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Empirically Supported Intervention Practices for Autism Spectrum Disorders in School and Community Settings: Issues and Practices

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With the increasing numbers of children who qualify for a diagnosis of autism spectrum disorders (ASDs), researchers have also seen a contemporaneous increase in the number of interventions available to families of children with autism. Unfortunately, many interventions lack a sound research foundation and are minimally effective or ineffective altogether. Furthermore, research suggests that an eclectic approach to intervention for children with autism is less effective than a single, intensive, scientifically sound intervention in terms of improving cognition, language, and adaptive behavior (Howard, Sparkman, Cohen, Green, & Stanislaw, 2005). Because the earlier that intervention starts the higher the likelihood of more positive outcomes (L. K. Koegel, 2000), ineffective and inefficient interventions can be damaging to the development of a child with autism. In short, if we are to accelerate the habilitation process during the early years, efficacious, effective, and efficient individualized interventions are critical.

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Despite the strong and immediate need for effective and comprehensive programs, many children are not receiving adequate programs. In fact, lawsuits relating to the appropriateness of school programs for children with autism represent the fastest-growing and most expensive area of litigation in special education (Etscheidt, 2003). The analysis of administrative and judicial hearings provides information on the areas of dispute between school districts and parents of children with autism. Analyzing the rulings on these lawsuits can help us to understand shortcomings of educational programs. Three primary areas of litigation emerge from the legal rulings that relate to (a) the matching of individualized education program (IEP) goals to evaluation data; (2) the qualifications of the school personnel; and (3) the adequacy of the selected intervention in helping children make progress toward meeting the IEP goals (Etscheidt, 2003).

While these three areas are interrelated, each has been ruled on in separate cases. In regard to matching the evaluation data to IEP goals, schools need to conduct a valid evaluation and, consequently, use that evaluation to develop appropriate educational goals that will result in educational benefit for the child with autism. This necessitates having trained and competent assessors who implement comprehensive evaluations and to consider any independent evaluations (Etscheidt, 2003). In regard to the qualifications of the school personnel, the IEP teams must be able to competently evaluate the child (knowing the child *and* appropriate evaluation procedures) as well as provide placement options. Generally, the schools have lost cases in which school staff did not have an expert or expertise in the area of autism. To determine whether an IEP constitutes a free and appropriate education, the school district must have a methodology for teaching so that the child will benefit. If a child is indeed benefiting from the intervention, the courts are unlikely to intervene in deciding which particular methodology a child should receive, such as an applied behavior analysis (ABA) versus a TEACCH (Treatment and Education of Autistic and Related Communication Handicapped Children) program (National Research Council, 2001). However, if a child is not making adequate gains toward the IEP goals because the school did not use an appropriate methodology, the schools may have to incur any private expenses the family paid to specialists, provide compensatory education, and revise the child's program (Etscheidt, 2003). Again, evaluating and understanding these cases can help professionals avoid stressful, expensive, and time-consuming litigation by understanding the courts' decisions in determining how best to educate children with autism. In brief, families of children with autism want programs that are scientifically sound, with measurable gains, and well-trained staff supervising and implementing the programs.

In this light, the purpose of this chapter is to provide scientifically sound techniques of positive behavior support (PBS) that are effective for children with autism in school and community settings. We also discuss this in the context of important themes that need to be considered with children with autism. That is, effective intervention programs are only successful if specific underlying procedures are in place. These include attention to tracking the child's progress, the settings in which intervention is implemented, attention to the child's affect, coordination across environments, the specific goals that are selected, and the competency of the staff. All of these areas

should be considered when developing maximally effective interventions within the context of positive behavior programs and are discussed in detail in this chapter. Lack of attention to these issues may result in ineffective programs and increases in the child's problem behaviors.

EMPIRICALLY VALIDATED INTERVENTION PROCEDURES AND RESPONSE TO INTERVENTION MONITORING ARE CRITICAL

As stated, a number of different interventions are available for children with autism, some of which are empirically validated as effective; others have been shown to be ineffective or even, in some cases, harmful. Simpson (2005) evaluated over 100 various types of programs, including interpersonal relationship interventions and treatments, skill-based interventions, cognitive interventions, psychological/biological/neurological interventions, and other related interventions. These interventions were rated in regard to the research findings that support the methodology. Four programs emerged as having undergone a substantial amount of research, with evidence repeatedly and consistently showing that individuals with autism display significant improvements as a result of the intervention. These four programs are ABA (Lovaas, 1987), discrete trial teaching (DTT), pivotal response teaching (PRT) (Koegel, R.L. & Koegel, 2006), and Learning Experiences, an Alternative Program for Preschoolers and Parents (LEAP) (Strain & Hoyson, 2000). These four techniques are supported by a plethora of scientifically sound research studies showing the effectiveness of the interventions in a wide variety of areas. Again, school and community-based programs have the highest likelihood of positive change as well as decreased litigation if effective empirically validated strategies are implemented by competent staff.

The child's response to intervention (RTI) is also important. Regardless of setting, some type of measurement system needs to be intact that will track the child's progress. This necessitates taking data prior to the start of implementing an intervention. Ideally, at least two representative data points, without an increasing trend, help confirm that changes are not a result of maturation. While there are a number of interventions available for children with autism, there is also considerable diversity within the diagnosis itself. Thus, programs that are effective with one child may not necessarily be effective with all children labeled as having autism. To be assured that a child is responding and improving when an intervention is implemented, careful, systematic, and ongoing monitoring needs to be in place (Reschly, 2004)

NATURALISTIC INTERVENTIONS ARE MOST EFFECTIVE

Children with autism often have difficulties with generalization and spontaneity. A number of research studies have shown that naturalistic interventions result in greater generalization. For example, McGee, Krantz, and McClannahan (1985) showed that incidental teaching resulted in greater generalization and more spontaneity than nonnaturalistic approaches.

R. L. Koegel, O'Dell, and Koegel (1987) also showed that children learned faster and exhibited great generalization when naturalistic interventions were used rather than a more structured setting that used arbitrary materials and rewards. Miranda-Linne and Melin (1992) showed that naturalistic strategies resulted in greater generalization and equal or more spontaneity than a more structured format. Such settings usually include intervention in natural environments, the use of actual items rather than flash cards or other types of unnatural stimuli that are not found in the student's natural environment, rewards that are intrinsically related to the task, and incorporating meaningful activities.

INCLUSIVE EDUCATIONAL SETTINGS ARE PREFERABLE

One major goal of inclusion is to facilitate the social development of children with disabilities (Harrower, 1999; Harrower & Dunlap, 2001). In general, research investigating inclusion as an educational intervention has been quite positive (Harrower & Dunlap, 2001; Odom, 2000). Specifically looking into social outcomes, inclusion has been effective for children with autism and other severe disabilities by increasing social interactions, social contacts, friendship networks, reciprocal social support, durable relationships, and importance ratings of peers as nominated by the focal students with disabilities (Fryxell & Kennedy, 1995; