonstrated (e.g., speech, gestures, eye contact, a combination of both). Presenting a range of these temptations in an assessment can help the team learn a lot about whether and how a child communicates.

Several assessment instruments that structure these observations are available. The ADOS (Lord et al. 2012) includes a variety of temptations, called *presses* by its authors, to attempt to elicit social-communication behaviors appropriate for children at a range of developmental levels. The Communication and Symbolic Behavior Scales (CSBS-DP; Wetherby & Prizant, 2003), which also involves naturalistic procedures and communication temptations, is another measure often used by SLPs. Instruments like these are designed to find out what a child can and cannot do in terms of social-communication so that strengths can be built on and weaknesses addressed. They also allow a score to be calculated with information across several areas of assessment (e.g., expressive language, receptive language, nonverbal communication). The score can be used to compare the child being assessed with other children who took the test to determine whether the child meets a threshold for autism or shows patterns of scores that differ from what is seen in typically developing children. The ADOS was developed as a diagnostic instrument, so its score is generally compared with a cutoff score that indicates a diagnosis of autism. The CSBS-DP, however, was developed not so much to identify autism as to measure the child's strengths and needs across several areas of social-communication. As such, it is more often used for intervention planning with a child who has already been diagnosed.

So in addition to standardized tests of cognition, language, motor and daily living skills, the assessment of a young child suspected of ASD will usually include an evaluation of strengths and needs in social-communication using a combination of direct observation on a scale designed like the ones just described to tempt the child to display key social-communicative behaviors and information from parents on similar behaviors to make sure that what the team sees in the session is a valid picture of the child's usual behavior.

In addition to standardized tests of cognition, language, and daily living skills, the assessment of a young child suspected of ASD will usually include an evaluation of strengths and needs in social-communication using a combination of direct observation on a scale designed to tempt the child to display key social-communicative behaviors and information from parents on similar behaviors to make sure that what the team sees in the session is a valid picture of the child's usual behavior.

If you have a young child diagnosed with ASD, then you probably went through some months of noticing things about your child's development that were different from what you saw in other children, hoping you were worrying too much and that the child would grow out of it, wondering if you should take the child to see someone, feeling guilty that you hadn't done it sooner, and a whole host of other thoughts and concerns. This is a perfectly natural series of feelings to experience, and many times children do grow out of minor oddities or apparent delays in their first few years. A difference of 6 or 10 months in the age at which a child is diagnosed and begins intervention won't make an enormous difference in long-term outcome. Lilly's story gives us an idea of how this worked in one family.

When Lilly was 14 months old, her parents noticed that although she babbled, she made some funny sounds and often hummed the sounds of her favorite cartoons. She was observed to smile at her parents and grandparents, but she did not seem to be very interested when they would try to get her to imitate them or play games such as Peekaboo. When her parents called her name, she often would not look at them, and they also noticed that she used unusual means of communicating her needs; often pulling the adult's hand to the item she wanted rather than looking at faces and pointing to the object. At about this time, one of Lilly's cousins was diagnosed with ASD at the age of 2 1/2. Lilly's parents began reading about ASD and found out that it tends to run in families. Still, they hesitated to get Lilly assessed. She was so little, what could the testers possibly do? Even if they decided something was wrong, what kind of treatment could there be for a 1-year-old child? They decided to wait and see how things went and hope for the best.

By the time Lilly was 21 months old, all the other toddlers in her playgroup were talking and playing nicely with toys. Lilly still had only two or three words and preferred to be by herself, even during playgroup time. She spent as much time as she was allowed spinning tops or turning toy cars upside down and spinning their wheels around and around as she closely watched them. She did love music, though, and would sit down with the other children when one of the moms led them in a song. Her parents' concern had not lessened, though, seeing her with other children her age, and they decided to schedule her 24-month checkup with her pediatrician early and ask him about her behavior. When they mentioned their concerns, he had them fill out a screening questionnaire for ASD, and they were told that Lilly's score placed her at risk for the disorder. The doctor referred them to a local early assessment agency, and the family reluctantly decided to have Lilly assessed.

Once Lilly's family had their concerns confirmed by means of the screening questionnaire, they were able to gain access to assessment services through the public birth-to-3 system. Let's look at what is likely to happen when they meet Lilly's assessment team.

WHAT TESTS WILL BE USED TO ASSESS MY CHILD?

Part of your child's assessment will consist of tests and measures to determine where in the sequence of development the child is functioning. Since some children with ASD have age-appropriate skills in some areas and not others, the team will want to identify these areas of strength and weakness. There are several kinds of assessment instruments that can be used in this process. We'll describe them for you here.

Standardized Tests

The standardized test is probably most familiar kind of assessment instrument. It is a procedure developed to compare a child's performance with that of other children the same age in order to decide whether the child's performance falls within the normal range. *Normal range* is usually defined as the middle range of scores of children who were part of the test's norming sample, a large group of children, usually at least 100 in each age group, who were given the test as part of its development. The normal range consists of scores that are not the very top scores or the very lowest; usually they are the middle 80%–95% of the scores (it varies a bit form test to test). So, if a child scores in the top 2%–3% of scores, then that score is not considered within the normal range, although it's not usually one to worry about because it is a better score than most children got. Concerns arise for children who score near the bottom of the test's score range, usually the bottom 10%, or sometimes the bottom 2%. Your team may use this kind of score to report your child's performance on a test. If your child got a score at the 9th percentile, for example, then it means that 9% of the children in the norming sample got the same score or lower than your child.

