https://www.cesa7.org/sped/autism/early/ear11.htm

years, different modes of technology have been used to improve the quality of life of people who have various developmental disabilities . However, the varied use of technology for children with autism continues to receive limited attention, despite the fact that technology tends to be a high interest area for many of these children.

This article will discuss how various modes of technology (including technology designed as augmentative communication systems), can be used for children with autism to increase or improve their:

Overall understanding of their environment;

Expressive communication skills;

Social interaction skills;

Attention skills;

Motivation skills;

Organization skills;

Academic skills;

Self help skills;

Overall independent daily functioning skills.

What is Assistive Technology?

According to the Technology-Related Assistance for Individuals with Disabilities Act of 1988 (Public Law 100-407), an assistive technology means any item, piece of equipment, or product system, whether acquired commercially, off-the-shelf, modified or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. Assistive technology service is any service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device.

Typically, children with autism process visual information easier than auditory information. Any time we use assistive technology devices with these children, we're giving them information through their strongest processing area (visual). Therefore various types of technology from "low" tech to "high" tech, should be incorporated into every aspect of daily living in order to improve the functional capabilities of children with autism.

Visual Representation Systems

It is important to determine which visual representation system is best understood by the child, and in what contexts. Various visual systems, such as objects, photographs, realistic drawings, line drawings, and written words, can be used with assorted modes of technology, as long as the child can readily comprehend the visual representation.

Some children may need different visual representation systems in different situations. This may be dependent upon numerous factors, such as the skill being taught, as well as the unique characteristics of autism: attending, organization, distractibility, etc.

Example: A child may use real objects for his visual schedule, as the objects appear to give him more information as to where he's going and what's coming up next, as well as to help him remain more focused during the transition. However, this same child may use photographs or line drawings in a picture exchange in order to communicate expressively.

Some researchers suggest that, for most children, it is best to start with a visual representation system of line drawings, and move to a more concrete representation system of photographs or objects needed (18). See the line drawings in Mayer-Johnson "Picture Communication Symbols".

The Mayer-Johnson software program, Boardmaker, is a user-friendly program for both adults and children (18). The program offers a 3,000 Picture Communication Symbol (PCS) library in either black/white or color, and can be accompanied by any written word/message. The symbols can be made in any size, and tend to be universally understood. They present a relatively clear, 'uncluttered' representation and remove any ambiguity, which can sometimes arise when using photographs, especially personally-made photographs, as in the following example.

Example: A teacher took photographs of the various teachers that a child with autism encountered at school, in order to help him learn the names of his teachers. When reviewing the names of the teachers in the photographs, the child referred to the photograph of a particular teacher as "Mexico". Upon further review of this photo, the teacher realized that in the background, barely visible, was the corner of a map of Mexico. Although the teacher's face was the prominent feature in the photo, the child processed the minimally visible map as the most prominent feature and thus labeled the photograph according to this feature.

When using line drawings such as Boardmaker, caution should also be taken in determining whether to use black/white or color picture communication symbols, as some children with autism may prefer or dislike specific colors. They may focus only on the color instead of processing the entire picture. This will render the Picture Communication Symbol (PCS) virtually meaningless to the children as they are not processing the entire picture. Black and white picture communication symbols tend to remove any ambiguity which might arise.

Example: If a child prefers the color red, and the Picture Communication Symbol (PCS) for "lunch" has a red apple as well as a brown sandwich and orange juice, the child may only process the apple, as it contains his preferred color. The child may not even process the image, but attend only to the color red. Therefore, the PCS becomes non-meaningful to the child.

If the child has difficulty understanding the Picture Communication Symbol (PCS) line drawings and needs a more concrete representation, a good software program to use is Picture This (20). This program allows for the presentation of real photos, without risking ambiguous background clutter, which can be a part of personal photographs. Picture This contains over 2,700 photos from numerous categories which are ideal for:

Creating schedules;

Augmentative communication systems;

Games;

Reading activities;

Sequence activities for following directions;

Various academic activities.

