Teaching Young Children with Disabilities in Natural Environments

by

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Teaching Children with Autism

Mary Jo Noonan

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- Learning characteristics of children with autism
- Instructional procedures effective for most children, including those with autism
- Specialized procedures focused on children with autism
- Model programs for children with autism

Children with autism spectrum disorder (usually referred to simply as autism) include children who vary widely in their abilities and educational needs. Autism was first defined as a disorder in 1943 by the psychologist Leo Kanner. He had encountered a number of children who had behavioral characteristics and needs that were strikingly different from children with intellectual disabilities and developmental delay. In particular, the children with autism had typical physical growth and development, but they also had social relationship difficulties, speech-language delays and differences, and obsessions with environmental sameness and/or stereotypies (repetitive movements such as finger flicking) and self-stimulations. Since that time, definitions and diagnostic criteria have been promulgated by a number of organizations and policies (e.g., Individuals with Disabilities Education Improvement Act [2004], Autism Society of America [n.d.], *Diagnostic and Statistical Manual of Mental Disorders* [American Psychiatric Association, 2013], but the central defining characteristics of the disorder have not changed. Diagnostic criteria have been distinguished among individuals with few or mild characteristics (Asperger syndrome) and those with more or pronounced characteristics (pervasive developmental disorder [PDD], including autistic disorder). In this chapter, the term *autism* will be used to refer to all labels and disorders on the autism spectrum, but keep in mind that the characteristics and needs will vary in number and degree (from mild to severe).

LEARNING CHARACTERISTICS OF CHILDREN WITH AUTISM

Many of the distinguishing characteristics of autism have important implications for instruction. Specifically, they suggest that certain content, instructional approaches, and environmental arrangements will be more effective than others. The following characteristics of children with autism should be considered in designing specialized instruction.

Communication and Social Needs

One of the most noticeable concerns of children with autism is that they have significant communication and social delays or differences. These delays and differences are often noticeable before the children are 1 year of age. One of the earliest apparent differences is that many infants and young children with autism do not engage in *joint attention* (Wetherby, Prizant, & Schuler, 2000). Joint attention is a social-communication skill whereby the child follows the gaze of an adult (that is, the child looks in the same direction and at the same thing or event that the adult is looking at). It is an important skill because it establishes a context for communication: The communication partners (in this case, the young child and adult) focus their communications and interactions on what they are looking at together. As children with autism become toddlers, their communication needs become more marked. For example, a mother may be worried when her 18-month-old child is not attempting to communicate or socialize (e.g., not pointing or otherwise indicating that she wants desired objects, not gesturing or vocalizing to be picked up or to get attention, not playing typical baby games such as peekaboo, crying when tired or frustrated but

not looking to an adult for comfort). Frequently, children with autism make little or no eye contact. They appear isolated and unaware of people and events in their environment. Some have socialization and communication behaviors that are markedly different from their age peers. For example, a child with autism may talk using only phrases and sentences imitated from cartoons. Or the child may play with toys in a repetitive and/or ritualistic manner (e.g., sorting and lining up plastic dishes) rather than in more object-specific or socially influenced ways (e.g., playing "tea party" with the cups and dishes) as age peers would do.

Related to their apparent isolation, children with autism have difficulty taking the perspective of others (Baron-Cohen, Leslie, & Frith, 1985)—a psychological ability referred to as *theory of mind* (Premack & Woodruff, 1978). In their landmark 1985 study, Baron-Cohen et al. studied a group of young children with autism matched on intelligence measures with children who had Down syndrome and children without a disability. They found that the children with autism were unable to impute mental states or beliefs to others (understand what others might be feeling or thinking), whereas their peers were able to do so. This finding suggested a unique social deficit, rather than an intellectual deficit, that distinguished children with autism from other children with and without disabilities. Theory of mind deficits or delays are apparent in young children with autism when they fail to show even the most basic language and social skills: They behave toward other people as though they are objects without feelings or communication abilities. For example, the child with autism takes a parent's hand to the sink when wanting a drink of water, or the child does not look or attend when another child cries.

Generalization Needs

The behavior of children with autism is often characterized as rigid. The children tend not to transfer skills learned in one situation to another, and they have difficulty in adapting or modifying skills to fit new situations. For example, a child with autism may learn to pop open the toothpaste lid but not generalize the skill to the pop-up top on the shampoo bottle; or she may learn to say "please" when she wants something to drink, but she may not transfer the use of the word to dinnertime when she wants something to eat, or to play activities to request a particular toy.

Preoccupation with Sameness

Many children with autism are most content and capable when expectations, materials, and other environmental variables remain constant or unchanged. For example, the child who sorts and lines up plastic dishes may be content while organizing the materials, but if asked to stop and put the materials away, he may become upset, even to the point of having a tantrum. Similarly, if he completes the task and someone disturbs the orderliness of his work (moves the toys aside or puts them away), he may react very strongly. When children with autism have a strong preference for consistency or order, it is not uncommon for families to be extremely cautious to avoid disturbing the materials or environmental arrangements on which the children focus.

Challenging Behavior

Children with autism frequently have numerous behavioral challenges: They may isolate themselves (hide under furniture), act aggressively toward others (hit, kick, push), injure themselves (bite, pinch, head bang), and/or demonstrate other socially inappropriate behaviors. As discussed in detail in Chapter 10, challenging behavior usually serves a communication purpose. Because children with autism have significant communication needs, it is not surprising that challenging behaviors are present.

Dawson and Osterling (1997) have suggested that effective programs for children with autism, given the children's unique characteristics and concerns, should include the following:

1. *Curriculum content emphasizing attending skills, imitation (gestural and verbal), language comprehension and use, appropriate toy play (functional and symbolic), and social interaction (with adults and with peers):* Attending and imitative skills are emphasized because they are *tool skills* that facilitate subsequent learning (and are often lacking in children with autism). Language comprehension and use and social interaction skills are included because they are high-need areas for children with autism. Appropriate toy play is a cognitive skill area that is included because children with autism often have difficulty understanding the social purpose of objects and the use of symbols (language learning relies on the use of symbols).

2. *A highly supportive teaching environment and generalization strategies:* The term *highly supportive* implies that instruction is carefully planned and executed based on the unique needs and strengths of the child. Supportive teaching often includes instructional objectives that are just slightly beyond the child's current performance level, direct instruction methods (see Chapter 6), and a consistent schedule (see Chapter 13). Because generalization difficulties are prevalent among children with autism, generalization strategies should be included in all instructional plans (see Chapter 6).

