Advances in the Diagnosis and Treatment of Autism Spectrum Disorders

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A dramatic increase in the number of children who are diagnosed with an autistic disorder has given rise to a deluge of articles on autism in the professional as well as the popular literature. This review of the current literature summarizes and synthesizes recent information on the causes and manifestations of autism; the trends in screening, diagnosis, and assessment; and the salient features of different treatment programs. It provides an overview of the advances and controversial issues that are of special interest to practicing clinical psychologists.

Autism is a perplexing disorder, and despite the massive amounts of literature available, definitive answers are hard to come by. Fortunately, researchers are making progress in the quest to identify the different etiologies of autism and are able to predict the course of several autistic subtypes. Longitudinal studies have helped to refine diagnostic processes and to determine the relative effectiveness of different treatment protocols. The goal of this article is to provide a broad view of new advances in the diagnosis and treatment of autism and related disorders.

Defining Characteristics of Autism and Other Related Disorders

Although most authorities today agree that autism is caused by a dysfunction in the central nervous system, there are conflicting views as to its defining characteristics and to the causal chain that links brain dysfunction to behavioral characteristics (Kusch & Petermann, 1995). Authorities do agree autism can be defined at three different interdependent levels: as a neurological disorder related to brain development; as a psychological disorder of cognitive, emotional, and behavioral development; or as a relationship disorder in which there is a failure of normal socialization (Kusch & Petermann, 1995). Authorities also agree that autism is a spectrum disorder, although the spectrum cannot be defined simply from mild to severe. Different children manifest different combinations of symptoms, but all share a core deficit in forming relationships and communicating (Kusch & Petermann, 1995; Pratt, Vicker, & Davis, 2001).

Diagnostic Frameworks

The most frequently cited definition of autism is provided in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM–IV; American Psychiatric Association, 1994). According to the DSM–IV classification system, autistic disorder is one of several pervasive developmental disorders (PDDs) that are caused by a dysfunction of the central nervous system leading to disordered development. All children with PDD are characterized by qualitative impairments in social interaction, imaginative activity, and both verbal and nonverbal communication skills. Additionally, they have a limited number of interests and activities, which tend to be repetitive, and the manifestation of symptoms occurs within the first 3 years of life. The other four pervasive developmental disorders are Rett’s disorder, childhood disintegrative disorder, Asperger’s disorder, and pervasive developmental disorder—not otherwise specified (PDD–NOS). Rett’s disorder and childhood disintegrative disorder have distinct symptomatology (see DSM–IV for a complete description) and are rarely confused with other disorders.

Asperger’s, PDD–NOS, and autistic disorder are subject to definitional and diagnostic confusion. Autism is considered, in some of the literature, as a spectrum disorder that encompasses Asperger’s and PDD–NOS (Prior et al., 1998). Likewise, there is disagreement as to whether the term PDD–NOS describes children who fall within the autistic spectrum but do not meet the full criteria for autistic disorder. In practice, PDD and PDD–NOS, as well as PDD–NOS and Asperger’s, are often used interchangeably, adding to confusion regarding the implications of a PDD–NOS classification (Kusch & Petermann, 1995; Tsai, 1998; Volkmar, 1997).

Classification Systems: New Alternatives

The Diagnostic Classification of Mental Health and Developmental Disorders in Infancy and Early Childhood is a newer system currently under development (Zero to Three, 1994). It is not designed to replace the DSM–IV but to complement it by...
describing a number of mental health disorders that can be identified at an early age. The system is described by its authors as an “evolving framework” (Zero to Three, 1994). In addition to the DSM-IV category of PDD, these authors propose a category termed multisystem developmental disorder (MSDD) with four characteristics:

Significant impairment in, but not complete lack of the ability to engage in an emotional and social relationship with a primary caregiver; significant impairment in forming, maintaining, and/or developing communication; significant dysfunction in auditory processing; and significant dysfunction in the processing of other sensations including hyper- and hypo-reactivity, and motor planning. (Zero to Three, 1994, p. 44)

Although the classification of this new system, referred to as DC-0–3, is descriptive rather than explanatory, there is a strong presumption that constitutional factors are associated with MSDD. The fact that children who have been in Soviet-block orphanages may manifest symptomatology as described in MSDD suggests that in some, but not all, instances the etiology of MSDD may be associated with extensive stimulatory deprivation. This deprivation may have affected neurological development at the structural level in children with no known prenatal or genetic factors.