Strategy: To teach a child, who is using photographs or objects as his visual representation system, to understand black/white line drawings, place a small black/white picture communication symbol in the corner of the various objects/photographs currently used by the child. Gradually increase the size of the picture communication symbol until it eventually covers up the entire photograph/object.

For children who have difficulty understanding two dimensional visual representation systems (e.g., photo, drawings, line drawings), and require objects as their visual representation systems, the use of True Object Based Icons (TOBIs) is suggested (3). These TOBIs can be any line drawing, picture, etc., which are cut out in the actual shape or outline of the item they represents. The child can both see and feel the symbol and shape, thus assisting him to more readily understand the two-dimensional representation system. TOBIs tend to be somewhat larger than the typical two-dimensional visual representation system. When first introduced, they may be 3 inches in size or larger (3). The printed word label should always accompany the picture, and should be placed strategically so as not to alter the symbol shape.

Strategy: When any visual representation system is used, it is important to combine it with a written word, as many children with autism exhibit a high interest in letters and words, and some even become early readers. Therefore we should continually enhance the child's literacy skills by also providing the written word with any type of visual representation system.

The rest of this article will outline the various skill areas commonly associated with children with autism, with supporting technology strategies defined as follows:

"Low" Technology: Visual support strategies which do not involve any type of electronic or battery operated device - typically low cost, and easy to use equipment. Example: dry erase boards, clipboards, 3-ring binders, manila file folders, photo albums, laminated PCS/photographs, highlight tape, etc.

"Mid" Technology: Battery operated devices or "simple" electronic devices requiring limited advancements in technology. Example: tape recorder, Language Master, overhead projector, timers, calculators, and simple voice output devices.

"High" Technology: Complex technological support strategies - typically "high" cost equipment. Example: video cameras, computers and adaptive hardware, complex voice output devices.

Effective Programming for Young Children with Autism (Ages 3-5)

by Susan Stokes Autism Consultant

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Introduction

The positive outcome of early intervention programming for any child with developmental delays/disabilities has been documented in numerous research articles and publications. However, unlike many other developmental disabilities, children with autism are typically not diagnosed until between the ages of two and three, as there are no medical tests to make a definitive diagnosis of autism at an earlier age. Many medical professionals prefer to take a "wait and see" approach, due to the wide range of "normalcy" in early developing children. Thus early intervention programming can often be delayed for these children, resulting in the "loss" of several critical years of intensive intervention during which significant developments in the brain are occurring. Due to this time factor, once a diagnosis is given, early intervention programming becomes crucial to appropriately address the child's needs in all developmental areas and, most importantly, to develop the child's ability to function independently in all aspects of his life.

Effective interventions for young children with autism are based upon the presence of certain fundamental features. Therefore, a "best practice" approach for providing early childhood services for children with autism should incorporate the fundamental features discussed in this article. Much of this information is also covered in more detail through the statewide training. This link will access information on Autism and the Early Childhood Training: http://www.dpi.state.wi.us/dpi/dlsea/een/auttrain01.html

Fundamental Features

The fundamental features necessary for a successful early childhood program for children with autism are:

Curriculum Content

Highly Supportive Teaching Environments and Generalization Strategies

Need for Predictability and Routine

Functional Approach to Problem Behavior

Transition Planning from Early Childhood program to elementary school

Family Involvement

Each of these components will be discussed in detail.

Curriculum Content:

The curricular areas to be focused on in an early childhood program should address the core features and characteristics of autism spectrum disorder. The goals and objectives to address each curricular area should be highly individualized for each child's developmental level, as well as his learning strengths and weaknesses (5). Knowledge of typical child development is also crucial in providing a guideline for intervention in the curricular areas. The following curricular areas have been identified as essential to meeting the needs of young children with autism spectrum disorder:

Attending Skills: A common feature of autism is the child's significant difficulty in interpreting and prioritizing the importance of various external and internal stimuli continually bombarding him (e.g., a fly buzzing around the room; internal perseverative thoughts such as recitation of math facts). As a result, many of these children can exhibit the following:

Variable attending skills: The child demonstrates attending skills that vary significantly, depending upon his interests. For example he attends well to what is interesting or "makes sense", such as the computer, videos, puzzles, etc., but attends poorly to large group listening activities.