3. *Learning environments that are predictable and routine:* As discussed fully in Chapter 13, predictability and routines teach children what to expect. In turn, knowing what to expect supports children in demonstrating appropriate behavior and promotes independence. It's important to note that predictability and routines add order to what would otherwise seem a chaotic world. Children with autism commonly show a high preference for orderliness. Establishing predictable and routine learning environments capitalizes on a preferred learning style, creates a familiar and comfortable situation, and thereby facilitates learning.

4. *A functional, positive approach to problem behaviors:* A functional approach to problem behaviors focuses on teaching socially appropriate alternative responses to replace the problem behavior. In other words, children are taught socially acceptable ways (usually a communication skill) to get what they want (reinforcement), thereby eliminating the need for problem behavior. In addition, a number of positive strategies should be employed to prevent problem behavior, and the use of punishment should

be avoided. Chapter 10 describes functional and positive assessment and intervention procedures for challenging behavior.

5. *Carefully planned transitions to next setting:* Transitions are often difficult times for children with autism because changing from one activity to the next has the effect of ending an ongoing routine. As already discussed, children with autism prefer sameness and orderliness; ending a routine is viewed as disruptive. Therefore, transitions need to be planned, and related skills (identifying next activities, putting away materials) should be taught.

6. *Family involvement:* As emphasized throughout this text, family support is a critical component of early childhood special education. Because the extensive communication, social, and behavioral needs of children with autism may affect all aspects of family life, supports might include involving family members in planning and implementing interventions. For example, family members can participate in developing and conducting an intervention to teach a child to make eye contact and to point to a desired object (a social-communication objective).

These six items describe components of effective programs (also known as *comprehensive treatment models*) for children with autism. The recommendations of Dawson and Osterling (1997) are echoed in a more recent report from the National Research Council (2001). Additionally, the National Research Council recommends that young children with autism receive group instruction as well as individual instruction and opportunities for supported interaction with their peers who do not have disabilities.

Reviews of programs for young children with autism indicate that intensive, behaviorally based practices have the strongest evidence of effectiveness, while other models show promise (Howlin, Magiati, & Charman, 2009; Odom, Boyd, Hall, & Hume, 2010; Reichow & Wolery, 2009). While most behaviorally based programs begin with intensive individualized instruction in segregated settings (Lovaas, 1987; McEachin, Smith, & Lovaas, 1993), evidence for the effectiveness of inclusive behavioral programs is accumulating (Boulware, Schwartz, Sandall, & McBride, 2006; McGee, Morrier, & Daly, 2000; Stahmer & Ingersoll, 2004; Strain & Bovey, 2011). Most behaviorally based programs (inclusive and segregated), however, include naturalistic and parent-implementation components (Boyd, Odom, Humphreys, & Sam, 2010). Given that comprehensive intervention programs are not uniformly effective for all children, decisions on matching programs to children ultimately must be individualized and based on child outcome data (Howlin et al., 2009; Sandall et al., 2011; Simpson, 2005).

Just as reviews of comprehensive program models for children with autism have found that behaviorally based models have the most positive effectiveness data, recent reviews of evidence-based practices for young children with autism—focused on specific interventions and/or instructional approaches—concluded that behaviorally based interventions are currently the only interventions that are solidly supported by research and considered well established (Matson & Smith, 2008; Odom et al., 2003; Simpson, 2005). Other procedures (peer-mediated interventions, visual supports, self-monitoring, and involving parents) have been shown to be emerging and effective and probably efficacious

(Odom et al., 2003). The next two sections of this chapter focus on behaviorally based instructional procedures: 1) those for early childhood intervention that are effective for young children with disabilities and also applicable to children who have autism, and 2) those designed specifically for children with autism. This chapter concludes with a description of seven comprehensive model programs for children with autism.

INSTRUCTIONAL PROCEDURES EFFECTIVE FOR MOST CHILDREN, INCLUDING THOSE WITH AUTISM

The following eight instructional approaches have been shown to be effective for many children with autism, presumably because they fit with the children's learning styles and address critical developmental needs: 1) direct instruction, 2) naturalistic instruction, 3) general case instruction, 4) cues (versus general prompts), 5) prompt and cue fading, 6) group instruction, 7) augmentative communication, and 8) positive behavior support. Although these procedures are discussed in detail elsewhere in this text, this discussion focuses on special considerations in applying the procedures with children who have autism.

Direct Instruction

Chapter 6 fully describes *direct instruction,* which is defined as the consistent use of one or more prompts, a correction procedure, and a reinforcement strategy to teach an operationally defined behavior. For example, a child may be taught to ask her sibling to play with her by handing the sibling a toy. There may be a three-step prompting and correction procedure: 1) The adult points to the toy and waits 4 seconds; 2) if there is no response or an incorrect response the adult hands the child the toy, points to the sibling, and waits 4 seconds; and 3) if there is no response the adult guides the child to the sibling, guides the child to hand the sibling the toy, and says, "Jamie, please play with me." When the child hands the sibling the toy, the adult plays the child's favorite music softly as the reinforcer. Using a precise and consistent direct instruction procedure fits with the preferences for sameness and predictability that characterize the learning styles of many children with autism. And, indeed, research indicates that children with autism learn relatively quickly with systematic instruction (Dawson & Osterling, 1997; Lovaas, 1987; Matson & Smith, 2008).

As with any application of direct instruction, it is important to individualize the prompts and correction procedures for each child (Barton, Lawrence, & Deurloo, 2012). Children with autism tend to respond better to visual prompts compared with auditory prompts. However, teachers must be responsive to each child's performance data for each instructional plan. In other words, view each instructional plan as a "worksheet" to be modified based on its effectiveness. If the data for an instructional plan indicate that a child doesn't use a prompt (i.e., rarely or never responds correctly to a prompt), eliminate that prompt from the plan and use ones that are effective in eliciting correct responses.

Attentional Issues In addition to ensuring that prompts are individualized, it may be necessary to include an attentional prompt in the direct

instruction plan. Many children with autism attend predominantly to objects and the physical world and seem to ignore the social world. For some children, a prompt eliciting attention to the teacher (or adult) prior to the prompt associated with the instructional objective will improve instructional effectiveness. Returning to the example above of teaching a child to ask a sibling to play, the teacher might call the child by name and make eye-to-eye contact prior to delivering each prompt.

