Methods for Teaching Students with Autism Spectrum Disorders: Evidence-Based Practices is our attempt to introduce the professional knowledge and skill competencies that teachers need in serving individuals with autism spectrum disorders (ASD) across the age span into young adulthood. This introduction and methods textbook provides an overview of the etiology and characteristics of ASD and introduces evidence-based practices in the education of persons with ASD. The application of these practices is explored across three critical periods in the lives of children and families that include early childhood, the school years, and moving from school to adult life. The text examines how evidence-based practices are applied in identification and early intervention, when teaming with families, teaching communication skills, promoting social competence, building school-based behavioral repertoires, engaging in collaboration and consultation, developing academic skills, fostering self-determination, transitioning to adulthood, and enhancing quality of life.

This book is timely given the increased need for building capacity to address the educational and life support needs of persons with ASD. More teachers and related service professionals trained in the field of autism are needed, and increased competencies on the part of special and general educators are becoming a growing priority. This book attempts to provide preservice and in-service teachers and related professionals with an understanding of how to teach students with ASD across educational settings and within specific content areas.

Organization of the Text

The book is organized into four sections. Section I, “Introduction” is intended to provide students with a broad overview and understanding of autism spectrum disorders (ASD). The origins of ASD, causes, and etiology are presented as a brief history of autism and in terms of the treatment models that have been most commonly used. Finally, this section presents students with an introduction to evidence-based practices used in the education and treatment of ASD and presents a decision model for professionals to use in their work. Section II is directed toward the early childhood years, the importance of screening and early identification, and the importance of early intervention and partnering with families in the design and delivery of interventions. Section III examines the school years for children with ASD and explores relevant areas such as building behavioral repertoires needed for success in school, collaboration and consultation among professionals and families, and the development of academic skills. The final section, Section IV, targets the transition to postschool settings for these students and presents material on building self-determination skills, the key elements associated with transition planning and meaningful postschool outcomes, and the importance of quality of life for adults with ASD.
New! Pearson eText Available

To enhance affordability and portability this exciting new edition is available as a Pearson eText. With the eText students can easily take and share notes, highlight, and search for key concepts. To learn more about the Pearson eText, go to www.pearsonhighered.com/etextbooks.

Acknowledgments

We would like to sincerely thank all of our colleagues at Pearson/Merrill who have provided us with continued support and direction on this project. Thank you to Steve Dragin, our editor, who has provided us with guidance and leadership throughout this creative process, and to Annette Joseph and Carrie Fox for helping us shepherd the project through to completion. We would also like to thank the reviewers who shared their expertise in providing us with guidance in the development of the text: Jonna L. Bobzien, Old Dominion University; Stacy L. Dean, University of Virginia; Tina T. Dyches, Brigham Young University; Katherine C. Holman, Towson University; and Kathi Wilhite, East Carolina University.

And, finally, our heartfelt thanks to our families for their continued love, support, and encouragement that made the completion of this text possible. In closing, we hope that this text will serve a need in the preparation of those serving persons with ASD and their families.
CHAPTER 1

Understanding Autism

CONCEPTS TO UNDERSTAND

After reading this chapter you should be able to:

■ Describe the characteristics of autism.
■ Discuss the importance of early detection and identification of autism spectrum disorders (ASD).
■ Discuss the role of early intervention in the treatment of young children with ASD and the importance of family partnerships.
Section I / Introduction

- Describe the concept of longitudinal education planning (LEP) as a method for devising long-term treatment and educational programming for children with ASD.
- Discuss the approaches most commonly used in the treatment of ASD.
  - Applied behavior analysis
  - Naturalistic
  - Developmental
  - Multi-component
  - Sensory integration training
  - Medical and alternative health approaches

Chapter 1 Mind Map

Autism is a complex neurodevelopmental disorder with no precise cause. This means that autism involves an impairment of the brain in a way that can be observed through the behavior and emotional characteristics of a person. Currently 1 in 50 children are affected by autism (Blumberg et al., 2013), with the risk for boys being nearly five times greater than for girls. Autism occurs during childhood, and therefore can have an impact on how a child develops and matures. There have been several proposed reasons for what causes autism, but there is currently no clearly known cause for the disorder.

Autism ranges from mild to severe and impacts the degree to which a person’s development is impaired. Those individuals who are higher functioning on the autism spectrum may: display only minimal impairments in their intellectual processes, experience some motor difficulties, have an obsession with a particular area of interest, have difficulty understanding and communicating feelings such as humor or empathy, have an inability to discern subtle cues, have difficulties with pragmatic or functional language, and have a hypersensitivity to certain noises, light, smells, and textures found in clothes or food. Individuals with more severe forms of autism can have intellectual impairments; significant language delays or be nonverbal; engage in stereotypical behavior such as hand flapping, pacing, rocking; or aggressive behavior toward themselves or others.

Leo Kanner (1894–1981) was an Austrian born psychiatrist who published a well-known paper entitled “Autistic Disturbances of Affective Contact” (Kanner, 1943). His
CHAP TER ONE / Understanding Autism

paper provided detailed case studies of 11 children with whom he worked. Kanner was the first to describe children with autism in the research literature. Kanner's study documented in great detail the behavioral characteristics of these children, including their insistence on sameness, their obsession with routine, their desire to be alone, and their language and communication difficulties, including, in some children, their lack of speech or presence of echolalia (e.g., repeating words, phrases, or sentences that they have heard).

Before Kanner's case study, children and adults with autism were mislabeled as either having some form of mental illness or intellectual disability, as no previous work in the area had been conducted. Kanner believed that all of the children with autism in his original treatment group were of normal intelligence, largely because these children did not display the same characteristics of children with mental retardation. Kanner’s views supported the theory of the day that held to the belief that autism was of a psychological origin rather than a developmental disorder.

Causes of Autism

Currently many theories exist as to the causes of autism, but to date there is no consensus as to one specific cause to explain this complex disorder. Experts point to genetic influences that may leave some children predisposed to developing autism; research into the role of genetics and autism is ongoing. Many authorities believe that the limitation of the genetic theory is that although genetic differences have been linked to autism, they account for only a minimal number of total cases (Landrigan, 2010). In fact, Landrigan (2010) cites numerous examples from the literature where children diagnosed with autism have a high co-occurrence of autoimmune disorders, pointing to involvement beyond the neurological system. The extent of the relationship of autism spectrum disorders to autoimmune disorders remains unclear, yet Persico, Van de Water, and Pardo (2012) point to the role of the immune system in early neurodevelopment, where these systems interact through the release of neurochemicals that bridge communication between the immune and nervous systems during early development.

Other theories on causation include the relationship of environmental toxins with the pre- and postnatal development of infants and toddlers. One controversial theory along these lines was the role of immunizations containing Thimerosal (a mercury-based preservative once used to prevent bacterial and fungal contamination in vaccines) and the relationship of the measles, mumps, rubella vaccine to autism. Independent research has not demonstrated any evidence at all to support these claims, though it has received a great deal of media attention. Because there is no clear scientific evidence to confirm a specific cause–effect relationship between these theories and the onset of autism, public speculation remains rampant, as many parents still remain open to numerous possible factors that could cause autism. A subsequent development regarding the possible link of vaccines to autism was the ruling by the U.S. Court of Appeals for the Federal Circuit Court who, on August 27, 2010, upheld a ruling denying a link between vaccines and autism (Shaw, 2010).
Despite the lack of empirical evidence to support these relationships, many parents remain resistant toward obtaining vaccinations for their children due to the fear that their child will have adverse reactions that will result in the onset of the disorder. For many families affected by autism, legal findings do not remove the lifetime of challenges they may likely face in addressing this condition. As one might expect, there has been a considerable amount of controversy surrounding the validity of these theories, as the general public seeks answers to explain the origins of autism and the reason for its increasing global prevalence.