Difficulty in shifting attention from one stimulus to another: For example if the child is engaged in a visual perceptual task of putting a puzzle together, he may not be able to shift his attention to focus on an auditory directive given by the teacher.

Difficulty attending in situations where there are multiple stimuli. Because the child with autism has significant difficulty shifting attention, as well as prioritizing stimuli, attending to the "essential information" is challenging. For example, if the child's focused attention is on "sitting appropriately in a small group setting", he may not be able to focus on the information being taught by the teacher.

Imitation: Imitation is a critical developmental skill for children with autism spectrum disorder to develop, as learning throughout life is based on the foundation of being able to imitate. The ability to imitate impacts learning in all areas, including social skills and communication. Various imitation skills must be specifically and directly taught to the child with autism. These include:

Imitating fine and gross motor movements;

Imitating actions on objects;

Imitating designs with manipulatives;

Imitating sounds and words;

Communication (Understanding and Use): Children with autism exhibit significant communication difficulties in both their abilities to comprehend and to express language appropriately. Many children, at the early intervention level, have not learned the "power" of communication - that is, the cause and effect of communication. They have not developed the "intent" to communicate. Some children will try to obtain the desired item themselves and not seek out others for assistance. Children with autism have difficulty understanding that communication is an intentional exchange of information between two or more people. Therefore in order to teach this intent to communicate at this early intervention level, many children with autism must be "tempted" to communicate by using their highly desired objects and actions (1).

Play Skills with Toys: Children with autism exhibit marked difficulty engaging in appropriate play skills with toys. Play skills with toys can range from the following:

No interaction: The child shows no interest in touching or holding toys.

Manipulative/explorative play: The child holds and gazes at toys; mouths, waves, shakes, or bangs toys; stacks blocks or bangs them together; lines up objects.

Functional play: The child puts teacup to mouth; puts brush to hair; connects train sections and pushes train; arranges pieces of furniture in dollhouse; constructs a building with blocks.

Symbolic/pretend play: The child pretends to do something or to be someone else with an intent that is representational, including role-playing (e.g., child makes hand move to mouth, signifying drinking from teacup; makes a puppet talk; uses a toy person or doll to represent self; uses block as a car accompanied by engine sounds).

Appropriate play skills with toys and play with peers will need to be specifically and directly taught to children with autism.

Social Play/Social Relations: A core feature of autism is difficulty understanding, and engaging in, social interactions. At the early intervention level, children with autism typically exhibit significant difficulty engaging in social play with peers. Social play skills with peers can range from the following:

Isolation: The child appears to be unaware of, or oblivious of others. He may occupy himself by watching anything of momentary interest.

Orientation: The child has an awareness of the other children, as evidenced by looking at them or at their play materials or activities. However the child does not enter into play.

Parallel/proximity play: The child plays independently beside, rather than engaging with, the other children. There is simultaneous use of the same play space or materials as peers.

Common focus: The child engages in activities directly involving one or more peers, including: informal turn-taking; giving and receiving assistance and directives; and active sharing of materials. There is a common focus or attention on the play.

Typically developing peer models are essential to facilitate developmentally appropriate social behavior for children with autism.

Highly Supportive Teaching Environments and Generalization Strategies:

The previously noted curricular areas must be taught in an environment which takes into consideration the unique features and characteristics associated with autism spectrum disorder. The specific skills per curricular area should be taught in a highly supportive and structured teaching environment, and then systematically generalized to more functional, natural environments (1). Features of the environments which should be addressed include the following:

Physical Environment: Due to difficulties in appropriately processing and modulating all in-coming sensory stimulation, the physically structured environment should provide environmental organization for children with autism. (See next article for additional information.)