Although eye contact is a typical way that children demonstrate attention, there may be other valid indicators of attention for children who rarely make eye contact. Some children may stop their play and become still. Others may turn their attention from one set of materials to another. And still others may orient their body and/or face toward the speaker even though they don't make direct eye contact. If direct eye-to-eye contact is difficult to achieve, look for other indicators (such as the three presented here) that the child is attending, implement the direct instruction, and monitor learning. If the child shows progress, direct eye contact may not be a requisite to effective instruction. Attentional prompts may still be included in instruction, but attention may be operationalized as a behavior other than eye contact.

Reinforcement Issues Because of significant social delays and needs, children with autism may not be reinforced by verbal praise or affection—reinforcers commonly used with young children with special needs. It may seem difficult to identify potential reinforcers for children with autism because they do not show the same interests as their peers without disabilities. The following are three examples of approaches that may be used to identify instructional reinforcers: 1) test the effectiveness of verbal praise and social reinforcement, 2) conduct a reinforcer survey, and 3) assess the use of high-probability (high-*p*) activities, including stereotyped behaviors.

The first approach, *testing the effectiveness of verbal praise and social reinforcement,* is suggested for pragmatic reasons: Before assuming that verbal praise or social reinforcement will not be effective (even when a child has significant social needs and/or does not make eye contact), test it as part of a direct instruction plan. If the instructional plan is effective, then a very natural and highly generalizable reinforcement strategy has been identified and is available for instruction.

The second approach includes two procedures that may be used to identify a set of highly preferred items (which could include food) that are likely to function effectively as reinforcers. One procedure is to conduct a *reinforcer survey,* either by asking a child to name favorite items or presenting numerous items to a child (often two at a time) and noting the child's most frequent choices. Observing a child's choices is often used for children who do not speak or cannot name their preferences. Studies have indicated that choice assessments evaluating a number of potential reinforcers is a valid method for identifying effective reinforcers and should be used periodically because children's preferences may change frequently (Carr, Nicolson, & Higbee, 2000; Love, Carr, Almason, & Petursdottir, 2009). Research on children's self-report of potential reinforcers, however, suggests that self-report is not always an accurate method for identifying effective reinforcers (Northup, 2000; Northup, George, Jones, Broussard, & Vollmer, 1996).

Another procedure for assessing potentially effective reinforcers is to measure the time a child spends engaged (interacting) with items that appear to be highly preferred. Items are presented to the child one at a time and then are ranked according to the duration of engagement. The longer a child interacts with an object, the more likely it is that the object will be an effective reinforcer. This procedure has been shown to be valid and easy to administer (Hagopian, Rush, Lewin, & Long, 2001; Pace, Ivancic, Edwards, Iwata, & Page, 1985).

Applying the Premack principle, *using high-probability (*high-*p) activities as reinforcers*, is a third approach that may be used for assessing reinforcer effectiveness. High-*p* activities are identified by noting which activities a child most frequently chooses in free-play situations with access to a variety of materials. The child is then given access to a high-*p* activity as a reinforcer for a correct response. Instructional progress can be used to confirm or disconfirm whether the activity is an effective reinforcer. Although children may enjoy engaging in some activities for extended periods of time, access to an activity reinforcer can be brief (10 or 15 seconds). Some teachers prompt the child by saying "My turn!," signaling that the child should hand the teacher the play item (or turn away from the activity) and return to the instructional activity. Stereotypy (repetitive movements with or without objects) can also be used as a high-*p* activity reinforcer and may be especially effective if its availability is restricted to when it is provided as a reinforcer (Hanley, Iwata, Thompson, & Lindberg, 2000).

Direct instruction is an effective and valuable component of a comprehensive program for children with autism (Steege, Mace, Perry, & Longenecker, 2007). For direct instruction to be maximally effective, instructional prompts should be individualized, attentional prompts may need to be added, and reinforcement assessments may be used to improve reinforcer effectiveness.

Naturalistic Instruction

As described in Chapter 7, a hallmark of naturalistic instruction (or *milieu teaching*) is providing instruction at times determined by the child's interest (e.g., when the child points to something out of reach, when the child attempts to gain a peer's attention). A premise is that child-determined occasions for instruction are motivating because the child is actively engaged and goal oriented. If the child is highly motivated, naturally occurring reinforcement may be effective. Given that many children with autism are socially isolated and favor consistency, naturalistic instruction is a good fit. Rather than attempting to draw the child's focus to the adult's interest and searching for effective artificial reinforcers, attend to the child's focus and conduct instruction when the child indicates a high level of motivation.

Another advantage of naturalistic instruction for children with autism is that it promotes generalization (Steege et al., 2007). As noted in the introduction to this chapter, children with autism tend to be rigid in their behaviors and routines and have difficulty with generalization. Naturalistic instruction promotes generalization because teaching situations vary considerably: Incidental teaching occasions throughout the day involve different people (children and adults), different activities, different materials, different responses, and

different reinforcers. The variety of stimulus conditions promotes generalization (Stokes & Baer, 1977). In addition, reinforcers associated with naturalistic instruction are likely to be naturally occurring, and thus promote generalization because they are available in noninstructional situations.

Instructional plans for incidental teaching are identical in format to other direct instruction plans, except that *child-determined occasions for instruction* are specified. To implement the plans, teachers or family members follow their typical routines and maintain a watchful eye for the occasions for instruction (e.g., when the child expresses frustration—bangs the toy or whines—after a wind-up toy stops moving). When an occasion for instruction is observed, the adult approaches the child and follows the prompting procedure specified in the instructional plan. The prompt may be to make eye contact with the child and wait 5 seconds (a time delay to encourage communication), it may be to model the expected response ("Help, please"), or it may be another type of prompt (e.g., verbal direction, physical guidance). Correction and reinforcement procedures are also implemented as stated in the instructional plan.

General Case Instruction

As previously discussed, direct instruction is effective with children who have autism because of its consistency and predictability. Although consistency of instruction promotes learning new skills, it may impede generalization, particularly among children who like sameness and orderliness. As noted in Chapter 6, it is critical to develop direct instruction plans that include strategies to promote generalization. Incidental or milieu teaching is one way to promote generalization (discussed above). Another strategy is general case instruction (Kleeberger & Mirenda, 2010). In general case instruction (discussed in Chapter 6), the behavioral objective is stated as a generalized skill; instead of an objective to request a drink of water, for example, the objective is to request a desired item (drink, food, toy, clothing). The skill variations are carefully selected to represent the range of items represented by the general case objective (*request a desired item*) and are taught concurrently rather than sequentially. Other generalization strategies (e.g., teaching across people, places, materials, times; using mediation strategies) may also be included to increase the likelihood of generalization.