New Estimates of Prevalence

The reported prevalence of autism has increased dramatically over the past 20 to 30 years. In the 1970s the reported prevalence was considered to be about 1 in 2,500. A more recent local study carried out in Brick Township, New Jersey, found that the prevalence of autism may be as high as 1 in 250 (Centers for Disease Control and Prevention [CDC], 2000), most current literature describes the prevalence of autism as 1 in 500 (Fombonne et al., 2001), and local area rates can vary markedly without providing substantiation for a higher broad area rate (CDC, 2000). Pervasive developmental disorders are more common in childhood than cancer, Down’s syndrome, or cystic fibrosis (Bristol et al., 1996). Explanations of this dramatic increase include heightened awareness on the part of professionals and laypersons, increased diagnostic work-ups, and the existence of yet unknown precipitating factors within the environment (Bristol et al., 1996).

Breakthroughs in Understanding of Causal Factors

There is general agreement in the literature that pervasive developmental disorders are related to abnormalities of brain structure or function and that the most likely basis of these abnormalities is genetic susceptibility. There is also general consensus in the literature that there are unidentified factors within the prenatal and postnatal environment that may trigger the onset of symptoms. Technological advances enable researchers to compare the brain functions of typically developing children and children with autism. Iverson (2001) reported on a study using positron-emission tomography scanning techniques that found an abnormal capacity for serotonin synthesis in the brains of children with autism. Although follow-up studies have corroborated this finding, targeted pharmacological interventions have had mixed results. Recent studies implicate the cholinergic and GABAergic systems, but these studies had small samples and need to be replicated with more subjects (Medical Research Council, 2001).

Several other investigators have compared brain structures of children with and without autism and identified some significant differences including abnormalities in the limbic system (Neu-wirth, 1997). Courchesne et al. (2001) reported normal brain volume at birth but increased cerebral and cerebellar white matter and cerebral cortical gray matter by ages 2 and 3 in his sample of children with autism, with a return to more typical volumes in older children with autism. The cerebellum in children with autism had less gray matter, a lower ratio of gray to white matter, and smaller Vermis Lobules VI–VII compared with typical controls.

A line of genetic research is being carried out by the Collaborative Programs of Excellence in Autism. Chromosome areas where defective genes related to autism are being studied by linkage analysis implicate Chromosomes 7 and 15. Forty percent of people with autism in a study by Ingram (as reported by the National Institute of Child Health and Human Development, 2001) exhibited a change in one of the two copies of the HOXA1 gene, which is located on Chromosome 7. Only 22% of people in the study without autism and without a family member with autism showed the same change. Thirty-three percent of family members of individuals with autism who did not have autism themselves had the change in this gene. HOXA1 may, in fact, not be a causal gene for autism but may be an autism susceptibility gene. It may make an individual more vulnerable to developing the disorder.

Explanations of the behavioral symptomatology in relationship to the neurobiology of the autistic disorders are still unclear. Researchers continue to seek ways to link dysfunctions of the nervous system with the observed behaviors. They are investigating the coherence between deficits in three aspects of social behavior: sharing intentions, joint attention, and affective sharing, as well as the preference for sameness and routine seen in individuals with autism (Kusch & Petermann, 1995).