Furniture arrangement: Environmental organization includes clear physical and visual boundaries, which (a) help the child to understand where each area begins and ends, and (b) minimize visual and auditory distractions (2). Each area of the classroom (or other environment) should be clearly, visually defined through the arrangement of furniture (e.g., bookcases, room dividers, office panels, shelving units, file cabinets, tables, rugs, etc.).

Children with autism generally do not automatically segment their environments like typically developing children. Large, wide-open areas can be extremely challenging for children with autism. They do not understand what is to occur in each area, where each area begins and ends, and how to get to a specific area by the most direct route. Strategically placing furniture to clearly, visually-define specific areas will decrease the child's tendency to randomly wander/run from area to area.

Visual distractions can be minimized by painting the entire environment (walls, ceilings, bulletin boards, etc.) a muted color (e.g., off-white) as well as markedly limiting the amount of visual "clutter" which is typically present in most classrooms in the form of art projects, seasonal decorations and classroom materials. Reduction of Visual Clutter can be accompanied by using sheets/curtains to cover classroom materials (including equipment such as a computer or TV/VCR), or by removing unnecessary equipment/materials from the classroom or to an area not in the student's view. Certain fluorescent lighting can be visually distracting to some children with autism. Natural lighting via windows can provide an easy solution to this visual distraction. Through the use of blinds, curtains, or shades, the amount of light coming into the environment can easily be controlled, thus creating a warm and calm environment.

Auditory distractions: The lowering of auditory distractions in a physically structured environment can be achieved through the use of carpeting, lowered ceilings, acoustical tiles, P.A. system turned off or covered with foam to mute the sound, and headphones for appropriate equipment, such as the computer or tape players.

A physically structured environment will create an easily understood, predictable and thus calming environment for the child with autism. As a result the child's attention to the most relevant information for learning will be maximized.

(See the article "Structured Teaching: Strategies for Supporting Students with Autism" for more information on a physically structured environment.)

Visual Support Strategies: Visual support strategies refer to the presentation of information in a visually structured manner. These strategies are effective in helping children with autism understand what is expected of them and how to function appropriately. These strategies support the children's strongest processing area - visual. The visual cues help the child to focus on the relevant and key information. Visual support strategies help children with autism learn better and more effectively. These strategies also minimize stress and anxiety by helping children grasp their environment. Visual support strategies in an early intervention program can include the following:

Object Schedule

"Obect Schedule" schedules

directions (e.g., self help skills - tooth brushing; hygiene;

washing hands)

forewarning/foreshadowing

independent work activities

teaching rules/alternative behaviors

increasing language comprehension skills

expressive communication skills

making choices

turn-taking

waiting

attending

academic/readiness areas

"Activity Schedules"

(See the other articles "Structured Teaching: Strategies for Supporting Students with Autism" and "Assistive Technology for Students with Autism" for more information on visual support strategies.)

Trained Staff: A well trained staff in understanding the unique features and characteristics associated with autism is an essential feature in providing a highly supportive teaching environment. The Wisconsin Statewide Autism Training Project is accessible year round and covers multiple areas. Information on the training is found at the Wisconsin Department of Public Instruction website: http://www.dpi.state.wi.us/dpi/dlsea/een/cspd\_trg.html. In addition, CESA #6 provides numerous trainings relating to autism spectrum disorders. CESA #6 web site: http://www.cesa6.k12.wi.us . The Autism Society of Wisconsin also provides information of training opportunities. See http://www.asw4autism.org

Additional training in specific strategies is also suggested (e.g., Structured Teaching Practices, Picture Exchange Communication System - PECS, Sensory Integration Strategies, Music/rhythm integration strategies, discrete trial, Greenspan's Floortime web site: http://www.stanleygreenspan.com , etc.).