Standardized tests often are used to decide if a child's performance is outside the normal range in a particular area in order to identify a meaningful difference from typical development. IQ tests are one example of standardized tests and are designed to examine the development of a child's cognitive or intellectual abilities—those involved in solving problems (e.g., what to do if you cut yourself), finding and extending patterns, and recognizing similarities and differences. They yield a *quotient* score that reflects how a child does relative to other typical children the same age. Quotient scores are usually measured on a scale in which 100 is the average score for children of a given age, and 96% of children have scores between 70 and 130. The 70–130 range is usually considered normal for an IQ test. Children who score below 70 (below the 2nd percentile) are considered significantly below the norm in intellectual functioning. IQ tests are used for a variety of purposes, but one is to help identify children with significant ID, formerly called *mental*

Standardized tests often are used to decide if a child's performance is outside the normal range in a particular area in order to identify a meaningful difference from typical development.

retardation. Because they also identify children who score significantly higher than normal (e.g., above 130), IQ tests are also used as part of the identification process for children who are gifted.

IQ tests used to assess children with autism and other disabilities often have several different scales. The most common types are scales that separate verbal abilities (e.g., being able to say and understand words and verbally presented material) from nonverbal (e.g., the ability to recognize and interpret visual patterns without naming or describing them). A motor scale is often included in these tests for very young children because so much early development involves learning how to walk, jump, draw, and use utensils. Many children with ASD score much worse in verbal areas than they do on nonverbal or motor scales. These differences can be a good sign because several studies have found that children who do better on nonlanguage testing in the early years tend to have a better prognosis than those who score low on all scales (Eaves & Ho, 2004). It is important to remember that most standardized tests of this kind are not considered stable until a child is 4 or 5 years old. That means that if children are tested at 2 or 3 years old, as children undergoing assessment for ASD often are, then their scores are likely to change over the next several years. A low score on a test of intellectual ability in the early years does not necessarily mean the score will always be that low. But it does mean that the child is delayed in the tested area *now*, and it is important to provide the child with help to learn the skills that are lagging.

In addition to IQ tests, tests of language function often are used in developmental assessments of children with ASD. Although IQ tests may contain verbal scales, these scales give only a general picture of the level of a child's use of language in comparison with typically developing children. More detailed information often is needed in order to develop an intervention program that builds on the child's current strengths and addresses weaknesses. For this reason, children are often given a standardized language test, such as the Peabody Picture Vocabulary Test (PPVT) or the Preschool Language Scale (PLS) as part of an assessment for ASD. These tests help the team to find out whether the child understands more than he or she is saying, whether he or she knows quite a few words but is not putting them together to form sentences, and what kind of errors the child makes in pronouncing words, forming grammatical sentences, or choosing words to express ideas. Scores from language tests typically are used to establish the child's current (baseline) level of language function, to compare this with functioning after some intervention has taken place, and to pinpoint the areas where the child is ready to learn new language skills that can be addressed in a therapy program.

Scores on standardized tests can be useful for the reasons discussed. They don't diagnose ASD, though. They assess certain aspects of development, but not the core symptoms of ASD. Instruments specially designed to look for those core symptoms are needed in order to make the diagnosis (See Chapter 2). These measures are not standardized tests because they do not yield a score that

is directly compared with the scores of typically developing children. Instead, they often are what is called *criterion-referenced measures,* meaning that they identify certain criteria (e.g., Does the child initiate joint attention? Does the child have repetitive behaviors?) and assess whether the child meets each criterion. The ADOS (Lord et al., 2012) is an example of a criterion-referenced measure.

Criterion-referenced language measures are often used to assess the communication skills of children who are not yet talking.

Criterion-Referenced Tests

Criterion-referenced language measures often are used to assess the communication skills of children who are not yet talking. Some language tests can be used with preverbal children to learn how many words they understand (e.g., the PPVT) or whether they can follow simple instructions (e.g., PLS). Criterion-referenced measures are more useful, however, to find out how often (frequency), for what reason (function), and how (form) a child accomplishes communication. For example, the rate of communicative actions exhibited by a child suspected with ASD can be observed and compared with those seen in typically developing children under the same conditions.

Many tasks on criterion-referenced measures for this purpose involve temptations. For example, an attractive toy may be shown, then hidden, and the clinician tempts the child to ask for it. A child may be offered a bag of toys and invited to pull one from the bag in order to observe whether he or she will share the toy or initiate joint attention to it with the adults in the room. When children are not yet talking, assessors look for other means of communication. Some may be adaptive, such as using a gesture to request a hidden toy, making a sound to call an adult's attention to a toy, or looking at the adult for help with a closed jar. Sometimes, though, children will use less adaptive ways to communicate their needs. A little boy may bang his head on the table when he cannot obtain a toy he wants. A little girl may begin turning around in circles when she cannot open a jar. These behaviors also send a message and are considered communicative, but they do so in a maladaptive, unusual way. Still, they are an important part of the assessment because they tell the team how often these kinds of behaviors occur and what thoughts they communicate.

Replacing these maladaptive behaviors with more appropriate ways to communicate is one of the first goals the team may set. The assessment will also show the team what ideas the child is trying to get across with means other than speech, such as gestures, gaze, and sounds. For the communicative acts the child is already expressing with gestures, gaze, and sounds, the team may target early words, signs, or pictures to communicate these ideas in a more mature way. For communicative functions that the child does not yet express at all, or very infrequently, the target may be to get the child to express these ideas nonverbally, with gestures, gaze, and sounds first, before moving on to more symbolic means of expression.