Cues

Chapter 6 defined prompting strategies, including cues. *Cues are prompts (anything that helps a child make a correct response) that direct a child's attention to salient characteristics of a stimulus.* For example, an identifying characteristic of an alphabet letter is its shape (salient characteristic) rather than its color (nonsalient characteristic). For a child learning to discriminate a lowercase *b* from a *p, d,* and *q,* salient characteristics include the direction and location of the straight line relative to the circle. A cue that would direct a child's attention to the location and direction of the straight line may be to make the line portion of the *b* bold and to draw it as an arrow pointing up (↑). Cues are a particularly effective type of prompt for children with autism because some children with autism have difficulty attending to multiple and relevant stimulus characteristics. This is known as *stimulus overselectivity* (Lovaas, Koegel, &

Schreibman, 1979; Lovaas & Schreibman, 1971). Providing cues rather than other types of prompts highlights the discriminative characteristics of stimuli that children with autism might otherwise not notice.

Prompt and Cue Fading

Because children with autism prefer consistency, they may become prompt dependent. In other words, they may rely on instructional prompts or cues (and the adults who provide the prompts and cues) even after they have acquired a new skill. Prompt dependency limits independence and generalization. To counteract this tendency, a direct instruction plan should specify steps for fading instructional prompts so that children respond to naturally occurring prompts. Fading is the gradual removal of a prompt by decreasing its saliency (a verbal prompt gradually gets quieter; a pictorial or visual prompt successively gets smaller or lighter), physical proximity (a prompt is gradually moved away from the stimulus), or temporal proximity (the time between a natural prompt and an instructional one is gradually lengthened). If fading is conducted too quickly, errors result or the child does not respond. Therefore it is important that fading be conducted slowly with careful monitoring for errors. If errors occur, the saliency of a prompt should be increased to reestablish correct responding, and a more gradual fading procedure should be conducted.

Group Instruction

Early intervention and early childhood special education services provided to young children with autism tend to emphasize individualized instruction. Often the children are assisted by skills trainers who provide extensive one-to-one instruction for several hours per day in a child's home and sometimes in a child's classroom. Although intense (predominantly one-to-one instruction) intervention has been associated with greater developmental gains for many children with autism compared with less intense programs (Lovaas, 1987; McClannahan & Krantz, 1993; National Research Council, 2001), there is recent evidence that other less intensive interventions focused on communication and joint attention can have significant positive effects (Howlin et al., 2009). Additionally, there is no indication that one-to-one instruction is superior in quality to larger child-to-staff ratios (Strain, Wolery, & Izeman, 1998). Instead, the quality of instruction and the competence of the teachers may be the more important variables.

In addition to one-to-one instruction, all children with autism should receive group instruction. Group instruction is important for children with autism because the diagnosis of autism is based on extensive communication and social needs. The group arrangement provides the necessary context for teaching communication and social skills with peers—a context that is otherwise not available (Leaf, Dotson, Oppeneheim, Sheldon, & Sherman, 2010). Chapter 11 describes several additional benefits of group instruction (e.g., opportunity for observational learning, peer modeling, turn taking) as well as group instructional procedures.

It is important that group instructional arrangements be age appropriate: Infants and toddlers may be in groups for child care and recreation programs

(especially parent–toddler programs), and their groups tend to be small (two to six children or parent–child dyads). Children age 3 and older are frequently in large groups of 20 or more children for child care, preschool, kindergarten, and recreational programs. They may also receive instruction in small groups (three to six children) within the large-group setting.

As noted in Chapter 11, children may need to be taught how to participate in groups and eased into group situations (Carnahan, Musti-Rao, & Bailey, 2009; Collins, Gast, Ault, & Wolery, 1991; Koegel & Rincover, 1974). A child may begin group instruction with just one other child. When she demonstrates progress on her instructional goals and learns basic group-participation skills, such as responding to a peer and sitting quietly while the other child takes a turn, a third child may be added to the group. Additional children may be added to the group, in turn, as the child with autism demonstrates success in the small-group arrangement.

Augmentative Communication

Although augmentative communication is not an instructional procedure per se, it is a support/adaptation that may facilitate speech and language acquisition and reduce problem behaviors (Ganz et al., 2012; Lal, 2010; Schlosser & Wendt, 2008). As noted in the introduction to this chapter, significant communication needs is a defining characteristic of children with autism. Many young children with autism have little or no spoken language and therefore may have a difficult time communicating their desires and needs. Chapter 10 notes that challenging behavior most often serves a communicative function. This implies that problem behavior is occurring because appropriate communication skills are lacking.

Augmentative communication provides an alternative means for children who do not speak to express their wants and needs. As reviewed in Chapter 13, there are a number of augmentative communication systems and modes from which to select, including gestures, sign language, and visual systems (symbols, pictures, and/or photographs) that may be arranged in books, on boards, or on key rings. Electronic devices, including ones that "speak," are also available. Although visual systems in books or on key rings are popular because they are portable and can be understood by a wide audience, one system is not inherently better than another. Indeed, some children will use a combination of systems. The important thing is that all children have an effective means to express themselves. If children are not talking by age 2, they should be taught some form of augmentative communication. Research indicates that augmentative systems do not interfere with the development of speech and may actually facilitate speech (Ganz et al., 2012; Schlosser & Wendt, 2008).

Speech pathologists are important members of the intervention team for children with autism and may be instrumental in developing and teaching a child to use an augmentative communication system. Once a communication mode and system have been selected, instructional considerations mentioned previously in this chapter (direct instruction, naturalistic instruction, general case instruction, cues, and prompt and cue fading) should be incorporated into the instructional plan to teach the child to use the augmentative system. The

Picture Exchange Communication System (PECS) is a pictorial augmentative communication system developed specifically for children with autism. It is described in detail later in this chapter.

Positive Behavior Support

As previously mentioned, children with autism commonly have severe behavioral challenges associated with their communication needs. Chapter 10 describes the positive behavior support model designed to identify the function of problem behavior, prevent the need for problem behavior, teach alternative replacement behaviors (usually communication skills), and eliminate the reinforcement that maintains the challenging behavior. Because it is a communication-based approach (Carr et al., 1994), positive behavior support is particularly well suited to children with autism who often have significant communication needs (Vismara & Rogers, 2010). Positive behavior support strategies should be incorporated throughout a child's day and across the adults and settings the child frequents.