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Structured Teaching: Strategies for Supporting Students with Autism?

by Susan Stokes Autism Consultant

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Structured teaching is an intervention philosophy developed by the University of North Carolina, Division TEACCH (Treatment and Education of Autistic and related Communication Handicapped Children). . Structured teaching is an approach in instructing children with autism. It allows for implementation of a variety of instructional methods (e.g., visual support strategies, Picture Exchange Communication System - PECS, sensory integration strategies, discrete trial, music/rhythm intervention strategies, Greenspan's Floortime, etc.). The following information outlines some important considerations for structured teaching to occur. It is one of many approaches to consider in working with children with autism.

Eric Schopler, founder of Division TEACCH in the early 1970's, established the foundation for structured teaching in his doctoral dissertation (2) by demonstrating that people with autism process visual information more easily than verbal information.

What is Structured Teaching (1)

Structured teaching is based upon an understanding of the unique features and characteristics associated with the nature of autism.

Structured teaching describes the conditions under which a person should be taught rather than "where" or "what" (i.e., "learning how to learn").

Structured teaching is a system for organizing their environments, developing appropriate activities, and helping people with autism understand what is expected of them.

Structured teaching utilizes visual cues which help children with autism focus on the relevant information which can, at times, be difficult for the person with autism to distinguish from the non-relevant information.

Structured teaching addresses challenging behaviors in a proactive manner by creating appropriate and meaningful environments that reduce the stress, anxiety and frustration which may be experienced by children with autism. Challenging behaviors may occur, due to (the following characteristics of autism:

Language comprehension difficulties

Expressive language difficulties

Social relations difficulties

Sensory processing difficulties

Resistance to change

Preference for familiar routines and consistency

Organizational difficulties

difficulty attending to relevant stimuli

distractibility

Structured teaching greatly increases a child's independent functioning (i.e., without adult prompting or cueing) which will assist him throughout life.

This article will address the features of a structured teaching approach. It is important to remember that to effectively use the features of this approach, the individual's strengths and needs must be taken into consideration.

Primary Components of Structured Teaching:

Physical structure

Visual Schedules

Teaching method

Physical Structure

"Locker / Cubby Areas"

Definition: Physical structure refers to the way in which we set up and organize the person's physical environment: It emphasizes where/how we place the furniture and materials (1) in the various environments including classrooms, playground, workshop/work area, bedroom, hallways, locker/cubby areas, etc.

Close attention to physical structure is essential for a number of reasons:

Physical structure provides environmental organization for people with autism.

Clear physical and visual boundaries help the person to understand here each area begins and ends.

The physical structure minimizes visual and auditory distractions.

The amount of physical structure needed is dependent on the level of self-control demonstrated by the child, not his cognitive functioning level. As students learn to function more independently, the physical structure can be gradually lessened (5).

Example: A high functioning child with autism may display limited self control. He will need a more highly structured environment than a lower functioning child displaying better self control.

Physical structure consists of a number of components:

Location: Physical structure should be considered in any environment in which the person with autism interacts, including classrooms, playground, workshop/work area, bedroom, hallways, locker/cubby areas, etc.

"Design / Layout"

Design/Layout.

Clear visual and physical boundaries: Each area of the classroom (or environment) should be clearly, visually defined through the arrangement of furniture (e.g., bookcases, room, dividers, office panels, shelving units, file cabinets, tables, rugs, etc.) and use of boundary markers, such as carpet squares or colored floor tape. Children with autism typically do not automatically segment their environments like typically developing children. Large, wide-open areas can be extremely difficult for children with autism to understand:

What is to occur in each area;

Where each area begins and ends, and

How to get to a specific area by the most direct route.

By strategically placing furniture to clearly visually define specific areas, it will decrease the child's tendency to randomly wander/run from area to area. Visual physical boundaries can also be further defined within a specific area.

Example: During group story time, a carpet square or taped-off square can provide the child with autism clear visual cues as to the physical boundaries of that activity. Floor tape can also be used in gym class to indicate to the child with autism the area in which he should stay to perform certain motor skills, like warm-up exercises.