Research continues to increase as scientists try to identify the cause(s) of autism. New evidence continues to emerge that suggests an interaction between environmental and biological factors paired with genetic mutations that may affect development and result in the diagnosis of autism in some children (Altevogt, Hanson, & Leshner, 2009). This aligns with the theory that some children have a genetic susceptibility and, when paired with exposure to agents such as environmental toxins, a threshold is exceeded and atypical development ensues consistent with the diagnosis of autism (Jepson, 2007). See Figure 1.1 to better understand this interaction. More research in this area is needed to ascertain the precise relationship of these variables and their interactive effects on the development of young children.

**Autism Spectrum Disorders (ASD)**

Autism was for many years considered to be one of five disorders characterized as a pervasive developmental disorder (PDD), as defined by the *Diagnostic and Statistical Manual of Mental Disorders* (4th edition), or *DSM-IV*, published by the

![Figure 1.1 Diagram of interaction between genetic susceptibility and environmental toxins](image-url)
American Psychiatric Association. Pervasive developmental disorders were defined by delays in social-communicative development and include autism, pervasive developmental disorders not otherwise specified (PDD-NOS), Asperger’s syndrome, Rett syndrome, and childhood disintegrative disorder (CDD). Autism spectrum disorders is now the correct term as recognized by the Diagnostic and Statistical Manual of Mental Disorders (5th edition). The term autism spectrum disorders is inclusive of a range of autism or autism-related symptoms from mild to severe forms on the spectrum.

Autism has become a growing health concern globally in recent years given the increase in prevalence rates. With the increased prevalence, educational and health care systems must be prepared to address the educational and health care needs of the growing population of children, youth, and adults identified with ASD and the long-term implications in terms of service delivery systems. It has been estimated that the costs to society exceed $35 billion in direct and indirect medical and nonmedical costs to care for all individuals each year across their lifetimes (Ganz, 2007), not to mention the emotional and human costs in terms of quality of life challenges faced by the children and families affected by this condition.

Increased Prevalence Rates

A question that many are asking is why there is a continued increase in the number of children being identified with autism. It has been speculated that a number of factors should be considered to help explain the rise in the numbers of children identified. These include the refined assessment methods now being used, which allow professionals to be more adept at identifying the disorder earlier in the life of a child; a broader definition of autism, which is now inclusive of a spectrum of disorders; and greater public awareness that has, in turn, made families, educators, and physicians (such as pediatricians) more attuned to the symptoms of ASD, making it more likely that a young child who may be exhibiting atypical patterns of development consistent with autism will be identified. The importance of early detection and diagnosis is crucial in order to develop early intervention treatments aimed at minimizing the impact of the disorder on the future development of the child.

Importance of Early Detection

Given the fact that autism has no obvious physical characteristics, if parents are concerned about their child’s behavior and development, a developmental screening should be conducted to ensure the child is not exhibiting characteristics consistent with autism.

Because autism has garnered much of the media spotlight in recent years, the general public has become more aware of the importance of early detection and
Section I / Introduction

Diagnosis of young children with autism. There is evidence to suggest that children can be diagnosed with autism before the age of 24 months, yet there has not been an instrument designed for this population of children. Stone, McMahon, and Henderson (2008) have developed the Screening Tool for Autism in Two-Year-Olds (STAT), which is designed to assess the social and communicative behavior of these children across the domains of play, imitation, and communication. Parents usually first consult the child’s pediatrician if they have concerns about their child’s development, with pediatricians regularly conducting developmental surveillance at well-baby visits from infancy through early childhood.

In an effort to better inform pediatricians of the symptoms associated with autism, the American Academy of Pediatrics developed a series of materials to support primary care physicians in the early identification of autism (Johnson & Myers, 2007). Some early developmental signs to be concerned about are illustrated in Figure 1.2. Should a toddler display these characteristics, it would be most advisable for parents to schedule an appointment with their pediatrician.

### Diagnosis and Treatment

If children are suspected of having autism following the screening process, a psychoeducational evaluation is conducted for the purpose of determining the diagnosis of autism. The evaluation is also aimed at identifying the child’s individual learning strengths, the areas of greatest need, and to assist in the design of evidence-based interventions and supports to assist the child and family. The psychoeducational evaluation process typically involves a team of professionals that most often includes a psychologist, behavior analyst, speech/language pathologist, special education professional trained in autism, occupational therapist, and physical therapist. Figure 1.3 provides an illustration of how these professionals might typically be involved in this process.
It is not uncommon for children and their families to seek the assistance of medical specialists, which may include pediatric neurologists, developmental pediatricians, child psychiatrists, and geneticists, should they be available to consult with parents concerning their child’s development. This is often the case with clinics that are affiliated with universities and medical schools, where specialists are accessible and can be involved in the evaluation process.

The evaluation process allows for team members to share their expertise and gather information about the child and his/her family through informal and formal means. Informal measures, such as parent interviews, are conducted, as are a battery of more formalized assessments aimed at identifying the child’s levels and abilities in the areas of cognitive functioning, social behavior, speech/language and

**FIGURE 1.3 Multidisciplinary evaluation team members**
communication, adaptive behavior, motor skills, and performance. More importantly, the comprehensive evaluation seeks to capture as complete a picture as is possible of the child and family to better aid in determining the diagnosis of autism. Of equal importance, however, is the design of educational and lifestyle supports to assist the family. This process seeks to better understand the child’s developmental history, the environments that comprise the life of the child and his/her family, and the strengths and support needs of the child and family. A child’s social and behavioral dimensions are also very important in the diagnosis of autism. Autism generally consists of core deficits in the areas of cognition and executive functioning (the cognitive ability to connect past experiences in our lives with present day events), an area with which children with ASD have difficulty; challenges in the areas of social emotional development and feelings; and problems with attention and imitation (Schreibman, 2005). It is important to recognize the significant role that early detection and diagnosis play in addressing these deficits. Researchers point to behaviors during the first year of life that are highly correlated with the later onset of autism.

The Role of Early Intervention

Once families learn that their child has been diagnosed with autism, it is important that they obtain the support and assistance of skilled early intervention professionals who are family centered. Early interventionists are educators and therapists trained to assist young children and families in the design and delivery of educational and related supports aimed at improving the quality of life for all. Family-centered professionals believe in partnering with parents and families and solicit input from parents and families, acknowledging the important role they play in the life of their child.

Early intervention allows for home- and/or center-based services and supports as mandated by the Individuals with Disabilities Act (Part C). These services are part of the individualized family service plan (IFSP). The IFSP is a document that outlines the services and supports that a child and family will receive. Note the importance on the family; early intervention is geared toward the family and recognizes their prominent role in the life of their child, and thus they are viewed as partners in the IFSP planning and implementation process.