Incidence of Accompanying Disorders

Accompanying disorders are conditions that are frequently associated with autism but are not specific to the diagnosis of autism. The presence or absence of an accompanying disorder has a significant effect on an individual child’s prognosis. Of people with diagnosed autism, 75% to 80% are also diagnosed with mental retardation (National Institutes of Mental Health [NIMH], 1997), 15% to 20% are considered severely retarded with IQs below 35, and more than 10% have an average to above-average IQ (NIMH, 1997). Approximately one third of children with autism develop seizures, starting either in early childhood or adolescence (NIMH, 1997).

Fragile X syndrome is an inherited disorder that has been found in approximately 10% of the population with autism and is much more common in males. It is named for a defective piece of the X chromosome. People with fragile X are likely to have mental retardation and have some unusual physical features that are not typical of autism. Clinical studies as reported by Filipek et al. (2000) found a range of 3% to 25% of patients with fragile X with autism. Earlier studies reported a higher relationship between fragile X and autism, but no evidence of fragile X in people with autism was found using cytogenetic techniques. When using molecular genetic analyses, a small number of individuals with autism
exhibited fragile X. Tuberous sclerosis is a genetic condition that causes abnormal tissue growth in the brain and problems in other organs. This condition is quite rare, occurring less than once in 10,000 births, but about one fourth of those affected are also identified as having autism (NIMH, 1997).

An increased incidence of affective disorders in the families of individuals with autism spectrum disorder has been reported by DeLong (1994). Bipolar disorder or major depression was found in about one third of the families of individuals with autism. He also reported on a group of children with autistic spectrum disorder that were responsive to lithium treatment after showing typical symptoms of bipolar disorder.

The American Academy of Child and Adolescent Psychiatry (1999) adopted practice parameters for the assessment and treatment of children, adolescents, and adults with autism. They reported on a possible association between autism and obsessive-compulsive disorder (OCD) due to the similarity of the restricted behavioral repertoire and perseveration typical of this disorder, and the narrowed interests with individuals with autism. The relationship between the two disorders is not clear, even though these individuals may respond to some of the same pharmacological agents.

Increased Awareness of Early Signs and Symptoms

Although most clinicians are reluctant to diagnose autism at an early age, much of the recent research focuses on manifest behaviors or behavioral deficits seen in very young children that may be the precursors of autism. Young children at risk for autism have difficulties orienting to social stimuli, an impoverished social gaze, and impairments in the areas of shared attention and motor imitation. Without these basic abilities, children cannot share understanding, communicate with others, or engage in interactive play.

Two lines of research are looking at how early autism can be identified through behavioral symptoms. London (2001) reported that the National Alliance of Autism Research has funded the “Baby Sibs” project led by Dr. Rebecca Landa. Siblings are at risk for autism at a rate almost 50 fold of other children, or approximately 10% to 20%. In a prospective study, she will assess the infant siblings of children with autism beginning at 14 months of age to determine whether symptoms of autism can be reliably determined at that age. Retrospective studies reviewing first birthday videotapes of children with autism have correctly identified 10 of 11 children with autism and 10 of 11 typically developing children but have not been independently replicated. Symptoms seen in the children with autism included deficits in pointing, showing objects, looking at others, and orienting to name (Osterling & Dawson, 1994).

The New York State Department of Health Early Intervention Program (1999) provided clinical clues of diagnostic importance for children under 3 years of age described in the literature. They include the following:

- failure to engage in a back and forth conversation; inability to interpret emotional cues; delay or absence of spoken language; looks through people, not aware of others; not responsive to other people’s facial expressions, feelings; lack of pretend play, little or no imagination; does not show typical interest in, or play near, peers purposefully; lack of turn taking; unable to share pleasure; qualitative impairment in non-verbal communication; not pointing at an object to direct another person to look at it; lack of gaze monitoring; lack of initiation of activity or social play; unusual or repetitive hand and finger mannerisms; unusual reaction, or lack of reactions to sensory stimuli.

(p. 57)

Sleep and eating disorders are also common in young children with autism (Anderson, 1998; Dahlgren & Gillberg, 1989).