Play Assessment Play is another area that often is explored with criterion-referenced assessment. Children with ASD often do not play the way other children do, focusing more on exploring objects and using them in repetitive ways (see Chapter 2). Assessments of play for children suspected of ASD usually consist of giving them opportunities to use play with objects that encourage functional use and pretend, observing how the children use the objects, providing a model of functional or pretend use, and observing whether the child follows the adult's example.

This kind of assessment has two purposes. One is simply to see how the child plays and uses toys because children with ASD often use toys in particular, unusual ways. The other is because using objects in play is related to using words to communicate. Researchers have known for years that typically developing children who show more symbolic or pretend play tend to have more spoken language because, as we've discussed, using toys as symbols involves the same mental processes as using a word to stand for an idea. Both pretending and using words involve symbolic thought—the ability to hold a thought in mind and express it out into the world. These two kinds of behavior—pretending and language—usually go together in typical development. But for some children with disabilities, one form of symbolic behavior may be ahead of the other. If this is true for your child, then the assessment team will want to know because if play skills are ahead of the child's language level, then it suggests the child is more ready to learn language than if both are similarly delayed. Play assessment will not only help the team describe your child's level of function, but will also help to decide if the child is ready to learn a symbolic communication system, such as speech or sign, or needs to spend more time developing play and preverbal communication skills before focusing on symbolic communication. To show you how this assessment information can be used, here are some of the things that happened at Lilly's assessment when she was nearly 2 years old.

Lilly's parents reported she was saying five or six different words and doing a lot of babbling. The team did an ADOS (Lord et al., 2012). They also used a Mullen Scales of Early Learning to assess her verbal, visual (nonverbal), and motor skills. They used the CSBS-DP (Wetherby & Prizant, 2003) to get a closer look at her communication. Lilly's parents had informed the team that Lilly loves bubbles and the Moomins. They put a Moomins book in a clear box to tempt Lilly and see how she would respond. As soon as Lilly saw the box she shrieked with joy, "Moo-Meens piz!" Lilly also enjoys puzzles, and she completed an inset puzzle soon after she received it. She also likes banging the puzzle pieces together by her ear and spinning them.

The team met with Lilly's parents and reported that the ADOS (Lord et al., 2012) showed Lilly scored within the range seen in children with ASD. The Mullen showed her motor and visual skills were at age level, but her verbal skills were delayed in both expression and comprehension. The CSBS-DP (Wetherby & Prizant, 2003) showed that Lilly was requesting things in almost all the temptation situations presented, using sounds and

her few words, but she hardly ever communicated for reasons other than making requests. Her play skills were observed to consist mostly of turning toys over to look closely at their shape or banging them together to hear the sound they made. Even after modeling feeding a stuffed toy with a spoon, Lilly did not show any pretend feeding. The team recommended that she begin intervention and that one of her goals would be to learn more words for making requests; another to use gestures, gaze, and sounds to communicate for joint attention, as well as to work on imitating others and using toys in pretend ways.

WHY WOULD A CHILD WHO IS NOT TALKING NEED TO SEE A SPEECH-LANGUAGE PATHOLOGIST (SLP)?

Social-communication symptoms are very prominent in diagnosing ASD and are the primary focus of intervention efforts. Many professionals will be involved in this effort, but you may be especially puzzled about the involvement of the SLP if your child is not yet talking. There are two reasons for this. First, the SLP is responsible for doing the criterion-referenced assessment that looks at how your child communicates—how often he or she tries to get ideas across, for what purposes, and in what way. Second, many children who do not talk can be helped by having a symbolic way to communicate that does not use speech and so does not require the high level of motor coordination and imitation skills that are needed for talking. Let's take a look at how this might work.

Juan is a 3-year-old boy who was diagnosed with autism at the age of 28 months. He has been receiving home-based intervention since then. Juan occasionally echoed parts of words after an adult but did not use words to ask for things or interact with others. His mother, Maria, tried very hard to understand his nonverbal ways of communicating, but, more often than not, this resulted in a guessing game that ended in frustration and tears for both. If Juan wanted something and could not reach it himself, then he either pulled an adult by the hand toward what he wanted or he screamed and cried until someone figured out what he was after.

Maria spoke with their SLP to explain how she had repeatedly tried to teach Juan spoken words. For example, when she knew Juan wanted to drink water, she asked him to repeat the word *water,* but he didn't say anything and just became more upset; this often ended with a tantrum. Maria reported that she felt frustrated and sad about the difficulty communicating with her son. The SLP explained that talking

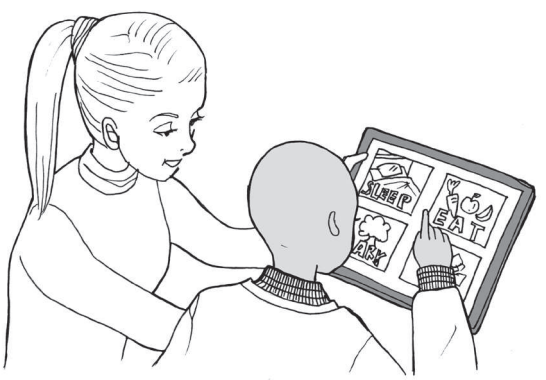
can be difficult for children with autism and asking Juan to repeat words at this stage can be frustrating for everyone. Juan may only learn from it that no one can meet his needs unless he screams, and screaming will eventually get him what he wants. The SLP recommended teaching Juan a few signs as a stepping stone toward acquiring verbal language. Although Maria was willing to try this strategy, she's worried—"Aren't signs or gestures only used with children who are deaf? Does deciding to teach Juan signs mean the SLP thinks Juan will never speak? Will using signs discourage him from learning to talk?"