The IFSP includes statements relative to the following:

1. The present level of functioning of the child in terms of physical, cognitive, social/emotional, communication, and adaptive behavior levels
2. Family information, including the needs and resources and concerns of the parents and family members involved in the care and support of the child
3. The services that the child and family will receive and the expected outcome measures based on these services
4. The location(s) in which the services and supports will be provided, be they the home or natural environment or the community, and if services should not be
provided in the child’s natural environment, a statement must be included as to why
5. When and where services will be received
6. The duration that services will be provided and also the length of sessions
7. Whether services will be provided to the child individually or as part of a group
8. Who will be responsible for paying for services
9. The name of the service coordinator responsible for implementing and monitoring the IFSP
10. A plan for the transition of the child from early intervention to school-based services when the time arrives (Individuals with Disabilities Education Improvement Act, 2004)

A Brief History of Treatment

The contemporary research supporting the efficacy of intensive early intervention with children diagnosed with ASD has been substantial. Prior to these treatment inroads, children affected by autism and their families were often afforded marginal treatment that was frequently unsupported by scientific evidence. Historically, children with autism were thought to suffer from the condition as a direct result of their mothers being emotionally distant (Kanner, 1943), referred to as “refrigerator mothers” by the psychoanalyst Bettelheim (1967). These theories were based on conjecture rather than on any scientific evidence. They were psychodynamic in origin and held to the belief that the source of the child’s autism was due to the parents. It was generally recommended that children be placed in special schools. One such example was the Orthogenic School, a special school that was designed for emotionally troubled children (as children with autism were once classified). Unfortunately, such thinking only served to foster a myth that virtually destroyed people’s lives and led to valuable time lost that could have been used for meaningful treatment. Mothers bore the guilt of being falsely labeled as the cause of their children’s conditions and, sadly, reflected a view that was widely regarded at that time in history. Thankfully, the field has progressed to the point that we now understand just how important evidence-based practice (practice based on scientific evidence) is when designing effective treatment plans for persons with autism. Figure 1.4 provides an example of evidence-based treatment.

The window of opportunity that is provided during the early childhood years offers us an access point to initiate the design and implementation of effective educational programs and individualized treatment plans aimed at maximizing the potential of every child and, in turn, providing meaningful supports to the family. When we are positioned to capitalize on these opportunities, we can often realize significant treatment gains for young children as demonstrated in the research.

Applied Vignette 1.1 provides an example of the importance of early identification and evidence-based treatment for young children with autism.
Section I / Introduction

FIGURE 1.4 Evidence-based practices

<table>
<thead>
<tr>
<th>Non-Evidence-Based</th>
<th>Emerging</th>
<th>Evidence-Based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grounded primarily in speculation, superstition, myth, word of mouth, or cultural influences. These may not have been exposed to rigorous scientific examination or may have been proven to be ineffective or even harmful.</td>
<td>Some grounding in scientific research. These approaches have shown some evidence of their effectiveness in published scientific research, but they may need to be studied further or there may be some research findings that are contradictory.</td>
<td>Clearly grounded in scientific research. These approaches involve repeated demonstration of the influence of a treatment in multiple examples of research published in scientific journals.</td>
</tr>
<tr>
<td>Examples:</td>
<td>Examples:</td>
<td>Examples:</td>
</tr>
<tr>
<td>■ Dietary restrictions</td>
<td>■ Picture exchange communication</td>
<td>■ Discrete trial training</td>
</tr>
<tr>
<td>■ Facilitated communication</td>
<td>■ Social stories</td>
<td>■ Applied behavior analysis</td>
</tr>
<tr>
<td>■ Holding therapy</td>
<td>■ Structured teaching</td>
<td>■ Pivotal response training</td>
</tr>
</tbody>
</table>

APPLIED VIGNETTE 1.1
The Importance of Early Identification: Matthew’s Story

Matthew was just shy of his 3rd birthday when his parents learned that he was diagnosed with autism. Needless to say, the word *autism*, at the time in their lives, was completely foreign to them. They had heard mention of it, but this was the early 90s. His parents had never known of any child with this condition. They understood that Matthew would behave differently than children his age and he did not seem to process language the same way when he was spoken to, nor did he play the same way. Shortly after diagnosis, he began to receive intensive behavioral intervention at home and then began a preschool program at age 3. His program combined the elements of the TEACCH model, such as an individualized photo activity schedule, paired with structured work systems and a classroom designed especially for fostering visual clarity for Matthew and one other boy in his class also diagnosed with autism. Matthew also received some discrete trial training to foster the acquisition of some new skills largely aimed at reinforcing language and social interaction. The remaining children in the class were typical same-aged peers. It was a small group of only 10 children in a remote and rural area. His teacher and paraprofessional were exceptionally dedicated and were assisted by a technical assistance team trained in autism from the regional university. This relationship proved beneficial, in that Matthew’s educational team and family received professional development and support and Matthew’s educational plan was greatly shaped by the team and their expertise in autism.

As he progressed to kindergarten, Matthew had mastered the use of his activity schedule and work system and his language began to rapidly emerge. The teachers were systematic in their presentation of instruction and made sure to adhere to the instructional plan each day. Matthew’s social pragmatic skills began to develop as a result of his practice on these skills through
Designing Effective Longitudinal Educational Plans

When designing educational programs for a young child with autism and his/her family, it is important that professionals not only consider the immediate needs of the child and family, but also provide attention to the long-term scope of services and supports that will extend across critical transition points during the child’s life. This process should keep in mind the partnership and try to design services around the goals of the family. Such an approach not only asks questions relative to current needs and present levels of functioning, but also examines skills needed in subsequent educational environments such as preschool and kindergarten, for example.

Transition teams within schools should work closely to coordinate these educational and life passages for the children they serve and their families. It is important to recognize not only the academic and educational implications, but also the social/emotional aspects for families, as these transitions can create anxiety relative to ensuring that children receive continuity of services and supports.

By practicing longitudinal educational planning, we stay engaged with the questions of why, what, and how we are doing in terms of programming, with the expectation that we are building the skills needed for children to have success in future environments. Given that autism frequently implies a lifelong condition, it is important that we have a lifespan focus to support children and families across the span of services and supports that will be needed to afford them a meaningful quality of life. Longitudinal treatment plans serve as bridges to ensure that children and families receive the best possible education and related services and supports necessary to support them from birth through adulthood. These respective transitions are represented in Figure 1.5.
These transition points are consistent with those that children who are typically developing experience throughout their lives. The commonality of all parents and families is that they seek the very best in terms of quality-of-life experiences for their children. The difference for parents and families affected by autism is that these life transitions can pose even greater challenges with respect to ensuring meaningful and consistent educational services for their children. Granted, no one can predict the degree to which educational treatment programs can reliably address these for individual children and families, but programs that recognize the importance of these transitions and that provide mechanisms for ensuring that educational goals and treatment programs address the longitudinal needs of the learner can make a difference in the long-term outcomes for these individuals and their families.

The Importance of Evidence-Based Practices

What education or treatment options exist for children initially diagnosed with autism, and their families? There are numerous treatments that are available, some better than others, and often it is a difficult chore for families to discern which direction to go. First, do programs and services exist? What is available? Based on what is available, do programs subscribe to the use of evidence-based practices? These are just some of the questions that a family will need to confront.

What exactly is an evidence-based practice (EBP)? The term EBP originated in the field of medicine in the early 1970s (Odom, Brantlinger, Gersten, Horner, Thompson, & Harris, 2005), was conceptualized as a method to minimize the gap between research and practice for primary care physicians, and became an essential
component of medical education. This practice has extended into the field of education as part of the No Child Left Behind Act of 2001, and has subsequently become an integral part of evaluating the education and treatment of autism. This movement has continued to gain momentum in large part from the substantial increase in the prevalence of autism and to better inform practitioners as a means of promoting effective practice.

Along these lines, it is important for professionals to be discerning consumers of research and understand how research influences practice. We know, for example, that there are effective practices in the education and treatment of autism that do not have sufficient amounts of empirical or science-based support to qualify as evidence-based practices. We must use our professional judgment to assess the efficacy of these tools and their use in the education of children with autism. An important question to ask is: Why would a professional even consider using a treatment that was not evidence based?