Although neither researchers nor practitioners claim that the identification of one indicator, or even a cluster of indicators, warrants a diagnosis of autism in children under 2, the presence of these indicators provides the basis for early intervention. Unfortunately, when faced with parental concerns, pediatricians and psychologists often overlook early, subtle signs. Most children with autism are not diagnosed until close to their third birthday, when language difficulties and behavioral differences become more apparent. Although early signs and symptoms may remit in many cases, a wiser and more cautious course of action is to refer the family to a professional with expertise in autism and other developmental disorders.

Advances in Screening, Diagnosis, and Assessment Screening

Checklist for Autism in Infants and Toddlers (CHAT). The CHAT (Baron-Cohen, Allen, & Gillberg, 1992) is the most well known screening test for identifying possible autism spectrum disorder in very young children. In common practice, the CHAT is administered when children have been identified as at risk in a developmental screening or where there is parental concern or clinical cues. If the CHAT results suggest autism, an in-depth assessment is the recommended course. If CHAT results do not suggest autism, further developmental or health evaluations are recommended to address the original concern. As a screening instrument, the CHAT may incorrectly identify autism in children with severe developmental delays who otherwise are not autistic, and may miss some children whose early symptoms are mild and nonspecific and whose symptoms have not yet emerged. (New York State Department of Health Early Intervention Program, 1999). In spite of these limitations, at the present time, the CHAT is generally considered to be the best available screening tool.

The Pervasive Developmental Disorder Screening Test II (PDDST-II). The PDDST-II (Siegel, 1999) is a newly developed screening test designed for administration in different settings where there are concerns about possible autism spectrum disorders. Different forms of the PDDST-II are designed for representative populations in (a) primary care clinics, (b) developmental care clinics, and (c) autism clinics. The PDDST-II is an unpublished parental report measure. According to Siegel (1999), sensitivity and specificity are adequate, with the exception of low specificity for the developmental care setting.

The Screening Tool for Autism in Two-Year-Olds (STAT). Currently in development, the STAT (Stone & Ousley, 1997) is an empirically derived measure designed for use by professionals involved in early identification and intervention. It is a relatively brief interactive measure that can be used to identify children in need of more extensive follow-up. The STAT differs from the CHAT in that it was developed as a second-stage screening instrument to differentiate children with autism from children with other developmental disorders (Stone, Coonrod, & Ousley, 2000).
**Assessing Children With Possible Autism**

Assessment of autism is a complex and ongoing process that may take several hours to complete. After sensory and medical concerns are ruled out, the diagnosis of autism can be made by a sole practitioner in psychology. However, it is often useful to complete a “multidisciplinary evaluation of social behavior, language, and nonverbal communication, adaptive behavior, motor skills, atypical behaviors, and cognitive status by a team of professionals experienced with autism spectrum disorders” (National Research Council, 2001, p. 214) when this is feasible. A thorough developmental history should be taken using the family and any service providers. The family should be encouraged to communicate their priorities for their child and be included as an integral part of the child’s team.

The American Academy of Neurology/Child Neurology Society’s Practice Parameter (Filipek et al., 2000) presents an algorithm for the diagnosis of autism that may be useful to practitioners. The first level is routine developmental screening, generally completed by pediatricians at well check-ups. If a child fails this level of surveillance, then audiological assessment should be completed and autism screening should be performed using an instrument such as the CHAT. If the child fails the autism screening instrument, a formal diagnostic evaluation should be completed.

**Autism Assessment Instruments**

Although several instruments have been designed to assess autism in young children, experts recommend that no single autism assessment instrument be used as the sole basis for diagnosing autism. Practitioners who have not seen a large number of young children with autism may over- or underdiagnose this disorder because of the varying diagnostic picture these children may present.