Most children with ASD do develop spoken language, although it may take them until they are 5 or 6 years old. It can be helpful to have an alternative way to communicate that allows the child to express wants and needs during the time when speech is limited. *Augmentative or alternative communication* (AAC) is the term used to describe these methods. Just as there are many ways to get from one place to another (e.g., on foot; by bike, car, train, or plane), there is more than one way for a child to communicate. The team's job is to find the most efficient means of allowing the child to successfully express needs now in order to learn that there is an adaptive way to get messages across. That understanding may be helpful in acquiring speech.

Most children with ASD do develop spoken language, although it may take them until they are 5 or 6 years old. It can be helpful to have an alternative way to communicate that allows children with ASD to express wants and needs during the time they have very limited speech. ***Augmentative or alternative communication*** (AAC) is the term used to describe these methods.

It is usually an SLP who evaluates the child's readiness and need for an AAC system, chooses the most appropriate AAC method for the particular child, and teaches the child to use it. AAC systems can be either unaided (e.g., gestures, signs) or aided (e.g., using other tools such as pictures, switches, devices specially designed to reproduce speech, or speech-generating software on consumer electronic platforms, such as iPads).

Many young children who are preverbal start out with signs because signs can easily be modelled, physically prompted, and shaped. Consumer electronic platforms are also quite accessible for young children, however, and also may be helpful. The main point of an AAC system is not what type is used, but that the system provides a more flexible, conventional way to express wants and needs for the child. In this way, AAC can build toward the ability to communicate a wider range of meanings than



nonsymbolic gestures or vocalizations can achieve. Either speech or an AAC system can help the child take the crucial first step from communication to language. Box 3.3 contains an example of an approach that has been used to teach first signs to preverbal young children with ASD. Let's see how this worked for Juan and his family.

Five Steps in the SET GO Program for Teaching Signs (Fahim, 2011)

S: Select activities and items the child enjoys.

E: Establish a positive rapport.

T: Teach the child to request.

G: Give reasons to use targeted signs by contriving situations.

O: Omit and reduce prompts as child becomes more independent.

Step 1: *Select targeted activities or items.* Create a short list of targeted activities and items the child enjoys. Identify three or four activities and items for which the child will learn the signs.

Step 2: *Establish positive rapport.* Help the child understand that other people can make fun things happen. Engage in activities the child enjoys and find ways to share them. For example, hold the child's hands and sing in rhythm as he or she jumps on a toy trampoline.

Step 3: *Teach how to request using signs.* Use consistent, simple verbal prompt phrases ("What do you want?") as well as physical prompts, and then name the item or action with a sign. For example, provide a closed jar with a treat in it, model the sign for OPEN, physically guide the child to produce the sign OPEN, then open the jar and provide the treat.

Step 4: *Give reasons to sign.* Set up situations in which the child can practice the signs throughout the day; have items from each meal and snack in closed containers so the child must use a sign to request that adults open the container.

Step 5: *Omit or reduce prompts.* Wait before prompting, allowing the child time to produce the sign him- or herself. If he or she doesn't produce the sign, then provide a very small prompt, such as touching his or her hands instead of shaping them fully into the sign for OPEN.

Initial attempts to get Juan to use signs to ask for things he wanted resulted in his running away. For example, when presented with a bubble jar, he showed that he wanted bubbles blown for him, but when the SLP demanded he make a sign for BUBBLE, he would look for something else he could get without having to do anything to get it. Maria was concerned, "Is this going to work? He's all over the place and doesn't stay still for a second."

The SLP started off by playing with Juan on the trampoline to establish positive rapport with him. She held his hands, and while he jumped, she simultaneously labeled his action, "Juan's jumping. Jump, Jump, Jump." After 1–2 minutes of jumping, the SLP then started to use sentence completion, "Ready, set . . . ," pausing and waiting for Juan to look at her before she would say "go." The SLP introduced the bubbles after she had Juan's interest. She blew bubbles and simultaneously said and signed BUBBLES in between jumping, which made Juan laugh as he tried catching the bubbles. After doing this a few times, the SLP paused the bubble blowing and said, "Give me five," and then placed her palm out in front of Juan's to give him the opportunity to slap her palm with his palm. As soon as Juan tapped her palm with his hand, she immediately blew the bubbles again.

The SLP showed Maria how to teach Juan the sign for OPEN, which was selected because it can be used for many different requests and situations (e.g., open door, open cookies, open box). Maria held the bubbles in front of Juan and said, "What do you want? Open!" Maria then took Juan's hands, helped him make the sign for OPEN, and then immediately opened the bubble jar and blew bubbles. Because Maria reported that Juan also enjoyed music, the SLP showed her how to prompt Juan to use the sign for MUSIC. Maria first held Juan's hands while he jumped on the trampoline, then, just as the SLP had done, they sat down in between jumping, and Maria gave Juan the musical toy and started to sing a song. Maria then used the same physical and verbal prompts as the SLP. "What do you want? Music!" Juan was willing to allow his mother to help him, and he signed MUSIC.