The professional competence and judgment of teachers and related professionals is most important when implementing individualized educational plans for children with ASD, and must certainly be considered in the selection of interventions. Also important is input from parents and families as to what they think would be of value to their child, otherwise known as social validity. Social validity—what is of value to the learner, his/her family, and members of the classroom, school, and community—is important to consider when devising educational plans (Carter, 2010). Another final consideration is whether the interventions will promote meaningful outcomes for learners that will generalize across environments and maintain over time. These are all very important to planning and implementing successful interventions.

Common Approaches Used in Education and Treatment

There are numerous approaches in the education and treatment of children with autism. These treatment approaches could be classified into four categories, namely behavioral, naturalistic, developmental, and hybrid programs, or those that represent a blend between naturalistic and behavioral methods. Let’s examine each of these approaches as a means of providing an overview.

Applied Behavior Analysis

Applied behavior analysis (ABA) has the distinction of having the longest history and the most extensively documented evidence base to support its efficacy in the treatment of autism. ABA dates back to the 1960s and early 1970s, when behavioral approaches formed the basis for active treatment for individuals with autism and mental retardation who, at that time, were institutionalized in state residential facilities. The use of ABA in the education and treatment of these individuals resulted in the development of functional skills and demonstrated that the application of learning
principles could be applied to persons with the most severe disabilities. The work on operant conditioning pioneered by B. F. Skinner (1904–1991) was influential in the application of these intervention approaches. Prior to this discovery and use of behavioral treatment, persons who were institutionalized often received little in the way of meaningful education or “active” treatment, and were essentially warehoused (Blatt & Kaplan, 1974).

The use of ABA in the treatment of autism was advanced in more recent times by psychologist Ivar Lovaas (1927–2010), a prominent researcher in the field of autism who examined the use of ABA in the education and treatment of autism for over three decades. His research originated in the 1960s among children with mental retardation and those diagnosed as psychotic (a diagnosis often given to children who we now know to be on the autism spectrum) who were often dealing with serious and challenging behaviors such as self-injurious behavior. Lovaas began to disseminate findings from his work with 20 children with autism, using a behavioral treatment approach (Lovaas, Koegal, Simmons, & Long, 1973). Findings from this study demonstrated a reduction in challenging behaviors, including self-stimulation and echolalia (repetitious speech of sounds or words), whereas play and social behaviors increased. In addition, the results indicated that there was an increase in social interactions and language with maintenance of these skills over time among those children who resided with their parents and who had also received training in the behavioral methods as a means of promoting maintenance and generalization. In contrast, these meaningful outcomes were not the case for those children who participated in the study and remained in the institutional setting, as the maintenance of skills was unfortunately not durable and lasting for these children. This supports the importance of nurturance in the environment and consistency in the care of children as critical in their early development.

Further advances in ABA with young children with autism were realized with the use of these methods. Lovaas (1987), in a follow-up study of 19 children diagnosed with autism, demonstrated that behavioral treatment with an individual therapist for 40 hours per week was successful in teaching children diagnosed with autism; nearly half of the children who participated in the study achieved normal intellectual and educational performance. It is important to also note that these children although diagnosed with autism did not have mental retardation. This was one of the groundbreaking studies that demonstrated the efficacy of intensive behavioral therapy with young children diagnosed with autism.

The discrete trial training (DTT) method is a form of intensive behavioral treatment designed to facilitate the acquisition of skills among young children diagnosed with autism. This form of treatment was pioneered by Lovaas and is most often linked to him, with some referring to it as the “Lovaas Method.” This approach to treatment places emphasis on organizing the teaching and learning environment for the child and emphasizes structure in all phases of instruction. Discrete trial training (DTT) involves the presentation of simple tasks to the child with a distinct beginning and end, such as “Touch your nose,” “Look at me,” and “Point to cookie.” These are followed by verbal and tangible reinforcement that include statements like “Good saying apple” and the use of edibles as reinforcement for correct responses.
For example, the teacher might say to the child “Look at me” and, upon the child looking at the teacher, the teacher would respond, “Good looking at me” and then the teacher might also pair this verbal praise with an edible reinforcer. As progress ensues, these initial simple tasks are gradually replaced with more advanced skills as the child becomes comfortable with the teaching presentation and general format, and more primary reinforcers (edibles, for example) are replaced with newly learned or more naturally occurring reinforcers (verbal praise, for example). As their abilities increase, the concepts incorporate more of a focus on language and social behavior across academic and play settings. Essential to the use of this format is a logbook so that data can be recorded on the child’s performance at every session; this is termed continuous measurement and allows for tracking the performance of the learner on each trial (Lovaas, 2003).

Naturalistic Approaches

A contrasting form of treatment is the naturalistic approach. Naturalistic approaches for teaching children with autism have foundations in both the developmental and behavioral models, yet adhere to the philosophy that children should be taught within relevant contexts, such as their natural environments, to ensure fluency and maintenance and generalization of skills. The rationale for this is that it will provide greater and more relevant opportunities for learning with naturally occurring stimuli and reinforcers found within a child’s daily routine. This largely stems from the criticism by some that discrete trial training is too rigid and fosters robotic responding in children that does not sync with their natural environments. One example of a naturalistic approach used for teaching children with autism is pivotal response training (PRT) (Koegel, Koegel, Harrower, & Carter, 1999; Koegel & Koegel, 2006).

PRT is focused on helping teach children with autism in three areas: (1) motivation—the ability to engage in social-communicative interactions; (2) initiation—the ability to foster social initiations on the part of the child, especially in activities that promote joint attention; and (3) self-regulation of behavior. The development of these core areas is enabled through PRT interventions. The components of PRT interventions are linked to (a) family involvement in the design and delivery of interventions; (b) carrying out all treatment in the context of the child’s natural environments, such as home and school settings; and (c) treatment of pivotal behaviors that have a far-reaching impact on the child’s overall behavior (Koegel & Koegel, 2006). The PRT model relies on functional and naturally occurring reinforcers found within these natural settings, and also builds choice-making opportunities for the child (Koegel et al., 1999).

For example, after a child washes his hands, he receives his snack as part of the behavioral chain that links these two activities together. Naturally occurring reinforcement is tied directly to an activity as the consequence, thus reinforcing cause and effect for the child, which promotes learning. If this sequence is repeated daily, the child begins to anticipate it, and as it is reinforced daily, it provides the child with predictability and some sense of control within his/her environment.
Incidental teaching represents yet another popular method of naturalistic treatment for children with autism, and it was developed by Hart and Risely (1975) as a process for teaching language—more specifically, labeling and describing. *Incidental teaching* refers to the interactions that occur between a child and an adult in an unstructured setting. The teaching component occurs when the adult uses this naturally occurring framework to provide information to the child or give the child an opportunity to practice a developing skill. Incidental teaching uses some behavioral approaches, such as errorless learning (using prompts provided by the teacher to prevent students from making errors and thus learning incorrect patterns for performing a task) and reinforcement to assist in the development of skills. One very interesting component of incidental teaching is that it places emphasis on a child’s interests within the natural environment. This is reinforcing to the child and serves to promote engagement.

The general method for implementing incidental teaching (McGee, Almeida, Sulzer-Azaroff, & Feldman, 1992) with a learner is:

- **a.** The teacher waits for the child to self-initiate.
- **b.** The teacher asks the child to label or identify what he/she wants or what he/she needs (with a prompt if needed).
- **c.** The teacher responds to the child’s directive by either giving the object requested or facilitating the request.
- **d.** The teacher should always reinforce the child’s attempt by praising him/her for correct performance.