**Autism Behavior Checklist (ABC).** The ABC (Krug, Arick, & Almond, 1979) is one of the oldest of the autism checklists. The demonstrated specificity and sensitivity of this instrument is relatively low, and it is considered of limited usefulness (New York State Department of Health Early Intervention Program, 1999).

**Autism Diagnostic Interview—Revised (ADI-R).** The ADI–R (Lord, Rutter, & LeCouteur, 1994) is tied to current diagnostic criteria and has demonstrated good sensitivity and specificity in validity testing in independent samples. It does require extensive time and training to administer and may be most useful as part of a more in-depth assessment in children for whom screening tests suggest a fairly high level of concern for autism (New York State Department of Health Early Intervention Program, 1999).

**Childhood Autism Rating Scale (CARS).** The CARS (Schopler, Reichler, DeVellis, & Daly, 1980) is the most widely used standardized instrument designed to aid diagnosis of autism in young children. Because it is relatively easy to administer, it can be used to assess children with possible autism in a variety of settings, such as early intervention programs and developmental diagnostic centers. The instrument is supported by research and includes a severity rating. The CARS severity rating is used to periodically monitor children with autism and for assessing long-term outcomes (New York State Department of Health Early Intervention Program, 1999).

**The Gilliam Autistic Rating Scale (GARS).** The GARS (Gilliam, 1995) is designed to identify and diagnose autism in individuals 3–22 years of age and to estimate the severity of the problem. It is designed for use by teachers, parents, and professionals. The GARS has strong psychometric characteristics confirmed through studies of test reliability and validity.

**The Gilliam Asperger’s Disorder Scale (GADS).** The GADS (Gilliam, 2001) is designed to evaluate children with unique behavioral problems who may have Asperger’s disorder. Both validity and reliability have been supported.

**The Autism Diagnostic Observation Schedule (ADOS).** The ADOS (Lord et al., 1994) is a semistructured assessment of play, interaction, and social communication. Although it can be used as part of a multidisciplinary intake assessment, it is standardized on the basis of extensive training of clinicians before it can be administered, which limits its practicality. There are four modules that match age and communication levels of individuals from childhood to adulthood (New York State Department of Health Early Intervention Program, 1999).

At the current time, the CARS is the most commonly used instrument because of its ease of administration and brevity. However, the ADI–R and ADOS are the instruments currently used for research-based applications. They require special training and longer amounts of time to administer.

**Advances in the Treatment of Autism Spectrum Disorders**

**Influences on the Selection of Treatment Options**

Evaluating and choosing among the varied treatment options is an overwhelming task for parents of children with autism spectrum disorders and the professionals who support them. Although parents and professionals who work with any young child with an established condition face similar challenges, those who are concerned with autism spectrum disorders seem to face even greater challenges. These occur because of the significant individual differences in symptom presentation, as well as the heightened public awareness and constant information blitz around the treatment or, even worse, “cure of the month.”

The impact of the Internet on parents and professionals in the decision-making process is a matter of concern. The Internet is now serving as a direct referral source for programs, therapies, and products. The concern is that parents feel this information is valid even when it has not gone through a professionally based, peer review process. It is up to professionals in the field to evaluate and provide parents with the skills to assess these treatments independently (Jacobson, 2000).

**The Challenges in Evaluating Educational and Therapeutic Options**

Unfortunately, scientific evaluation of educational programs and treatment options has not kept pace with the explosive number of children being diagnosed with these disorders. Parents and professionals are forced to make decisions based on limited information. Freeman (1997) described the goal of any treatment as helping a person with autism become a fully functioning member of society. If an intervention does not work toward this goal, then it is not appropriate. She also contended that any treatment must be considered as one of several available choices. The pros and cons of each approach must be carefully assessed in terms of contributing
to the lifelong goal of independence in home and community life. Pratt et al. (2001) also stressed the importance of focusing on long-term goals. Freeman (1997) and the New York State Department of Health Early Intervention Program (1999) both have supported the importance of constant review and revision of the educational and therapeutic approaches to intervention to adapt to the developing child. It is extremely important to monitor and adjust the program or approach when a child is not making progress, as well as when a child is rapidly meeting individual goals.