Summary of Instructional Procedures

The eight instructional approaches addressed in this chapter (direct instruction, naturalistic instruction, general case instruction, cues, fading prompts and cues, group instruction, augmentative communication, and positive behavior support) are addressed in detail in other chapters in this text. They are highlighted here because they address one or more of the unique learning characteristics and needs of children with autism. Direct instruction is an effective teaching strategy because children with autism have a learning preference that appreciates consistency. On the other hand, the strong preference for sameness that children with autism tend to have mitigates against generalization. Naturalistic instruction and general case instruction are proven approaches that facilitate generalization during the initial acquisition stage of learning. A preference for sameness also means that prompt fading must be planned and implemented very carefully to ensure independent responding and prevent prompt dependence. Group instruction addresses the social needs of children with autism to develop peer relationships and associated communication skills. And finally, augmentative communication and positive behavior support address the considerable needs that most children with autism have relative to communication and social skills.

SPECIALIZED PROCEDURES FOCUSED ON CHILDREN WITH AUTISM

In addition to the instructional procedures described above and in other chapters, this text presents instructional procedures that have been developed specifically for children with autism. Some are variations of the procedures just described; others are unique. The special procedures described in this section are not exhaustive, but they are ones used extensively with children who have autism. There are five special procedures: 1) discrete trial training, 2) floortime, 3) PECS, 4) visual supports, and 5) peer-mediated intervention.

Discrete Trial Training

Discrete trial training (DTT) is a direct instruction method. It is typically conducted in a one-to-one teaching arrangement in which an interventionist implements a direct instructional plan repeatedly. The repeated trials format is contrary to the earlier recommendations in this chapter that direct instruction be implemented throughout the day at times when a skill is needed, often using naturalistic (milieu) teaching strategies. Although the repeated trials format is associated with generalization concerns, DTT is the foundation of the Lovaas Institute developed and directed by Ivar Lovaas, a leading researcher in the field of autism. The name Lovaas has come to be almost synonymous with DTT. Lovaas has held firm to his belief that DTT should be central to intervention for young children with autism and points to program evaluation data as support for his position (Lovaas, 1987; McEachin et al., 1993). Note that DTT is *not* a comprehensive behavioral intervention program for young children with autism; it is an instructional component of a broader intervention program (Steege et al., 2007).

As indicated, DTT is a repeated trials arrangement of direct instruction. Skills are taught with a consistent delivery of a prompt, correction(s), and reinforcement. When one trial is completed, the next trial begins. It is common to present 10 to 20 trials of DTT per skill. If a child is being taught to recognize his printed name, for example, two cards are placed on a table in front of him, one with his printed name and one with another name. The child is prompted, "Timmy, point to your name." When Timmy points to his name (with or without additional prompts), he is reinforced as indicated in the instructional plan. The two cards are then rearranged in front of Timmy and the instructional plan is implemented again. This process is repeated until the specified number of trials has been conducted.

Although recommended practices for children with severe disabilities include more naturalistic trial arrangements with instruction occurring throughout the day and embedded in meaningful activities (Barton et al., 2012), there may be situations when the repeated trials format of DTT would be more effective than the distributed trial arrangement. Bambara and Warren (1993) suggested that repeated trials are well suited to shaping new behaviors. Over successive repeated trials, the adult or teacher can gradually modify and reduce prompts, requiring that the child perform the skill with increasing independence. It is also easier to ensure that a sufficient number of trials are conducted each day and that instruction is implemented consistently when a repeated trials format is used. Another advantage of repeated trials for children with autism is that they fit with learning styles that are characterized by orderliness and consistency.

DTT may be a primary method of instruction for some children with autism. However, it is essential that strategies for generalization be implemented for all instructional objectives. The highly systematized and consistent nature of DTT may facilitate initial skill acquisition, but it will also hinder generalization. Strategies such as naturalistic instruction (milieu teaching), general case instruction, and other generalization techniques (e.g., mediate generalization, use of naturally occurring reinforcers; see Chapter 6) must be implemented concurrently with DTT.

Floortime

Floortime is the cornerstone of the developmental, individual-difference, relationship-based (DIR) intervention model for young children with autism (Greenspan & Wieder, 2006). The DIR model and floortime procedures emphasize following a child's lead to establish communicative interactions, building social relationships, supporting affective development, and facilitating sensory development. This approach is in clear contrast to the DTT model, which is highly directive and controlled by the teacher. In floortime, the parent or teacher attempts to enter the child's world by joining the play or activity initiated by the child. In contrast, the objective of DTT is to shift the child's focus from her own world to the world beyond herself by attending to the adult or teacher, following directions, and participating in activities initiated by the adult or teacher.

Parents are often the primary interventionists in conducting floortime because the strategy is designed to build or strengthen a child–adult relationship—a relationship that is often weak or severely lacking when the child has autism. Floortime sessions are typically conducted for 20 to 30 minutes, 8 to 10 times per day, with the overall amount of intervention varying from 10 to 25 hours per week (Schertz & Odom, 2004). Floortime is conducted by first observing the child and deciding how to approach and enter the play. In observing the play, the child's emotions and temperament are noted. Next, the adult approaches by acknowledging the child's emotional states and interests ("You are excited about collecting your dinosaurs and putting them all in the same place"). The adult may then enter the child's play by assisting with the activity, being careful to let the child direct the course of events and set the emotional tone. The adult can also extend and expand the child's play, making supportive comments and being careful not to be intrusive. Supportive comments may be descriptive of the activity ("I think you've found all the dinosaurs") or tone ("You are so happy to have the dinosaurs all together!") and may include statements or questions that clarify and support creativity ("The dinosaurs seem happy to be together. Can other animals join them? Which ones? Now that they are all together, what are the dinosaurs going to do next?"). When the child responds by building on the adult's comments, he closes the *circle of communication*. The child's responses may be verbal ("The dinosaurs are family. They live together.") or nonverbal (the child picks up a dinosaur, looks at its face, smiles, and makes the dinosaur dance). It is up to the adult to follow the child's lead, enter the play again, and open a new circle of communication. The floortime strategy can be used with functional and/or socially influenced play, as well as perseverative, stereotypic play. In addition, floortime can be conducted even if a child says "no" by commenting and building on the child's mood and response ("You don't want anyone else to touch your dinosaur." "Should I put it back?" "Where should I put it?").