McGee et al. (1992) recommended that when considering incidental teaching as a method of instruction, you should also consider that it is a systematic approach to instruction designed for natural settings found within the child’s environment. The child’s environment should be arranged to draw the child’s attention to preferred toys and activities. Children initiate incidental teaching sessions by requesting an item or activity of choice, whereby the teacher prompts the child to provide an elaboration, and, upon producing the desired response, the child is given the desired item or activity and praised for providing the correct response.

Another form of treatment, the early start Denver model (ESDM), represents a comprehensive developmental and behavioral model for treating children with autism (Rogers, Munson, Smith, Winter, Greenson, Donaldson, & Varley, 2010). The ESDM is an interdisciplinary program that combines both developmental and behavioral approaches and thus could qualify in the eyes of many as a hybrid form of treatment. In fact, the ESDM combines both constructivist and transactional models of child development directed toward the active involvement of infants and toddlers in the formation of their behavioral development within their environments (Rogers & Dawson, 2010). Many of the teaching methods used in the ESDM are behaviorally based, thus the consideration for the label of hybrid to describe the methodology used in the ESDM.

The ESDM approach is aimed at developing a sense of empowerment through the active engagement of young children with their respective environments. In
order to accomplish this, the ESDM is comprised of an interdisciplinary team that is responsible for the design and delivery of interventions to children with autism. Team members come from related disciplines such as psychology, speech/language pathology, applied behavior analysis, and special education. The ESDM strives to embed teaching and learning within the natural ebb and flow of a child’s daily activities. In order to accomplish this, the ESDM utilizes a range of teaching methodologies from applied behavior analysis, pivotal response training, and the Denver model (the original model that was designed exclusively for preschoolers). These strategies include basic behavioral concepts such as the use of prompts and graduated guidance paired with naturally occurring reinforcement in the shaping of desired behaviors. Lastly, the original Denver model dictates the importance of the teacher or adult in the teacher/learner dyad. The importance of the teacher in modulating the affect and attention of the learner, paired with the use of language that is consistent with the child’s developmental level, is stressed. The adult also facilitates learner performance by arranging the environment to promote learner success through the facilitation of smooth and efficient transitions between activities (Rogers & Dawson, 2010).

Developmental Approaches

One of the more prominent developmentally based approaches that has been used in the treatment of autism has been a method often referred to as Floortime™. In actuality, the method’s complete reference is the developmental individual difference relationship-based model (or DIR/Floortime). Dr. Stanley Greenspan (1941–2010), a clinical professor of psychiatry and pediatrics at George Washington University School of Medicine, and his associate, Serena Weider, developed Floortime.

Floortime is rooted in the foundations of developmental psychology and is designed to assist children with autism in making developmental progress and attaining mastery of developmental milestones by attempting to minimize the sensory processing disorders they often experience. The model attempts to examine the developmental capacity of the individual child identified with ASD. This is accomplished through a thorough assessment of each child’s typical interactive patterns within natural environments and with family. Assessment consists of two or more clinical observations, each 45 minutes in length, of child–caregiver interactions or clinician and child interactions; the collection of a developmental history; review of the child’s current functioning levels; a review of family and caregivers; a review of current treatment programs; consultation with educators and related personnel on the child’s team; and, finally, a biomedical evaluation (Greenspan & Wieder, 1999). The aim of this assessment is to provide the therapist with a functional understanding of the child’s abilities and observed symptoms. Greenspan and Wieder (1999) acknowledged the sensory processing difficulties of children with ASD and how the relationship between social affect, motor planning, sequencing, and symbol formation are jointly affected. These deficit areas found among children with ASD impact their ability to problem solve, use meaningful language, and perform sequencing tasks. These findings are consistent with neuropsychological research findings that have indicated that executive
functioning in children with autism is impaired, thus explaining their difficulty with understanding greater degrees of abstraction, such as concept formation and complex language.

Greenspan and Wieder (1999) based Floortime on the premise of “understanding children and families by identifying, systematizing and integrating the essential functional developmental capacities” (p. 148). Floortime attempts to identify where children are in terms of their functional developmental capacities, such as in the areas of emotional development, sensory, modulation, processing, and motor planning, and in terms of social relationships and interactions.

Greenspan and Wieder (1999) reinforced that floor time was neither an assessment method nor a discrete form of treatment, but was instead a comprehensive approach for assisting the child in progressing through the six functional developmental capacities. These developmental capacities include abilities to: (1) attend to multisensory input and remain engaged and attentive; (2) demonstrate appropriate affect toward caregivers, for example, smiles and displays of affection; (3) initiate and respond to presymbolic communication, such as gestures and reciprocal smiles and sounds; (4) reciprocal social interaction and joint attention, such as recruiting a parent or sibling in an activity; (5) using ideas, such as imaginative play, or engaging in expressive language to meet needs; and (6) building bridges between ideas as a basis for logic, reality testing, thinking, and judgment, for example, using more elaborate forms of communicative expression, such as voicing opinions and exchanging viewpoints.

Floortime has three treatment components. The first of these treatment components is that parents engage with their children in activities aimed at formulating the emotional experiences needed for mastering the six developmental capacities previously described. The second treatment component involves the use of more complex activities that are implemented by interdisciplinary team members including speech language pathologists, physical and occupational therapists, and educators. Lastly, parents and family members work on their skills in relation to the six developmental milestones as a means of facilitating consistency within their respective families.

**Multicomponent Approaches**

One of the longest-standing models used in the education and treatment of children and adults with autism is the TEACCH method. TEACCH (Teaching, Expanding, Appreciating, Collaborating and Cooperating, Holistic) originated at the University of North Carolina–Chapel Hill under the direction of Dr. Eric Shopler (1927–2006). The TEACCH program is a comprehensive statewide network for the provision of services and supports to children and adults diagnosed with autism, and their families, and utilizes the branch campuses within the University of North Carolina system as regional centers.

The TEACCH program has historically been one of the most influential programs in the country for providing services to families and extensive professional
development for teachers and related service professionals. It is our opinion that the TEACCH program represents a multicomponent treatment approach in that, embedded within the tenants of the TEACCH model, one witnesses the use of behavioral, developmental, naturalistic, and ecological treatment practices at work in a most effective manner.

Some of the basic assumptions that distinguish TEACCH from other treatment approaches are that it acknowledges that autism is a lifelong developmental disorder that affects not only the individual, but also the family. Families are viewed as partners in the treatment process and TEACCH maintains a lifespan and longitudinal perspective in terms of treatment; thus, support for children throughout the schooling years also extends into the adult service realm working in partnership with school and community providers alongside families aiming for optimal quality-of-life outcomes for the individual. The core components of the TEACCH model are the focus on the individual and acknowledging the strengths of the child or adult, as opposed to working from a deficit model.

At the core of the TEACCH model is an approach called “structured teaching,” which takes into account the individual learner’s strengths and support needs and designs an individualized model of instruction aimed at developing independent skills. Structured teaching (Mesibov & Shea, 2010) is characterized by four distinct features: (1) structuring the physical and learning environment in a way that is understandable to the learner, (2) placing an emphasis on the learner’s strengths and abilities to process information visually, (3) incorporating the special interests of the learner to engage him/her, and (4) reinforcing attempts at meaningful communication.