Example: Color coded placements (according to each child's assigned color) can be used for snack or mealtimes. The placements will visually and physically define each child's "space" (and food items) on the table.

These visual cues will help children with autism better understand their environment, as well as increase their ability to become more independent in their environment and less reliant on an adult for direction.

Minimize visual and auditory distractions: Visual distractions can be minimized:

By painting the entire environment (walls, ceilings, bulletin boards, etc.) a muted color (e.g., off-white);

By limiting the amount of visual "clutter" which is typically present in most classrooms in the form of art projects, seasonal decorations and classroom materials;

By placing sheets/curtains to cover shelves of classroom materials, as well as other visually distracting equipment (e.g., computer, copy machine, TV/VCR, etc.);

By storing unnecessary equipment/materials in another area.

Example: In the play area, limit the number of appropriate toys which the children can use and then, on a weekly basis, rotate in "new" toys, while putting away the "old" ones.

Through the use of natural lighting from windows to reduce visually distracting fluorescent lighting;

By controlling the amount of light through the use of blinds, curtains, or shades, thus creating a warm and calm environment;

By placing study carrells and individual student work areas, bordered by a wall or corner of the classroom, away from group work tables can also reduce environmental visual distractions;

By carefully considering where the child with autism will sit in the regular education classroom.

Example: Tony, a student with autism was seated in the front of the class, facing away from the door or windows and away from shelves with instructional materials in order to minimize visual distractions.

Auditory distractions can be reduced through the use of carpeting, lowered ceilings, acoustical tiles, P.A. system turned off (or covered with foam to mute the sound) and headphones for appropriate equipment, such as the computer or tape players.

Develop appropriate instructional, independent, recreation and leisure areas in each physically structured environment.

"Crash / Quiet Area"

In a classroom setting, these areas may include:

Small group work area;

Independent work area;

1:1 work area;

Play/recreation/leisure area;

Sensory motor area;

Crash/quiet area.

At home, these areas may include:

An independent work area;

Play area;

Crash/quiet area.

Again, these specific areas should have clear visual boundaries to define each area for the child with autism. It is also important to keep in mind the various distractions which may be present in each area, and make accommodations accordingly.

Organization: A physically structured environment must be extremely organized to effectively implement a structured teaching approach. Adequate storage of various materials (not in view of the students), which can also be easily accessed by the adults in the environment, is critical.

Example: A sectioned-off storage area (with high dividing units to keep materials out of sight of the students) within the classroom can be very helpful to keep the environment "clutter and distraction-free" yet provide easy access to needed materials.

"Picture Jig"

Students with autism can also be taught to keep the physical environment structured and organized through the use of pictures, color-coding, numbers, symbols, etc.

Example: In the play area, pictures of the toys can be placed on the shelves to provide structure when putting things away.

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Developing Expressive Communication Skills for Non-verbal Children With Autism

by Susan Stokes Autism Consultant

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What is Communication?

Communication is a range of purposeful behavior which is used with intent within the structure of social exchanges, to transmit information, observations, or internal states, or to bring about changes in the immediate environment. Verbal as well as nonverbal behaviors are included, as long as some intent, evidenced by anticipation of outcome can be inferred. Therefore not all vocalization, or even speech, can qualify as intentional communicative behavior (7). This definition emphasizes that communication takes place within a social context. Speech/verbalization becomes communication when there is a desire or intent, to convey a message to someone else. Because social relations are a primary area of difficulty for children with autism, it is not surprising that effective communication is significantly impaired for these children. These two areas, communication and social skills, are tightly interwoven and interdependent. Therefore the development of communication skills cannot be the sole responsibility of the speech/language pathologist. While she may provide the "guide posts" and strategies, communication must be addressed continually by everyone who comes in contact with the child.

The two-fold purpose of this article is to provide:

I

Key questions to consider in order to determine the child's current communication abilities;

II

Information regarding the development of a communication intervention program based on the child's communication needs.

Key questions to consider in order to determine the child's current communication abilities.