Freeman (1997, p. 649) and National Early Childhood Technical Assistance Systems (1996, p. 2) have provided questions to ask when evaluating the adoption of a specific treatment: Will the treatment result in harm to the child? Is the treatment developmentally appropriate for the child? Has the treatment been validated scientifically? How will the treatment be integrated into the child’s current program? How will the child’s progress toward desired outcomes be evaluated? Is there a back-up plan if the intervention is discontinued? Have I gotten information about this approach from a variety of sources? Are there less restrictive or better researched alternatives? Perhaps the greatest assistance that the practicing psychologist can provide families is to candidly discuss options, base recommendations on scientific research, and share information about discredited therapeutic approaches.

**Expert Agreement on Components of Effective Early Intervention Approaches**

Although there is very little scientific research documenting the effectiveness of special education programs for young children with autism, there are a number of program models that have been reviewed by peers in the field. Hurth, Shaw, Izeman, Whaley, and Rogers (1999) stated that the standard of quality practice should be defined as those practices demonstrated by nationally known, well-established programs for toddlers and preschoolers with autism spectrum disorders. There are a number of areas of agreement in publications that seek to define appropriate and effective early intervention practices. There is agreement that (a) intervention should be provided at the earliest possible age; (b) intervention must be intensive; (c) parent training and support should be a component of the program; (d) the curriculum should focus on the social and communication domains; (e) instruction should be systematic with individualized goals and objectives; and (f) particular emphasis should be put on teaching for generalization.

There is agreement on the importance of providing intervention at the earliest possible time. Eligibility for programs should be determined in as time-efficient a manner as is possible. Early intervention provides the child with a functional communication system that allows him to communicate. Attention and help, and express protest or frustration in a socially acceptable manner before the development and practice of nonproductive or interfering behavioral repertoire occurs. It allows professionals to support families through the earliest stages of the grieving process and provides families skills in teaching and using behavioral strategies (Hurth et al., 1999; National Research Council, 2001; Powers, 1992; Pratt et al., 2001).

A second area of agreement is the provision of an intensive intervention program. Lovaas (1987) described successful outcomes for 47% of the children in his study who began treatment with 40 hr of one-to-one discrete trial teaching in the home environment. Treatment was later provided in a preschool setting. This level of success has not been replicated by other studies to date, but more recent research seems to support the need for at least 20–25 hr per week of systematic instruction for young children with autism (National Research Council, 2001; New York State Department of Health Early Intervention Program, 1999; Pratt et al., 2001; Sheinkopf & Siegel, 1998; Smith & Lovaas, 1997). Intensity is not defined only as the number of hours intervention is provided. Guralnick (1998) suggested that intensity may be defined as the amount of program provided during a specified time frame as above, as the duration or length of time a program is delivered long-term, or even as the comprehensiveness or number of elements or services provided to a child. Powers (1992) added to this definition the idea of the number of environments in which the teaching occurs, as well as the educational validity of the interventions provided. Hurth et al. (1999, p. 23) expressed the idea that the intensity of engagement contributes to the effectiveness of quality programs. Engagement can occur in a number of different ways, which include one-to-one instruction, children engaged independently in planned activities, adult-led group instruction, activity-based instruction, instruction that takes place during daily activities, activities planned by the program and implemented by the family, and activities planned by the program and implemented in the community. Strain, Wolery, and Izeman (1998) supported taking a “waking hour approach” to intervention to provide intensity to young children. This approach supports intervention through engagement whenever the child is awake, using a variety of approaches in a variety of program and natural environments. It includes written performance criteria that target generalization of skills across people, materials, and environments.