Together, Maria and the SLP selected four signs representing things Juan most frequently wanted, which included EAT, MUSIC, BUBBLES, and OPEN. The SLP helped Maria think of ways to encourage Juan to use the signs to have his needs met throughout the day. For example, Juan was asked to use the sign for EAT any time he wanted to eat. Juan was asked to use the sign for JUMP whenever he wanted to jump.

Maria and the SLP practiced using the signs for the next 2 weeks. By the end of that time, Juan used the sign for EAT three times, with an imitative prompt and echoed part of the word *ee*. He used the sign for MUSIC with both a partial physical and verbal prompt, and he used the sign for OPEN with a physical and verbal prompt.

Maria told the team, "I was skeptical when the SLP wanted to try signs, but getting him to use them has really helped his behavior. He's calmer and doesn't get upset when he has to wait. He uses the signs for EAT, MUSIC, and sometimes OPEN now. He has also started to make sounds when he signs for EAT. My aunt and his older sister have also learned the signs. Even the man in our local shop has started to sign THANK YOU with Juan."

HOW DO CHILDREN MAKE THE TRANSITION FROM COMMUNICATION TO LANGUAGE?

Many parents are concerned that if an alternative system, such as signs or computer-generated speech, is introduced, then the child will rely too heavily on the alternative method and never learn to speak. A lot of research looked into this question and generally found that using an alternative system does not seem to keep children from learning to talk. Some studies showed that children who are preverbal who begin using AAC systems have some advantage in acquiring speech (Kasari et al., 2014). It's thought that the AAC system helps children with ASD understand a basic concept about communication that their autism kept them from understanding before—that it is possible to influence others and get what we want by using symbols and sending messages instead of by physically manipulating people. AAC systems seem to help some children with ASD to the "Aha!" moment when they realize, "If I say (or express in some way) something, then others do something. I don't need to drag them by the hand to what I want and hope they get what I need them to do with it. I can use this word/sign/picture to get what I want and they get the message. So that's why everybody has been making those noises with their mouths all this time!" Once this moment is reached, children have a more powerful reason to learn to speak than just doing what others are doing.

An alternative system does not seem to keep children from learning to talk.

Typically developing children seem to have a strong drive to become and act like others around them. That's why their play often involves imitating what others do, and it's one of their motivations for acquiring speech. But part of having ASD is having less motivation in this direction. Learning to talk just to be like others is not a powerful enough reason for children with ASD to go to the trouble of acquiring speech. Acquiring speech is hard! You have to listen carefully to what others say, follow what they look at while they say it to figure out how the words relate to things in the world, chop up the stream of sounds into separate words, create some kind of mental representation or trace of the words to serve as a target for what you want to say, somehow store this memory in your mind so you can find it again when you want it, make very fine motor movements in order to recreate the sounds you've stored in your mind, and adjust those movements minutely to make your sounds match the speech of other speakers in your environment in all the subtle ways that make speech sound right.

Typically developing children seem to have a strong drive to become and act like others around them. That's why their play often involves imitating what others do, and it's one of their motivations for acquiring speech. But part of having ASD is having less motivation in this direction.

If you ever taught baby signs to any of your typically developing children, then you may have noticed that they were able to produce quite a few baby signs

before they could talk. That's because the motor skills necessary to form signs with the hands are easier and less precise than the motor skills needed to form the sounds of speech. Of course, you can shape the infant's hands with yours, so the target can be corrected if the child doesn't get it quite right. You may also have seen that knowing baby signs did not stop your infant from learning to talk, and that the signs easily fell away once speech became available. Although the transition may not be quite so natural for children with ASD, there is no evidence that using an AAC system will keep them from acquiring speech.

It is important to understand that some children with ASD do not acquire speech; current estimates suggest this is true for 10%–30% of affected children. The great majority of children with ASD who are going to talk will do so by age 6. The chances that speech will emerge are much less after that age, although it's not impossible. Pickett, Pulara, O'Grady, and Barry (2009) found 167 reported cases of children with ASD who acquired speech between 5 and 13 years old, and there are surely other cases that have not been reported. It is not known why some children with ASD don't acquire speech. It may have to do with the precision of motor skills necessary to produce it. It may involve difficulty in making sense of or remembering the auditory signals that carry speech information so that the child is unable to establish a stable mental representation, or auditory image, of words in mind and cannot reproduce them through speech. It may be that some children with ASD never reach the "Aha!" moment that allows them to understand the purpose of speech. An AAC system that allows these children to express a range of messages is especially important. It will be the job of the SLP to

- Assess the child and family's need for an AAC system
- Choose an AAC system appropriate for the child and acceptable to the family
- Help the child and family learn to use the AAC system while continuing to emphasize, encourage, and practice speech

Each component of the SLP's job with AAC includes the family because communication is always a two-way street. Children need a way to express themselves, but adults also need to understand and validate the child's form of communication. If the child is using signs as an AAC mode, then that means that people in the family and people in the neighborhood, as in Juan's case, need to know how and be willing to use the communication system along with the child. A child won't have as much success with a communication system that isn't embraced by others. Many AAC clinicians suggest that the family not only respond to AAC communication that the child produces, but also that they use the system themselves—signing when they talk to the child who signs, using pictures to accompany their speech for a child who uses pictures, or sending their messages on the iPad for a child who uses an iPad. The AAC's value will be enhanced when it is seen as an interactive exchange rather than a mechanical tool only the child uses.