In order to develop an appropriate communication intervention program for the non-verbal child with autism, it is essential to determine the child's current communication abilities. The following are important questions to consider in order to make this determination:

Does the child exhibit intentional communication?

It is important to determine if the child is exhibiting communicative intent. Intent to convey a message distinguishes communication from non-communicative speech, verbalizations and gestures. When the child anticipates an outcome from his communication, regardless of the form (i.e.: speech, gesture, etc.), he demonstrates intent.

Example: A parent responds to a crying child. At this point, the child has not exhibited communicative intent. However if the child continues crying, looks at the parent, and then looks at a desired object, intent to communicate has been demonstrated. Through crying, looking at the adult and looking at the object, the child is anticipating that she will obtain the wanted item.

Communicative intent is indicative of the child's desire to communicate. In turn, the desire to communicate is inextricably tied to the development of social relationships, an area of significant difficulty for children with autism. Because these children are often unaware of, or may be uninterested in, others, communicative desire or intent is often absent. They do not understand that they can use communication to get something, or to get someone to do something for them. They attempt to get their needs and wants met by themselves in any way possible, and may exhibit distress when unsuccessful. When interacting with a child with autism, it is important to be able to distinguish this distress from a desire to communicate, in order to determine if the child is exhibiting communicative intent.

In what way does the child communicate?

A child with autism, who demonstrates intentional communication, can do so using various forms or modes. It is important to consider which of the following communication forms are used by the child:

Motoric: Direct physical manipulation of a person or object (e.g., taking a person's hand and pushing it towards a desired item; giving a cup to a caregiver to indicate, "Want milk").

Gestural: Pointing, showing, gaze shift (e.g., a child looks or points to a desired object and then shifts his gaze to another person, thereby requesting that object. [i.e. the communicative act of requesting).

Vocalization: Use of sounds, including crying, to communicate (e.g., a child says "ah-ah-ah", to draw another person's attention to him).

Sign language: Communication with a conventional sign language system.

Using objects: The child hands an object to another person to communicate (e.g., the child hands a cup to his parent to indicate "drink").

Using photo: Use of two-dimensional photographs to communicate (e.g., the child points to, or hands photographs of various objects, actions or events to communicate his desires).

Pictorial: Use of two-dimensional drawings which represent objects, actions or events (e.g., a child hands a line drawing of a "swing" to his parent to indicate that he wants to swing).

Written: Use of printed words or phrases to communicate (e.g., the child writes, "too loud" to indicate that the noise level in the environment is bothering him).

In addition it is important to determine if the form of communication used by the child varies, depending upon the context and situation or the type of communication desired. For example, the child may use a motoric mode of communication (taking a person's hand and pushing it towards a desired item) to request an object. However the same child may use a vocalization (crying) to reject an item, or to protest.

How does the child use his language to communicate?

Research has shown that the child with autism uses his language to communicate for a narrow or restricted range of purposes or functions (7). There are three primary functions or purposes of language: behavioral regulation, social interaction and joint attention (7). It is important to note that all three communicative functions are developed by approximately age 12 months in typically developing children, and are listed in hiearchical order from least social to most social (6):

Behavioral Regulation: This is the easiest and earliest emerging communicative function (6). The child uses communication to request / protest, or satisfy his immediate physical needs. Behavioral regulations include:

Requesting objects

Requesting actions

Requesting assistance

Protest/reject object

Protest/reject action

Social Interaction: Types of communicative behaviors that are used to initiate, respond to, maintain, or terminate social interactions. These social communicative interactions include:

Requesting social routines (e.g., requesting to play "peek-a-boo" and "patty-cake" games);

Requesting comfort (e.g., requesting to be held when distressed);

Greetings (e.g., "Hi" /"Bye");

Calling attention: (e.g., child calls attention to self through calling others);

Showing off (e.g., child exhibits "show off" behaviors during games, such as peek-a-boo, dress up, etc.).