The third area of agreement is that parent education and involvement should be included in early intervention and preschool programs for children with autism spectrum disorders (Dawson & Osterling, 1997; Hurth et al., 1999; National Research Council, 2001; New York State Department of Health Early Intervention Program, 1999; Powers, 1992; Pratt et al., 2001). The role of parents in the education of their child with autism can range from parents acting as therapists or cotherapists (Lovaas, 1989; Short, 1984; Schopler et al., 1984) to parents attending meetings to assist in the development of an individual family support plan or an individual preschool education or individual education plan. The Individuals With Disabilities Education Act, as reauthorized in 1997, increased the role of parents in the special education process. For family members to be partners with professionals and programs serving their children, they need information and advocacy training. Strain et al. (1998) stated that the goal should be to assist parents in becoming independent problem solvers related to their children. The New York State Department of Health Early Intervention Program (1999) describes other goals for parent involvement that include improving the interaction between the child and the family and increasing parent satisfaction, which reduces parent stress. They also noted that parents are the people who ensure continuity across the life span of the child.

A fourth area of agreement is the importance of having a program focusing on social and communication skills as a critical component of the curriculum (Powers, 1992). Because the core deficits in autism revolve around these two areas, respected programs provide activities and routines that focus on these skills.
MacDonald (1989) and Sussman (1999) have supported following the child’s lead and engaging in child-initiated interactions to improve attention, engagement, reciprocal interaction, and communication. However, child-directed or child-centered and other-directed or teacher-centered approaches to instruction have not been comparatively evaluated at this time for either efficacy or effectiveness.

A fifth area of agreement is the use of carefully planned, individualized systematic instruction based on the principles of applied behavior analysis (ABA). Powers (1992) described the importance of having a scope and sequence of lessons that is clearly structured within and across behavioral objectives, specificity in target behavior selection for each child, data-based decision making regarding teaching programs to permit timely and responsive modification of strategies, instructional strategies chosen based upon the skills to be taught and the child’s unique learning style, and individualized motivational systems (pp. 231–233). Verbal behavior analysis is a behavioral teaching approach being used to target communication skills that provides a defined prompting hierarchy and skill-teaching sequence. Like other ABA strategies, it is based on the work of B. F. Skinner and was adapted for children with developmental disabilities by Sundberg and Partington (1998). At this time, however, there are few empirical studies comparing the efficacy of verbal behavior analysis with other behavior analytic strategies for development of communication skills.

The sixth area of agreement is that program components are programming for generalization. Educational and therapeutic programs cannot feel that they have succeeded in teaching a skill if the child is not able to use that skill at home or in community activities. Strategies to increase generalization include using naturally occurring reinforcers; training diversely across materials, people, and settings; and training loosely. Generalization must also occur if a child is to progress from learning in one-to-one and small group settings to larger groups and to progress from an intense, direct instruction approach to more natural instructional procedures (New York State Department of Health Early Intervention Program, 1999; Powers, 1992; Stokes & Baer, 1977).

The Push for Inclusion

The Individuals With Disabilities Education Act, amended 1997, stresses the importance of the child with disabilities having access to the general education curriculum. For preschool students with autism spectrum disorders, this suggests participation in programs and activities in which other preschool children participate. Powers (1992) supported integration with typical peers but stressed that physical integration alone is insufficient. Strain et al. (1998, p. 10) also cautioned that physical inclusion of children with autism spectrum disorders is not more defensible than segregated programs unless the programs include staff training, ongoing support, and planned instruction embedded into ongoing activities and routines. The research on the benefits of inclusion for young children with autism is equivocal. A study by Harris, Handlerman, Kristoff, Bass, and Gordon (1990) compared progress on a measure of language development for children with autism in segregated and integrated settings and found no significant amount of difference between the two groups. Both groups made better than normative progress in rate of language development. It is common for segregated programs to target the development of communication, social, and imitation skills that will enhance the benefits for the child of transition to more inclusive early intervention or preschool services and to identify such transition as one of many typical objectives for young children.