Young children who adopt an AAC system should still receive some structured therapy to encourage speech. For example, the SLP may spend some time working with the child and family on using the AAC device and on teaching others in the child's world to use it, but also spend part of the time on activities that focus on speech. Speech is the most difficult form of communication to learn, and the brain is finely tuned to learn it only during the early years. It's that special talent for learning speech that is lost with age, which makes it so hard to acquire a foreign language and its unique accent once childhood has passed. If children with ASD are going to talk, then it is most likely that they will do so by the time they are 6 years old. If they don't learn by then, then their chances of acquiring speech are much reduced. Even though using an AAC system doesn't prevent a child from talking, children with ASD still need some special help in learning to do what other children do completely naturally and without effort, and talking is one of those things.

Some special techniques are needed to teach speech to children with ASD. Several methods have shown some success in getting preschoolers who are preverbal and have ASD to talk, and they will be briefly mentioned next. See Chapters 6 and 7 for more information about these methods.

ABA or discrete trial instruction (DTI) is the most common method for teaching speech to children with ASD. DTI uses a stimulus-response-reinforcement sequence to get a child to imitate sounds and words by rewarding productions that move closer to a correct target production. A long series of studies showed these methods can be quite effective for getting children who are preverbal and have ASD to talk. One addition to DTI for speech that seems to be helpful is the use of rapid motor imitation antecedent (RMIA) training, which gets the child to repeat a series of simple motor imitations before a vocal imitation (Tsiouri & Paul, 2012). DTI methods don't work for everyone, but one study showed they worked for about half the preschoolers with no speech in a clinical trial (Paul, Campbell, Tsiouri, & Gilbert, 2013).

Several other studies showed that some proportion of young children who are nonverbal and have ASD learn to talk using a method called milieu teaching (e.g., Paul et al., 2013; Yoder & Stone, 2006) or other naturalistic behavioral methods that are not as highly structured than DTI. These methods set up temptations like those used in assessment and require children to produce sounds and then speech in order to get objects and activities they enjoy. This method involves engineering the child's environment so that there is a lot of interesting stuff around, but the child can't gain access to it without help from the adult.

Finally, research by Kasari et al. (2014) showed that using an electronic device that generates speech—such as a switch, other devices that can be programmed to play prerecorded speech when activated, or software for tablet-style computers such as iPads that talks when a picture is touched—can also increase spoken language, especially when combined with milieu-style temptation activities.

Families of young children who are preverbal and have ASD should make use of AAC methods to provide the children with a way to express wants and needs and to begin to understand the function of communication during the early years. Some regular part of the communication program, however, should also include time devoted to modeling and eliciting speech, using one of the methods mentioned here. A child's opportunities to make the important transition from communication to language will be optimized when both an AAC modality and time to focus on vocal and speech production are provided.

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These interventions won't look like typical speech-language therapy because they aren't focused on proper pronunciation or oral postures needed to produce sounds. Instead, their aim is to connect vocal sounds with functional communication. The link between sound and meaning is likely to be missing for children who are preverbal and have ASD; the problem is not simply that they do not know how to form the sounds of speech. They may not know how to form sounds, but the reason is probably not based in motor weakness or incoordination but in lack of practice that comes from not understanding the communicative function of making sounds. Once a child has the "Aha!" experience that communication is a way to get enjoyable things, it makes more sense to focus attention on the mechanics of speaking; that's the moment that needs to be created. Simple, consistent models of speech that the child can associate with fun activities need to be provided so that the desire to ask to do them again is created. It's why a child like Juan may start saying "ee" when he wants to eat after he's been taught the sign for eat. Once he sees the link between the sign, what he wants, and the word *eat,* he has a reason to learn to say "eat." Some children may take this additional step—to spontaneously say words they've learned through an AAC system. Additional opportunities to try spoken versions of communicative acts in supportive situations can enhance the chances that this transition to speech will take place, so some speech-focused activities need to be added to the sessions that involve working on an AAC system. Children need opportunities to practice the motor patterns involved in speech because speech is a motor behavior that has to be learned through practice, just like other motor behaviors such as learning to ski, skate, or play an instrument. Words need to be connected to meaning, so the focus of intervention should not be solely on drilling motor patterns. Meaningful opportunities need to be provided so children with ASD can practice producing words and sounds in settings where immediate rewards are received.

WHAT CAN PARENTS DO TO SUPPORT COMMUNICATION DEVELOPMENT IN YOUNG CHILDREN WITH ASD?

Although you certainly want to get your child with ASD into an intervention program as early as possible, there many informal ways you can support your child's communicative development outside of formal therapy.

Communication

Most parents feel that they need the professionals to teach their child with ASD the important skills he or she needs to learn. It's true that there are some special techniques that are useful in working with children with ASD, and it does take extra patience to explicitly teach the things most children learn naturally without any effort or direct instruction. Many of the social communication skills a young child needs can be practiced in simple, everyday situations if you know how to take advantage of them. It is possible to identify situations in which you can slightly modify the way you behave or slightly alter the environment in order to contrive more situations for your child to practice communicating needs and ideas.