In addition to following a child's lead and expanding on her play, floortime can include adult responses that 1) obstruct the child's play and create problems to be solved; 2) introduce symbolism (pretend play with objects, dress-up, puppetry); 3) develop abstract thinking by talking about feelings, alternative outcomes to problem situations, a wide range of real and pretend topics, and asking questions ("why" questions, opinions); and 4) develop motor planning

skills by helping children learn to "undo" situations (uncover a hidden toy, fix a mistake with a puzzle) and engage in multiple-step activities. Typically, the adult challenges the child gently with attempts to open communication circles and responds empathically and supportively to the child's mood and reactions.

Picture Exchange Communication System

For many children with autism, understanding the meaning and use of language is a primary communication concern. Language meaning, or *semantics*, requires a cognitive understanding of objects, actions, and how the environment "works." Language use (or *pragmatics*) involves social knowledge and includes skills such as conversational turn taking and using words and a voice tone appropriate for the social rules of the situation. Pragmatics also includes an understanding that language is a communication tool used to accomplish objectives. For example, if we are thirsty we use language to ask for a drink of water, or if we don't understand something, we ask for clarification. Some children with autism have speech that is limited to *echolalia*, repeating what others say to them apparently without understanding the communication. In other situations, children with autism memorize phrases and sentences from observation of others or DVDs, television, and other media. Some of these children use the memorized phrases and sentences appropriately to comment while playing or to respond to others' comments and questions. Sometimes only the adults most familiar with the child (parent or skills trainer) recognize the origins of the language. Although these children have difficulty generating novel communications (and this ultimately restricts their communication abilities), they demonstrate functional levels of semantic and pragmatic skills because they can use the phrases and sentences effectively.

PECS is an augmentative communication approach designed to address the semantic and pragmatic communication needs of children with autism (Frost & Bondy, 1994). PECS uses photographs or simple line drawings to create communication books and schedules. Children use the pictures and symbols to communicate by removing them from the book or schedule and handing them to an adult. For example, a child may take a "breakfast" picture (line drawing showing bowl and cup) off the daily schedule and hand it to her mother as they walk to the table for breakfast. When breakfast is finished and the child needs to wash up for school, she returns to the schedule, places the breakfast picture on it, removes the bathroom picture, and hands it to her parent. By using the communication pictures and symbols in a schedule, a child learns that symbols have meaning. Concurrently, the PECS schedule helps the child learn daily routines and expectations. This creates meaning and expectations in the child's life and establishes a context for communication. Although the child may not initially comprehend the word "breakfast," following repeated use of the PECS breakfast symbol she may come to understand that the symbol means it's time for the morning meal.

The PECS program is detailed in a training manual and uses basic behavioral intervention techniques, such as shaping and reinforcement, for instruction (Frost & Bondy, 1994). Children are first taught to use individual pictures to initiate a request. To avoid prompt dependency and promote initiations,

verbal prompts are not used. The program then builds vocabulary and sentence structure, beginning with the simple grammatical form "I want _____." Children are also taught to comment and respond to questions. PECS is used widely and regarded as an effective and worthwhile program (Boyd et al., 2010; Siegel, 2000; Vismara & Rogers, 2010; Yamall, 2000). Although there are a number of published reports describing its effectiveness (Bondy & Frost, 1993, 1994; Peterson, Bondy, Vincent, & Finnegan, 1995; Schwartz, Garfinkle, & Bauer, 1998), experimental data supporting its use are just beginning to emerge in the literature (Charlop-Christy, Carpenter, Le, LeBlanc, & Kellet, 2002; Yoder & Stone, 2006a, 2006b).

Visual Supports

As noted, many children with autism respond better to visual than to auditory stimuli. Recognizing this characteristic, picture schedules have been used to teach children with autism to transition from one activity to the next (Boyd et al., 2010). Picture schedules may be created as a list of the day's activities noted in both words and photos or line drawings. The adult reviews the list with the child before beginning the set of activities and then draws the child's attention to the list again as one activity ends and the next is to begin. Sometimes, as described earlier in this chapter, a picture schedule is used in conjunction with PECS. In using a PECS picture schedule, a child removes the corresponding PECS symbol at the beginning of the activity and then returns it to the schedule at the conclusion of the activity. The remaining PECS symbols are removed and returned to the schedule successively as the child proceeds through the day's activities. Visual cues have also been successfully used to teach children symbolic play and social-communication skills.

Peer-Mediated Intervention

Teaching peers without disabilities to promote communication and social skill use among children with disabilities is referred to as peer-mediated intervention. The effectiveness of these procedures has been demonstrated in inclusive early childhood settings since the late 1970s (Ragland, Kerr, & Strain, 1978; Sperry, Neitzel, & Engelhardt-Wells, 2010) and are discussed in detail in Chapter 12. The procedure is to teach young children without disabilities to initiate interactions with their peers with autism ("Sherry, I have the blocks. Please play with me.") or to be responsive to interaction attempts (responding with "Hi Sherry! Do you want to share my snack?"). For children with autism who rarely initiate or respond to their peers, peer-mediated interventions support the reciprocal nature of social interactions and are, therefore, a crucial component of inclusive programs serving young children with autism (Odom & Strain, 1986).

MODEL PROGRAMS FOR CHILDREN WITH AUTISM

While research-supported instructional techniques are a critical component of early childhood education for young children with autism, many have significant needs that are best addressed through a comprehensive intervention program. Seven exemplary programs for children with autism are described

here. These programs were selected because they represent a growing number of well-established interventions, are supported with program evaluation data and/or experimental data, and represent comprehensive approaches to addressing the needs of children with autism (Odom et al., 2010). Note, however, that no single program is universally effective for all children with autism (Howlin et al., 2009; Reichow & Wolery, 2009). Three of the seven programs are inclusive early childhood programs.

1. Learning Experiences and Alternative Program for Preschoolers and their Parents: LEAP

2. Developmental, Individual-Difference, Relationship-Based Approach: DIR

3. Developmentally Appropriate Treatment for Autism: Project DATA

4. Treatment and Education of Autistic and Related Communication Handicapped Children: Project TEACCH

5. Lovaas Institute

6. Pivotal Response Training

7. Denver Model

LEAP, Project DATA, and a part of the Denver Model called Early Start are inclusive early education models. Project TEACCH is a model that can be implemented in segregated or inclusive settings. Lovaas Institute, Pivotal Response Training, and DIR are usually conducted in segregated settings (at least initially).

There is consensus that intervention for children with autism needs to start early (often before a child is 2 years old) and must be fairly intense (sometimes 30 to 40 hours per week) (Strain et al., 1998). A key difference among the model programs is the extent to which the intervention approaches are intrusive or nonintrusive. An intrusive program is one requiring that the child attend and follow the instructions of the adult or teacher. Nonintrusive approaches attempt to enter the child's world and capture his attention without interference or upset. Two behavioral models, the Lovaas Institute and Pivotal Response Training, are fairly intrusive models. Project TEACCH is less intrusive, and the DIR model is perhaps the least intrusive approach.