Another distinct feature of the TEACCH model is that, unlike some other treatment models, it does recognize autism as a distinct culture of its own given the lifelong implications of the disorder. Mesibov and Shea (2010) have identified eight features of what they term the “culture of autism.” These include characteristics that are generally consistent in varying degrees across individuals diagnosed with autism. They include: (1) an ability to efficiently process visual stimuli and difficulty with language and auditory processing; (2) difficulty focusing attention in a consistent manner; (3) difficulties with expressive language and social communication; (4) problems with understanding and applying concepts of time and sequencing; (5) an insistence on routines and an inherent difficulty making transitions; (6) difficulty generalizing routines to new environments; (7) a narrow range of interests or activities; and (8) sensory difficulties.

The TEACCH model uses the concept of “structured teaching” to provide learners with physical structure, consistency, and embedded cues designed to capitalize on the individual’s strengths. This structure consists of physical arrangement of the child’s work area, organizing the sequence of the day, and the organization of the work tasks (Mesibov & Shea, 2010).

The model within a classroom begins by providing an organized and individualized work area for the child, placing the child’s desk to minimize distractions, and teaching the child how to use an individualized activity schedule (as used in Massey &
Wheeler, 2000), which could be comprised of either objects, pictures, symbols, or words, given the developmental level of the child. The activity schedule would have a sequenced list of activities to be done either as part of a half or whole day, with detachable cards (pictures, symbols, words) that the child would move from left to right, proceeding from top to bottom. In addition, accompanying work baskets are organized containing relevant work tasks and located near the child’s desk or designated work area. The schedule provides the child with visual clarity, the work structure provides the environmental or physical structure, and the clarity found within the schedule communicates to the child a sequence for his/her day of requisite activities, including breaks and leisure time. It is the view of TEACCH proponents that such structure minimizes the occurrence of challenging behavior and promotes meaningful engagement (Hume & Odom, 2007; Massey & Wheeler, 2000).

Mesibov and Shea (2010) recently completed an analysis of the TEACCH model in the wake of the evidence-based practice movement, with the purpose of providing some perspective on how the TEACCH model serves as an example of EBP given the application of these principles within extant research studies. The TEACCH model has a great deal to offer teachers, related professionals, and families with respect to the education and treatment of children and adults with autism. It is perhaps one of the most portable models of delivery, in that it adapts well to school or other related learning environments and is also adaptable to home and community settings. It also maintains a longitudinal perspective across the lifespan of the individual and prepares the learner and his/her family and team of professionals for transitions. This is done through the use of environmental supports in the form of structure, thus providing a mechanism for supporting the individual strengths of the child and serving as a form of antecedent management (Wheeler, Carter, Mayton, & Thomas, 2002), and serving as a practice that, once learned, can be adapted and generalized across the lifespan of the individual.

Consider This

In the preceding paragraph, a reference was made as to how the concept of structure is a major component of the TEACCH program that can be adapted and generalized across the lifespan of the child; for example, when first introducing a picture schedule with a 4-year-old with autism in his preschool classroom, the child began to become more engaged in meaningful activity. One reason was that the structure provided an order to his day, helped him in organizing his daily routine, and provided him with a sense of predictability. Adaptations were made to the use of his schedule as he progressed in age and grade level. Originally he had a large schedule posted at his desk with two columns—“to do” and “finished”—with pictures attached by Velcro. He then moved to a smaller version of this that had words paired with pictures. Then, as a secondary-level student, he had a pocket daily reminder calendar, just like many adults carry. Ultimately he had an iPhone, as he advanced from secondary education to postsecondary education at a local community college.
Sensory Integration Therapy

Another form of treatment that you will often see referred to in the treatment of autism is *sensory integration therapy*. This form of treatment has strong advocates, largely because children with autism may often exhibit atypical sensory responses such as exaggerated or hyper responses to auditory stimuli or little, or no response, termed *hypo response*. They also exhibit behaviors that are inconsistent with typical development, which may include, for example, repeatedly smelling particular objects that they frequently become fixated on. The literature suggests that the prevalence of sensory processing disorders in persons with autism is high (Dawson & Watling, 2000). Earlier studies suggest that the presence of sensory processing disorders often co-occur with the presence of stereotypical behavior in children with autism, thus fostering competing behaviors that interfere with learning.

Sensory integration therapy as a treatment option for children with autism has been somewhat controversial at times, and incomplete in terms of research evidence to support this treatment approach as evidence based. Auditory integration therapy has been most frequently cited as a method used to treat the auditory processing disorders associated with autism. The treatment concept asserts that electronically modulated or filtered music streamed in through headphones will be helpful in desensitizing a child with autism to auditory stimuli. A French otolaryngologist, Dr. Guy Berard, developed auditory integration therapy and it was most prevalent from the 1960s through the 1990s (Baranek, 2002).

Other forms of sensory integration therapy include, but are not limited to, visual stimulation and “brushing,” whereby a child’s arm is brushed as a means of desensitizing them to touch. Dawson and Watling (2000) conducted a review of clinical and applied studies designed to evaluate the efficacy of sensory integration interventions among individuals with autism. Their findings concluded, based on the studies reviewed, that sensory integration therapy intervention methods on the whole were *not* well validated given the limited number of controlled research studies conducted. There was no evidence to suggest which interventions were most appropriate by age(s) and levels of involvement. In a subsequent review conducted by Baranek (2002), similar findings were revealed and it was determined that the majority of studies reviewed failed to adequately demonstrate a relationship between the interventions employed and changes in behavior on the part of the participants. In conclusion, the importance of designing interventions aimed at minimizing the effects of sensory processing difficulties experienced by persons with autism is apparent, yet one should be mindful that the efficacy of these methods is still questionable given the lack of empirical studies to support their use among children and adults with ASD.

Complementary and Alternative Medicine Approaches

Complementary and alternative medicine (CAM) approaches to autism have been increasing in the past few years as the prevalence of autism has increased. Current estimates are that 52 to 95% of children diagnosed with autism are receiving CAM therapies (Golnik & Ireland, 2009).
CAM has been defined as a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine. Generally, CAM approaches are designed to complement conventional methods of treatment or to provide patients an alternative form of treatment (Wong & Smith, 2006). Wong and Smith (2006) reveal that they are on the increase, are often used by parents who are highly educated, and are often not reported to conventional medical providers for fear of disapproval. One of the earliest proponents of this practice was Dr. Bernard Rimland. Rimland was a man of science and also a father of a child with autism. He was the founder of the Autism Research Institute, which was a privately funded initiative comprised of scientists, physicians, and families whose goal was to study and disseminate treatment alternatives, including integrative medicine. Alternative medicine and other forms of alternative treatment approaches have been given a great deal of media attention, given the prevalence of autism and that media figures who are parents of children with autism have been outspoken proponents for looking at alternative health approaches as a means of preventing and even, in some cases, curing autism.

Kidd (2002), in a review of medical management of autism, highlighted the frequent course of treatments when one adopts an integrative medicine approach. This approach typically involves a dietary overhaul as the first course of action. The rationale for this action is that children with autism often have reported food sensitivities and allergies. This phase systematically eliminates food additives, food colorings, artificial sweeteners, and preservatives from the child’s daily intake. Casein is found in milk and dairy products, and gluten is found in breads and cereals. The use of vitamin and mineral supplements is also a component of this treatment approach. The second phase of this treatment model is a medical workup, including an analysis of blood chemistry, amino acid screening, and organic acid screening. The goal, of course, is to identify all potential correlates suspected of contributing to the child’s condition and then, based on these findings, constructing an integrated treatment plan comprised of conventional medicine and alternative medicine.