Parents often interpret their children's needs before they express them, but this can lead to missing opportunities to have children practice expressing thoughts in a conventional way. For example, when your child sees you pulling your telephone out of your bag and immediately runs toward you and looks at the telephone, you may know he or she wants the telephone to play Angry Birds. But instead of just handing over the telephone, you might say, "Oh, do you want something?" and pause and wait for the child to respond in some way. If you get a look and perhaps a sound or a sign, then you can turn over the telephone, knowing your child has made a connection between expressing a communication and its result. If you can't elicit a request, and the child merely continues to look at the telephone or grabs at it, then you could take his or her hand, shape it into a point toward the telephone, make the sign for telephone, or offer a spoken prompt ("Telephone, please?"), depending on your child's current level of expression. You might give three chances to take your cue and produce a conventional request. If you don't get a request after

three attempts, then you can give hand over the phone, first modeling "Telephone, please," or making the sign for the child.

These kinds of communication temptations can be embedded throughout your normal daily routines and include making requests as well as making choices (e.g., "Do you want the grapes or the blueberries?"), following a sequence (e.g., "First socks, then shoes"), playing hide-and-seek games (e.g., putting objects the child likes under covers and modeling how to exclaim "ball" when it's uncovered), and imitating actions (e.g., start a preferred routine game such as "The Itsy-Bitsy Spider" and pause, waiting for the child to imitate the last action before you produce the next one). You should feel free to ask your team for suggestions for including these kinds of communication temptations throughout your day. Once you start, you will discover many opportunities on your own to practice interactive abilities, and the more chances your child gets to use them, the more easily communication will come.

Eye Contact

You've probably heard and noticed that making eye contact is a primary difficulty for children with ASD. It's not that children with ASD never look people in the eye, but they do it less often and less skillfully. They are less likely to look not only at people but also at what other people look at, and they interpret other people's gaze patterns less adeptly. We don't want to simply get children to make eye contact, we want them to use gaze to organize their social interactions. You might try the following to help them:

- Hold items you are talking about to the child at eye level.
- Wait for the child to look at you before starting a communicative exchange or before giving an item he or she is requesting. For example, if your child is on a swing, then pull the swing close to you and don't let the swing go until the child looks at you.
- Play games such as hiding treasure in one of your closed fists, and have your child guess which hand it's in as you look back and forth from the child to the correct hand. Do the same with other locations, always looking back and forth from the child to the location to cue the correct place to look.

Reading

Looking at picture books is a great way to spend time with young children because it teaches them about how books work, which helps them get ready to read, and provides repetitive language that goes with attractive pictures, which helps them learn what words and sentences mean. It helps children at somewhat higher levels of development learn to remember and understand sequences of events in stories and talk about characters' feelings and

intentions. They can also learn new words from books that they may not hear in everyday conversation. There's a lot to be gained from this simple and enjoyable activity.

Children with ASD often are less interested in books than other children. You may have to make the books a little more exciting for them than you would for another child by using funny voices, singing some of the words, or doing actions that go with the story. Numerous storybook apps are available on many electronic tablet platforms that might appeal to your child. A good place to look for these is http://appadvice.com/applists/show/children-ipad-books.

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You might want to focus on using books to help children who already understand a lot of language comprehend how people feel, how they think, and how sometimes they don't mean exactly what they say. For example, put sticky notes with thought bubbles on the pages and ask your child what the character may be thinking.

Finding time to spend with books is a good investment, regardless of your child's level of function. Try to find ways of making storybook reading a special, fun time for your child, not a chore. You want to instill a love of books, and if you just can't find a way for your child to enjoy it, then it's better to let it go and try again another time. But children with ASD love routines, and if you can establish a predictable routine for reading a book together the same time every day in the same place, then your child will come to look forward to it. Try not to read the same book every time, or your child may become fixated on that book and not allow you to read others. There's no problem with returning often to a favorite book, however, as long as you can get the child to tolerate others as well.

How to Play with Your Child with ASD

Children love when their parents play with them, but remember that it only stays enjoyable for your child if you play at your child's level. Making a game more complicated than a child is ready for, even though it makes it more interesting for you, can frustrate the child. The following are some tips for playing with your child with ASD.

Repetitive Play Most children, especially those with ASD, love to play the same game repeatedly. This is one situation where you can use your child's enjoyment of repetition to advantage. Encourage reenacting the same sequence or game as often as the child likes (you will probably get tired of it before the child does), but add a little change in the routine every now and then. For example, if your child likes switching the light switch on and off, then make it into a game, but insist on taking turns. Let the child flick the switch, flick it once yourself,

then put your hand over it and wait. When the child looks at you, say, "My turn," or "On," and try to get a vocal or motor request before letting him or her have a turn to flick. Again, give up to three chances to follow the prompt. If the child responds, then let him or her flick the switch a few times; if not, then give one more prompt and let him or her have a turn. Repeat until the child tires of the game.

Play with Toys Children with ASD often like cause-and-effect toys, such as Poppin' Pals or a jack-in-the-box. These are fine for repetitive play, but you may want to encourage your child to use other toys as well, which will likely require you, or perhaps the child's siblings, to play along with him or her. Educational toys, such as shape sorters, nesting and stacking toys, and puzzles, are worth including because they help the child learn spatial concepts and can also serve as a way to introduce the words for shapes, colors, and sizes. If the child isn't initially interested in them, then try playing with them yourself (or having the sibling play) for a bit and let the child do as he or she likes. It's likely he or she will become interested in what you have. If so, you can use the toy to take turns, and you can name the colors, shapes, and sizes of the objects as you play with them (e.g., "I'm putting the square in now. The blue square. Your turn. Here's the circle. You put the circle in.") Keep all the pieces yourself so the child needs to interact with you to get each piece and take a turn. If the child doesn't spontaneously join the play, then you can move other objects out of reach and suggest the child join you or the sibling. Remember that this only works if the result is fun for the child. If he or she protests and becomes upset about losing access to what he or she was doing, don't worry. Let it go and try again another time.