Learning Experiences and Alternative Program for Preschoolers and Their Parents: LEAP

LEAP, an inclusive early childhood education model, was developed in 1981 by Strain et al. at the University of Pittsburgh and implemented in public school settings (Strain, Barton, & Dunlap, 2012). It was the first inclusive public-school-based model for young children with autism. LEAP includes intensive behavioral, data-based interventions and develops strategies to promote child engagement in activities and with peers. The peer-mediated interventions described in the previous section of this chapter and in detail in Chapter 12 were developed through LEAP. The model is now well established and has been replicated numerous times (Strain & Bovey, 2011). Replications begin in typical preschools by first establishing high-quality preschool instruction for typically

developing children (several different early childhood curricula have been used in the replication sites). In addition to peer-mediated intervention, key features of the model include incidental instruction on individual education program objectives embedded into daily routines and activities and extensive family training focused on the behavioral needs of the children with autism in home and community settings. Recent research indicates that LEAP has strong empirical support and meets the stringent criteria of being an evidence-based practice (National Research Council, 2001; Odom et al., 2010; Strain & Bovey, 2011; Vismara & Rogers, 2010).

Developmental, Individual-Difference, Relationship-Based Approach: DIR

The floortime procedures reviewed earlier in this chapter were developed through the DIR model, designed by Stanley Greenspan at the George Washington University Medical School in the District of Columbia (Greenspan & Wieder, 2006). The DIR model focuses on broad developmental areas of need—such as emotional development—rather than on specific skill needs or skill areas, as in the Lovaas Institute program and Pivotal Response Training. Greenspan views autism as a multisystem regulatory disorder affecting sensory processing, reactions to stimuli, and the forming of relationships.

The focus of DIR is on nurturing the child's development of self and self-expression. Individualized intervention plans are designed based on an assessment that produces a functional developmental profile. The profile indicates a child's strengths and needs related to emotional development; sensory, modulation, processing, and motor planning; and relationships and interactions. An individualized plan for a child is comprehensive and includes floortime (following the child's lead; problem-solving activities; motor and sensory activities); speech therapy; sensory integration therapy (occupational and/or physical therapy); a daily educational program (inclusive program when possible); perhaps biomedical intervention (e.g., medications that might help a child's attending); and a consideration of nutrition, diet, and other programs designed to improve sensory motor skills.

Developmentally Appropriate Treatment for Autism: Project DATA

Developed by Ilene Schwartz and her colleagues at the University of Washington, Project DATA is a model program designed to merge recommended practices in early childhood education with those in early childhood special education and autism (Boulware et al., 2006). Unlike the other model programs, the central feature of Project DATA is a high-quality, inclusive early childhood program designed in accordance with developmentally appropriate practice (see Chapter 1). Children with autism attend the early childhood program for approximately 12.5 hours per week. Individualized instruction is provided by embedding the instruction in the ongoing classroom activities and routines. Strategies that promote generalization and maintenance are also implemented in regular classroom activities. The other components of Project DATA were developed to support the success of each child with autism in the inclusive early childhood program. These support components include

1) extended instructional time, 2) technical and social support for families, 3) collaboration and coordination across services, and 4) transition support. Extended instructional time provides approximately 8 additional hours per week of individualized intensive services focused on each child's individual needs. Intensive services may include a range of effective approaches such as DTT, naturalistic instruction (milieu teaching), and embedded instruction. Technical and social support for families consists of monthly home visits, resource coordination (e.g., child care, parent support groups, community services), parent support and networking get-togethers, and a father's evening. Collaboration and coordination across services helps facilitate communication among professionals who provide services to the family and/or child but are not a part of Project DATA (e.g., a family may hire a speech therapist for their child). And finally, transition support involves strategies to assist the family and child as the child exits Project DATA and enters a new school (often a public school).

Treatment and Education of Autistic and Related Communication–Handicapped Children: Project TEACCH

Project TEACCH was developed in the early 1970s by Eric Schopler at the University of North Carolina at Chapel Hill (Mesibov, 2005). TEACCH is a statewide program serving infants through adults with autism and their families in North Carolina. The model utilizes a combination of approaches to design an individualized program based on a child's skills, interests, and needs. Intervention approaches are selected to fit with the culture of autism or the learning preferences of many individuals with autism; for example, a preference for sameness and consistency or a preference for visual prompts rather than verbal ones. Individual programs designed through Project TEACCH emphasize altering the environment to accommodate the characteristics of a child (e.g., allowing a child to maintain orderly arrangements of items), using visual organizers (e.g., picture schedules), implementing work systems (e.g., daily work organized in baskets), and providing direct instruction. More so than the model programs discussed thus far, TEACCH includes a family support component and considers aspects of an individual's life beyond independent work skills (e.g., communication, social, leisure areas). As noted above, TEACCH can be implemented in segregated or inclusive settings (Carnahan, Harte, Schumacher, Hume, & Borders, 2011).

Lovaas Institute

Developed by Ivar Lovaas in the 1960s at the University of California–Los Angeles, the Lovaas Institute (also known as the Young Autism Project) has the longest history of the programs described here. Without question, it is the program with the largest database. As noted earlier, DTT is the central feature of the program. DTT procedures, data collection strategies, scheduling and implementation recommendations, and programs (i.e., lessons) are fully described in a published manual (Lovaas, 2002). Instruction covers 15 areas, all of which are addressed within a year's time. Program areas focus on self-help, early academics, and communication skills and include the following: establishing cooperation with simple requests; matching and sorting;

early receptive language; nonverbal imitation; play skills; verbal imitation; receptive labels; arts and crafts; self-help skills; expressive labels; reading and writing; color, shape, and size; "I want, I see, I have"; prepositions; and emotions. Most of the intervention is conducted in a one-to-one situation, with the child and the interventionist seated across from each other. Following 6 to 12 months of intensive one-to-one intervention, Lovaas recommends that children gradually be moved into nursery or preschool programs with an individual assistant.