A Plethora of Other Interventions for Young Children With Autism Spectrum Disorders

Professionals are often called on to make decisions or give advice regarding the variety of treatment options available for young children with autism spectrum disorders. These interventions include biomedical treatments such as vitamins and minerals, gluten-casein free diets, auditory integration therapy, craniosacral manipulation, and secretin to alleviate the behavioral symptoms of autism. Other therapeutic approaches such as sensory integration, facilitated communication, and holding therapy may also be requested by parents of young children with autism. There is no broad consensus, and a paucity of research, regarding many of these treatments. A discussion of all of these approaches is beyond the scope of this article, but the same types of questions and criteria listed above should be considered in addressing these issues. Gerlach (2000) provided a starting point for parents and professionals desiring information on these topics.

Guarded but Improving Outcomes

Although it is difficult to predict with any certainty the outcome for a specific child, or even a specific subtype of autism spectrum disorders, some outcome data are available. As previously described, Lovaas (1987) found good outcomes for 47% of his sample who received intensive, behaviorally based, early intervention. More recent research on early intensive, behavioral intervention supports gains in intellectual functioning, but not at the level that Lovaas reported. Eikeseth, Smith, Jahri, and Eldevik (2002) found that children who received behaviorally based intervention made more progress than children who received a more eclectic approach. The authors did report that the implementers of the behaviorally based treatment received more supervision than those in the other group, which may have contributed to the results. Fenske, Zalenski, Krantz, and McClannahan (1985) found that children who began intervention before age 5 had better outcomes than those who began the same program after age 5. Smith (1999) analyzed 12 peer-reviewed outcome studies, which focused on early intervention for children with autism. Nine of these were behavioral programs, and 3 were from other types of programs. The mean gains in IQ were higher in the behavioral programs than in the others, ranging from 7 to 28 points in the behavioral programs and 3 to 9 points in the other three studies. Unfortunately, the research that has been undertaken to evaluate the effectiveness of programs for young children with autism has generally used small sample sizes and has had inadequate controls. Many studies have used outcome measures in the area of cognition and have not measured growth in the areas of social interaction and communication. Although treatment research is difficult to implement, future efforts must include more of these types of outcome measures with larger groups of children.
Screening, Assessment, and Diagnosis

Psychologists in practice will find themselves more involved with young children with autism as the numbers of children showing the range of symptoms associated with this disorder increase. The varied presentation of the symptoms displayed creates different conclusions among professionals, and making referrals or seeking assistance from professionals with expertise in autism will help all professionals increase their own skills and frames of reference. Their roles are expanding to include identifying these youngsters under the age of 3 years, serving on multidisciplinary teams to both diagnose and treat young children, and providing support and education to families through the diagnostic process. Just as families are bombarded with information in this rapidly growing area, professionals must also exercise judgment in their review of biomedical research, its effects on intervention, and the increasing number of screening and assessment instruments. Translating this research into meaningful language will assist families in making sound decisions on behalf of their children and themselves.

Intervention

Determining appropriate intervention for children with autism is a complex issue. There is little research being reported that provides the experimental controls necessary to make generalizable conclusions. Sometimes, a great deal of emotionality is attached to treatment approaches, with many professionals promising results that are not proven to be deliverable. Supporting, yet respecting, families as they participate in the program-planning process is a role for which psychologists are especially well suited. It is important for psychologists to assist the intervention team in the design of a curriculum and development of strategies that match the child’s learning style and individual strengths and weaknesses. Many psychologists may be asked to help schools, agencies, and families implement programs to reduce the challenging behaviors these children present. The practicing psychologist has a role in a periodic review of a program to ensure that the child is making progress and in troubleshooting the present program to make necessary changes. All psychologists working with young children should seek out the information, which will allow them to provide a range of services to these complex children and their families.

References


Implications for Practicing Psychologists

Screening, Assessment, and Diagnosis

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Received August 9, 2001
Revision received July 23, 2002
Accepted September 12, 2002