Joint Attention:

This is the most difficult communicative function for children with autism spectrum disorder to develop (6). These communicative acts are used to direct another's attention to an object, event, or topic of a communicative act. Joint attention communication acts include:

Commenting (e.g., a baby looking at his parent and pointing to the sky at an airplane overhead. The child is not requesting the airplane but commenting about it, drawing another person's attention to this object);

Requesting information from others (e.g., the child asks another "Where did you go?").

Giving information to others (e.g., the child gives information about something that is not obvious or known to another person: "I went to the fair last night");

Is there a reason for the child to communicate?

It is important to determine what motivates the child before developing a language intervention plan. As in typical child language development, children with autism will generally not engage in communicative interactions unless they are motivated to do so. Therefore, if the child loves swinging, or jumping or playing with string or particular foods, then these are the actions/objects that should be part of an intervention plan. Incorporating motivating activities and objects is vital when helping children develop communicative intent / desire. Teaching a core of early developing vocabulary words is merely teaching the child with autism to label and does not constitute teaching him to communicate. By initially using motivating actions and objects, the child will truly learn the purposes or functions of communication. Once the child has learned this, vocabulary can then be expanded through a variety of teaching strategies.

Does the child initiate and/or respond to communicative interactions?

Communication implies being both an initiator of, and a responder to information while engaged in a social situation (4). Therefore it is important to determine if the child with autism is able to understand, as well as participate in, both roles in communicative interactions.

Example: A non-verbal child might initiate a communicative interaction with his parent by vocalizing to call attention, and then pointing to request a desired item. The same child might respond by pointing to a picture of a desired food item when his parent asks, "What do you want to eat?"

Children with autism typically have difficulty initiating communicative interactions with others, and tend to be better at learning to respond (4). When determining if the child initiates or responds to any communicative interactions, it is important to ascertain the particular contexts/settings, the manner or form of communication and the communicative purpose or function.

Example: A child finds his mother in another room, takes her hand and leads her into the kitchen, where he places her hand on the refrigerator handle. The mother opens the refrigerator and begins taking items out one by one until the child indicates by facial and body expression which item he wants. In this example the child initiated communication in the kitchen (context) to request desired food (purpose), by using a motoric and gestural form of communication.

Is the child able to use "repair" strategies when communication breakdowns occur?

Due to their significant difficulties in successfully communicating, children with autism may experience frequent occurrences of communication breakdowns as both speakers (expressively communicating) and listeners (when asked to respond). Therefore it is important to determine if the child has developed, or is able to use, any communication repair strategies for both receiving and expressing communicative messages.

Communication breakdowns as a listener (receiving information): Because children with autism have significant language comprehension difficulties, many communication breakdowns as listeners may occur. These breakdowns transpire when the child does not understand, or responds inappropriately to verbal information. A communication repair strategy that can be used in these situations is to present the misunderstood information visually (children with autism generally process visual information more easily than verbal information. In this way one can determine if the child is not responding appropriately (communication breakdown), either because the information is given verbally, or he doesn't understand the information, whether verbally or visually presented. Many children with autism can easily be mislabeled as being non compliant when they do not respond to verbal information. Careful consideration should always be given to the child's ability to comprehend and respond to verbal information (as opposed to visual information) in determining the reason for the breakdown in the communication.

Repair strategies for communication breakdowns as a speaker (expressing information): When breakdowns in expressive communication occur, it is important to understand whether the child exhibits any of the following repair strategies:

Repeating the same communicative attempt: Being persistent. For example the child repeatedly points to a shelf out of reach, as the adult takes each item off of the shelf and shows it to the child to see if it is the desired item.

Showing the person what they are trying to communicate: a child might take an adult to the refrigerator, for example, open the door and reach towards a shelf where the milk is located, demonstrating that he wants milk.

Use of an alternative way to communicate the same message: In the above example, if the child points to the shelf several times, but the adult still does not understand (a breakdown in communication), the child might then choose a picture from his communication book to clarify his communicative request, thus repairing the breakdown in communication.

• Autism Papers Index • Next > >