Of course these approaches are not met without controversy in the conventional medical community as being void of scientific evidence to support their efficacy. Nonetheless, the general public has enthusiastically embraced access to these and other materials aimed at disseminating a heightened public awareness regarding autism. Alternative medicine has become much more popular in our society, and people are generally more informed about such matters. Therefore, interest on the part of parents is certainly understandable, as they seek to improve the quality of life for their child though the current scientific evidence to substantiate this form of treatment does not clearly support many of these methods.

In summarizing the use of CAM therapies or treatment approaches, one can understand the desire of parents to seek out all possibilities that may offer hope for their child. The caveat is, often these approaches have yet to be validated and could in some cases be ill advised for the health and well-being of the child or his/her condition. It is important as professionals to understand the response of families but also to be prudent in recommending treatments that have yet to demonstrate efficacy.
Frankly, the lack of studies examining the applied use of these therapies under controlled conditions and even in documented case studies is currently limited. More research is needed to explore the potential contribution of these approaches in the treatment of ASD. Kidd (2002) has recommended that research address: the relationship between genetic predispositions and the role of toxins as causal factors; maternal toxins as a prenatal consideration and risk factor; the relationship between the central nervous system (CNS) and immune abnormalities; and the role of autoimmune mechanisms to the overall condition.

Service Delivery Models

Home-Based Intervention

As previously mentioned, home-based early intervention programs for young children diagnosed with autism have become increasingly prevalent. This movement was largely influenced, at least initially, by the work of Lovaas (1981). His book was entitled *Teaching Developmentally Disabled Children: The ME Book* (referred to as *The ME Book*). This text outlined all components of the Lovaas method for teaching children with autism and other developmental disabilities. His work in a later study (Lovaas, 1987), which served as the stimulus for advocating the use of intense behavioral treatments conducted within the home with trained behavior analysts and parents as colleagues, promoted the results of this approach. Lovaas (1987) demonstrated that early intensive behavioral intervention (EIBI) was effective as a method for enhancing learning and long-term development in young children with autism. He examined the use of intensive behavioral intervention on the cognitive development of children diagnosed with autism and mental retardation who were receiving behavioral treatment for 40 hours per week across two years. The results revealed that 47% of participants in the experimental group achieved normal intellectual and educational functioning, with normal-range IQ scores and successful performance in first-grade classrooms within the public schools. This methodology has been extrapolated, but not completely replicated, across various settings. Luiselli, Cannon, Ellis, & Sisson (2000) concluded, from their study using intense behavioral treatments with young children diagnosed with autism, that implementing these methods with children before the age of 3 had greater likelihood of long-term gains on development and IQ than perhaps with children beyond age 3. Eikeseth, Smith, Jahr, & Eldevik (2002) replicated the treatment approach advocated by Lovaas but did so in a school setting and found favorable gains. Sallows and Graupner (2005) utilized the behavioral treatment approach with young children within a clinic setting with consistent findings in terms of increased IQ and developmental gains. These are only a few studies that have replicated or expanded on the initial research of Lovaas using the intense behavioral treatment method, but all have pointed to having merit if used early enough in the child’s life immediately following the diagnosis. The components of the early intensive behavioral treatment approach are identified in Figure 1.6.
Home-based treatment programs were criticized at first by many because they competed with school-based programs and potentially posed threats to existing school programs in terms of availability and potential costs imposed on school systems in that parents of young children with autism were hopeful given the results of intensive early behavioral treatment. Subsequently, many parents sought these services within schools and early on these programs were in direct contrast to some school-based programs by virtue of their treatment intensity, that is, 40 hours per week of one-on-one intervention and the fact that they were home-based. Many school districts faced litigation on this issue as services for children with autism were developed and expanded within schools during the mid to late 1990s. Thankfully, early intervention program offerings have expanded, but still many parents are burdened with the lack of services or how to pay for services such as intensive early intervention within the home as these services can be very expensive. Until recently, many states did not have allowable coverage for these services through health insurance and the burden fell upon families. Medicaid waivers are available in a number of states through the Social Security Act. This means that states can choose to waive income when determining Medicaid eligibility. Thirty-seven states have passed insurance reform measures improving coverage for services to children with autism. Such coverage requires that health insurers cover behavior analysis for children with autism; the amount of coverage varies by state. This could certainly serve as a needed support for families struggling to meet the costs of providing their child with intensive early intervention services. Given the data that has been reported, it would seem a worthwhile investment for states because service delivery systems are going to increasingly

**FIGURE 1.6 Components of the Early Intensive Behavioral Intervention**

- Treatment is conducted within the home setting for young children with autism who are generally between the ages of 2 to 4 years.
- It is recommended that these programs adhere to a consistent treatment protocol.
- This protocol generally involves 30 to 40 hours per week in the child's home with a behavior analyst and parents to assist with implementation.
- The treatment plan usually involves getting the child ready to learn through learning to sit, attending to directions, and minimizing competing behaviors.
- Skills in the areas of imitation, matching, and early language, and basic self-help skills such as eating, toileting, dressing, and brushing teeth, are first identified.
- Language goals are expanded to include intermediate and advanced skills as the program progresses.
- Discrete trial training consists of teaching repeated trials to a child and reinforcing his/her performance until skills are mastered.

*Source: Persico et al. (2012).*
feel the pinch to provide appropriate services given the ever-increasing numbers of children being identified with autism.

Given the success of EIBI for young children with autism, many ask about the success of these children as they enter schooling. There have been references made to children being “recovered” from autism as a result of receiving early intensive behavioral treatment. There have been a few case studies reported in the literature, but no large-scale controlled studies. Butter, Mulick, and Metz (2006) provided a case study of eight students who, after receiving EIBI, no longer met the criteria for mental retardation or pervasive developmental disorder (PDD). They found meaningful gains in IQ standard scores, adaptive behavior standard scores, and nonverbal IQ standard scores, and academic achievement scores were in the average range. However, seven of the eight children continued to have language impairments. More research is needed under controlled conditions to fully surmise the long-term implications of EIBI on the development of children diagnosed with autism. To date, these types of investigations have not been extensive within the literature.

**School-Based Models**

The importance of facilitating successful transitions for all children upon entry into formal schooling is fundamental to promoting a point of connection needed for long-term success. For children with autism, this is even a greater concern given the learning and behavioral challenges experienced by many of these children. School programs for children with autism appear to have a great deal of variance. This could be in part due to the belief that no one single form of treatment is considered the best for the treatment of autism (Simpson, 2005). Because autism represents a spectrum with degrees of variance involved, the range of differences within the population makes the identification of a single treatment nearly impossible; thus, treatment packages that combine multiple methods of support are frequently the norm. Keeping with this theme, more often than not, school-based models for serving children with autism take on various forms and are frequently comprised of integrative approaches.

Another aspect that contributes to the degree of variance in the education and treatment received by children with ASD is the lack of standardization and availability of personnel preparation programs designed to prepare teachers and related service professionals. How well professionals have been trained to meet the educational, behavioral, and other related support needs of children with autism and families has an impact on the type and quality of treatments that children with autism receive.

Typically, schools provide children with a cadre of intervention methods including developmental, some behavioral, and TEACCH methods. School programs must be in compliance with the Individuals with Education Act. Perhaps the greatest challenge in terms of providing school-based services is the degree to which these practices reflect best and effective practices (at a minimum), if not evidence-based practices. The second challenge is delivery of these practices with fidelity, a term that refers to whether interventions are consistently implemented by all teachers and caregivers as
they were designed. Many states have program quality indicators that are applied to their respective programs and services to children with autism.