Lovaas has reported that nearly half of the children with autism who participated in the Lovaas Institute have "recovered" (Lovaas, 1987; McEachin et al., 1993). He defined recovery as having an adequate IQ and the ability to participate in mainstream education. There has been much controversy in response to the Lovaas data and the claims of recovery (Mesibov, 1993; Schopler, Short, & Mesibov, 1989), with most of the criticisms and questions focused on the manner in which participants were selected (i.e., were they representative of most children with autism, or were they primarily children with mild autistic characteristics?) and the outcome measures (i.e., do the assessment tools adequately measure the most important behavioral concerns of children with autism?). A recent evaluation of the Lovaas Institute program across 12 samples of children yielded mixed results, including the failure of some children to benefit from the program (Howlin et al., 2009; Reichow & Wolery, 2009). Despite the controversy and limitations, there is widespread agreement that children who participate in the program frequently make substantial skill gains (Eldevik et al., 2009).

Pivotal Response Treatment

The pivotal response treatment model (Koegel & Koegel, 2012) developed by Lynn and Robert Koegel and their colleagues at the University of California–Santa Barbara is an outgrowth of the Lovaas Institute. The Koegels worked with Lovaas in the 1970s and developed their model to address what they believed were some of the shortcomings of the Lovaas Institute, primarily the artificial nature of the intervention situation, the appearance that children were unhappy during DTT, and issues with generalization. The Koegels believed that children with autism could be self-motivated. Their model uses behavioral procedures (direct instruction) and provides intervention in the context of play and functional activities. Child choice is incorporated throughout the model. They have also built a theoretical framework that defines and provides a rationale for identifying *pivotal responses,* key skill areas that can greatly enhance the overall development of children with autism. Pivotal response areas are the core of their approach.

Pivotal responses refer to skill areas that, when acquired, produce "large, collateral improvements in other areas" (Koegel, Koegel, Harrower, & Carter, 1999). The model is described as an efficient intervention approach because it targets skills that affect wide areas of functioning and does not simply teach a series of isolated skills. Pivotal response areas were identified as key areas for intervention because they are typically high-need areas for children with autism. There are four pivotal response areas: 1) responsivity to multiple cues, 2) motivation, 3) self-management, and 4) self-initiations.

Responsivity to multiple cues, the first pivotal response area, addresses stimulus overselectivity, a characteristic of many children with autism. Stimulus overselectivity means that a child has difficulty attending to multiple cues and instead focuses on a limited number of stimulus features or characteristics, often irrelevant ones. While a teacher is providing instructions for a new activity, for example, a child with stimulus overselectivity is focused on the buzzing of a fluorescent light. Stimulus overselectivity results in serious difficulties in acquiring social and language skills and a failure to generalize, because the children do not attend consistently to their social world. In pivotal response training, direct instruction is used to highlight relevant stimulus characteristics and requires that a child respond to multiple cues.

Motivation, the second pivotal response area, is evident when a child responds often and quickly to instruction and shows indications of positive affect, such as interest, enthusiasm, and happiness. Increases in motivation have been associated with decreases in disruptive behaviors. Motivational strategies include providing choices throughout the day, using natural and functional reinforcers (rather than artificial ones), interspersing maintenance trials (practice with previously acquired skills) with acquisition trials, and reinforcing attempts.

The third pivotal response area is *self-management.* It is considered a critical skill for success in inclusive environments. Self-management includes the child setting goals and selecting reinforcers, self-monitoring progress, and requesting reinforcement when appropriate. The self-monitoring strategy used to teach children to be aware of their own behavior is gradually faded, and the generalization of self-monitoring to natural environments is assessed.

The fourth pivotal response area is the communication skill of *self-initiation.* It refers to spontaneously asking questions, seeking information, and initiating conversations. Such skills are often lacking in children with autism but are critical for learning in natural environments without adult intervention.

Denver Model

The Denver Model and the Early Start Denver Model—a counterpart for toddlers—are inclusive intervention models that adhere to a framework that integrates applied behavior analysis, the developmental model, and a relationship-based approach (Dawson et al., 2010; Rogers & Dawson, 2009). Intervention is intensive and applies ABA principles to teaching skills of joint attention and engagement, interpersonal interaction, and verbal and nonverbal communication. There is also a strong parent-training component. The model follows an interdisciplinary approach, including speech, occupational, and physical therapists, to address children's needs across the range of developmental areas. Intervention occurs in natural environments, such as the home and inclusive preschool settings. A recent controlled experimental study of Early Start was conducted with children beginning the program before age 2.5 years. Compared to children with autism in existing community programs, children in the experimental group made significant improvements on measures of intelligence, adaptive behavior, and language, and children in the experimental group were significantly more likely to have an improved status on measures associated with the severity of their autism diagnosis (Dawson et al., 2010).

SUMMARY

Autism is a diagnosis based on social and communication difficulties, an obsession with sameness and/or stereotypy, and self-stimulation. These unique characteristics have implications for instruction. This chapter reviewed several instructional approaches described elsewhere in this text that have been shown to be effective with children who have autism. These strategies include 1) direct instruction, 2) naturalistic instruction, 3) general case instruction, 4) cues (versus general prompts), 5) prompt and cue fading, 6) group instruction, 7) augmentative communication, and 8) positive behavior support. They are highlighted here because they address the unique educational needs of children with autism and are well suited to the learning styles of most children with autism. In addition, DTT, floortime, PECS, visual supports, and peer-mediated intervention were described—five instructional approaches developed specifically for children with autism. The chapter concluded with descriptions of seven model programs: LEAP, DIR, Project DATA, Project TEACCH, Lovaas Institute, Pivotal Response Treatment, and the Denver Model.

•••••••••••••••••••••• STUDY QUESTIONS ••••••••••••••••••••••

1. Describe the learning characteristics of children with autism. For each characteristic you identify, discuss the ways (positive and negative) that it might affect learning.

2. Briefly describe the eight general instructional procedures (direct instruction, naturalistic instruction, general case instruction, cues, prompt and cue fading, group instruction, augmentative communication, positive behavior support) reviewed in this chapter. Describe why each of these procedures may be important to providing effective instruction for children with autism.

3. Define *discrete trial training (DTT)*. Discuss the pros and cons of using this procedure.

4. What is *floortime*? Compare and contrast it to DTT.

5. Describe how you might use PECS to help a 4-year-old child with autism who doesn't speak to participate in an inclusive preschool classroom.

6. Define and describe the four pivotal response areas of the *pivotal response treatment program*. Propose an intervention strategy to teach a skill in each of the four areas.

7. Discuss several ways that Project DATA merges recommended practices for children with autism.

8. Drawing from previous chapters that have discussed culture and learning, discuss cultural issues that might affect parents' receptivity to each of the model programs for children with autism.

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