Don't forget the play value of things that children with typical development often treat as toys, even when they weren't meant that way. The cardboard box a toy was packaged in can often provide as much enjoyment as the toy itself. Your child may like to climb into a large cardboard "bus" and be pushed. The cardboard box can become a bumpy bus, a fast train, or a rocky boat, all of which can be used to teach your child to request which vehicle he or she wants after a few turns.

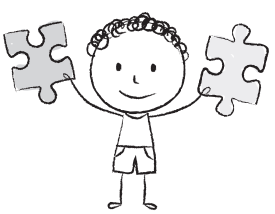
It is especially important for children with ASD to learn to enjoy a variety of objects and activities so they don't become fixated on any one. Even if you find something your child loves, be sure to vary it in some way over time. Continue to introduce new play things and model different ways to use them. Siblings are great at this because activities with another child are often appealing even to children with ASD.

Letter and Number Play Many children with ASD seem particularly interested in letters and numbers. They may want to repeatedly put together the same alphabet puzzle or line up numbered blocks in the same sequence many times. Parents can become excited about this kind of play and encourage it, thinking it bodes well for reading and math abilities. It may, but it can also develop into an isolated or *splinter* skill that fails to lead to adaptive use.

If you notice this kind of interest in your child, then try to encourage variety. If the child likes an alphabet puzzle, then try encouraging matching each letter piece to a plastic magnet letter (the kind that stick on the refrigerator), letters in an alphabet book, or letters on T-shirts. Use the letters to sing the alphabet song together, putting the pieces on the table instead of in the puzzle. Stack the letters as if they were blocks, get a bucket and take turns playing basketball by throwing each letter in the bucket. Play Hide and Seek by taking turns putting each letter in different places around the room and letting the child find it. This would also be an opportunity to either look at where you hid the letter to help the child find it (and to help him or her learn to follow others' gaze), to point to where you hid it (to help him or her learn to follow a point), or—if your child understands some language—to say where it is (e.g., "Look under the table"). Feel free to name the letter in each activity or say, "A is for apple," but the point is to help the child learn new ways to play instead of constantly repeating the same ways. It's certainly possible to learn the letter names and sounds this way, but this kind of play will also lead to learning a more flexible set of play schemes that can be used with other materials. Try introducing some other materials into these games whenever your child will accept them. Box 3.4 presents some additional tips for playing with your child with ASD.

Playing with Your Child with ASD

- Try to have 5–10 minutes each day set aside for play. Your child doesn't have to have the same playmate each time (e.g., mom, dad, brother, sister, cousin, grandma).
- Sit at your child's level (e.g., on the floor).
- Let your child choose the toys or activities and follow his or her lead.
- Imitate what your child does by doing the same thing next to him or her and take turns (e.g., he or she pushes the car once, then take it from him or her, do the same action, and hand it back).
- Slow down your rate of speech and vary your volume and pitch in a sing-song way. Or just pick a tune and sing whatever you say.
- Talk about what your child is doing in short and simple words or sentences.
- Do not expect your child to repeat what you say.
- Tell your child the names of objects instead of asking him or her to label them.
- Try to avoid saying "no."



(continued)

BOX 3.4 *(continued)*

- Use the child's name at the end of a sentence, especially when praising him or her (e.g., "Well done, Ahmed!").
- Allow silent times.
- Wait for your child to begin interactions.
- Understand and respond to any form of communication, even a simple quick look at you while he or she is playing. Respond with, "Yes, I see you playing with the car!"
- Treat behavior as if it were communication, even if the child may not have meant it that way. If the child accidentally rolls a car in your direction, then take it and say, "Oh my turn! Thank you! You gave me a turn!"
- Imitate and praise any sounds the child makes, especially those that sound like speech. Don't worry if you don't understand what the child meant or if he or she meant anything. Respond to his or her sounds with excitement and your own vocalization.
- If the child says a word, then repeat it back with correct pronunciation, but continue to respond to his or her immature form with your mature form.
- Praise your child lavishly, using facial expressions, hugs, tickles, or anything else he or she likes.
- Ignore any inconsequential behaviors while playing (e.g., if he or she screams when blocks fall apart). If you give attention to these behaviors, even by trying to calm him or her down, then they may actually be strengthened. Simply help him or her fix it without any comment or facial expression.
- Keep it happy. If your child becomes upset at something you try, then ignore the outburst and go back to the previous form of play. Don't give up; try again later.
- Set the scene for some messy play. Cover the table with plastic and let the child fingerpaint with pudding, shaving cream, or cornstarch paste. This is a great chance to use words for how things feel—*slippery, gooey, yucky, cold, sticky,* and so forth.

CONCLUSION

This chapter discussed the central place that communication has in identifying and treating ASD in young children and explained how this crucial skill is evaluated as part of the assessment of children with ASD. It also looked at some of the approaches to treating the communication impairments common in young children with the syndrome. Finally, the chapter provided ideas about how you can supplement the formal intervention program your child will receive with simple activities that can be included within everyday routines. The next chapter introduces you to the professionals who may be involved in developing and delivering the more formal part of your child's intervention program.