Central components of school-based practices should be the use of data to inform decision making as per the child's daily progress on IEP goals and objectives, the use of longitudinal curriculum planning, and partnering with families, which should be at the core of the philosophy that undergirds school-based practices. The use of behavioral and other forms of treatment, such as TEACCH methods, should be reflective of the individual child's strengths and needs as reflected on the IEP. Any quality program should have extensive language-/communication-based therapy coordinated within the context of the child's educational program. The use of positive behavior supports as a method for promoting and teaching positive behaviors is not only mandated by the IDEA, but is also considered best and effective practice.

Simpson (2005) provided an evaluation of treatment options used in the education and treatment of children with autism; many of these are found within school-based programs. He organized these treatments into the following categories: (a) scientifically-based, which was comprised of applied behavior analysis, discrete trial teaching, and pivotal response training; (b) promising practices, which consisted of picture exchange communication systems (PECS), incidental teaching, structured teaching as part of the TEACCH model, augmentative and alternative forms of communication, and assistive technology; (c) limited supporting information for practice, which was comprised of Floortime, gentle teaching, pet therapy, and fast forward; and finally, (d) practices not recommended, which included holding therapy and facilitated communication. In subsequent work conducted by three university-based programs, the National Professional Development Center on Autism was created. The initiative was led by the University of North Carolina's Frank Porter Graham Center, The University of California at Davis's MIND Institute, and the Waisman Center at the University of Wisconsin. This initiative was designed to promote the use of evidence-based practices for teaching children with ASD. Though evidence-based practices used in the education and treatment of children identified with ASD have been identified from research, many questions still remain as to the capacity and infrastructure within schools needed to implement these practices.

We have addressed interventions used within school programs, so now let's examine where instruction occurs for children with ASD. Children are assessed and treatment is based on the individual needs of the child; the least restrictive placement option is identified as mandated by the IDEA concerning the continuum of placements for children with special needs. This means that instruction and educational services can be received in a variety of settings, including inclusion classrooms, where children with ASD are educated with their non-ASD peers; partial pull-out programs, where they attend some classes with their non-ASD peers; self-contained classrooms designed for children with autism; and specialized schools, where deemed necessary for children with greater levels of involvement. This placement continuum is consistent throughout primary, middle, and secondary educational settings for children with
ASD. As children enter high school, some children with ASD may receive training in the community on job skills or other functional skills, such as orientation and mobility in the community, leisure skills, and shopping skills, among others, as deemed appropriate for the individual child and as reflected on his/her IEP.

**Post-School and Community Options for Adults with ASD**

*Post-school options* refer to post K–12 schooling. For young adults with ASD, there are a variety of options depending on their levels of ability or challenges. For young adults with ASD who are high functioning, options can include higher education within colleges and universities or employment in the community. For others who are more involved with more severe levels of disabilities, this could mean placement within adult service settings such as community-based workshops or day programs. As parents age, their concern for the long-term well-being of their children often becomes most apparent, and for parents of adult children with ASD, it is important to know there are safety nets of familial and related services and supports available to their children beyond their lives. Refer to Applied Vignette 1.2 as an example.

Successful post-school transition and community living are essential outcome measures for young adults with ASD. Education, employment, and the development of essential life skills, including the pursuit of leisure activities, all serve to comprise a meaningful quality of life for many. The attainment of these is contingent upon successful transition planning that is fostered through an enriched collaboration between the student, his/her family, education professionals, community service providers, and potential employers who are dedicated and engaged in providing young adults with ASD with real opportunities for successful adult lives.

**Applied Vignette 1.2**

**Family/Professional Partnerships**

Dale was a 21-year-old young man with high-functioning autism. As he ages out of his school-based program, his local education agency (LEA) has worked in collaboration with the local adult service provider for persons with developmental disabilities to ensure a smooth transition if services are needed. Dale was employed 20 hours per week as a bagger and stock clerk at the local grocery store in his small town. He lived with his parents and older sister in a very close-knit and supportive family. His parents had planned to add an additional two rooms onto their existing house to accommodate more independence for Dale given his age, and they had made provisions in their will that Dale’s sister, Sarah, would become his guardian upon their passing. The community school system was also very supportive and monitored Dale for a year after his departure from school to ensure his success in his job setting.
Exemplary Programs and Practices

This chapter’s segment on exemplary programs and practices highlights the work of the Princeton Child Development Institute (PCDI), a nonprofit program that provides an array of services to persons with autism across the lifespan. PCDI was founded in 1970 and provides evidence-based practices in the education and treatment of autism from early intervention through adulthood. For more information consult their website at: www.pcdi.org/home.html.

Chapter Summary

The purpose of this chapter was to serve as the beginning of your study in the area of autism spectrum disorders (ASD). Key topics and terms were introduced, as was the field of autism from a historical perspective. In addition, we discussed the rise in prevalence of autism rates, which has made autism a global concern. The importance of early detection and early intervention was presented, and the concept of longitudinal curriculum planning as a fundamental element of designing educational and long-term treatment plans for children with ASD was discussed. We stressed the importance of building successful transitions across educational settings across the lifespan of the child in order to sustain and maximize treatment gains, foster greater levels of development, and also as a means of maintaining momentum for the child and his/her family.

The chapter also discussed the importance of evidence-based practices in the treatment of ASD. As scientific evidence emerges regarding the efficacy of treatment, practitioners must use the methods that have been demonstrated to be most effective under controlled study. The point was made that some treatments have yet to mount the degrees of scientific evidence to qualify them as evidence-based practice (EBP), and debate remains as to the operational definition of what precisely constitutes EBP. The important point here is that some treatments, although not yet considered EBP, show promise in the demonstration of their day-to-day effectiveness.

Various models of treatment were discussed, including applied behavior analysis and naturalistic, developmental, multicomponent, and sensory integration models. The components and basic tenants of each of these were presented. In addition, complementary and alternative medical practices were discussed as forms of treatment for children with ASD.

The final section of the chapter examined home-based treatment, including early intensive behavioral intervention (EIBI) therapy, school-based programs for school-aged children with ASD, and post-school and community options for young adults with ASD.

In summary, this chapter was designed to provide you with an introduction to the field of autism and many of the important facets related to providing a meaningful education to children with ASD and their families.
ACTIVITIES TO EXTEND YOUR LEARNING

1. Select one form of treatment described in this chapter and conduct a brief literature search on it in the library, selecting five to seven research articles that examine the use of this form of treatment with children with ASD.

2. Conduct an observation at two or more school-based programs serving children with autism and identify the classroom characteristics, educational practices, and treatment forms. Assess the consistency of these across two or more environments and note the degree to which you recognize the use of evidence-based practices within these settings.

3. Meet and interact with families of children with autism through a community fundraising activity during National Autism Awareness month, held each April. Be a participant in the annual walk or volunteer to help plan and participate in this important awareness event.

4. Select one aspect of one of the topics presented in this chapter and allow for an in-depth examination of this topic to increase your knowledge base.

5. Talk with as many interdisciplinary professionals working in the field of autism that you possibly can to gain a more enlightened understanding of their respective roles as professionals dedicated to helping children and families affected by autism. These professionals could be special education teachers, behavior analysts, speech language pathologists, and/or other related professionals such as occupational therapists or physical therapists.

RESOURCES TO CONSULT

Some valuable resources to consult for further information on the material covered in this chapter include the following:

Websites

Age of Autism
www.ageofautism.com

Autism Research Institute
www.autism.com

Autism Society of America
www.autism-society.org

AutismToday.com
www.autismtoday.com

Healing Thresholds Autism Therapy Homepage
http://autism.healingthresholds.com

National Autism Association
www.nationalautismassociation.org

National Professional Development Center on Autism Spectrum Disorders
http://autismpdc.fpg.unc.edu

Books


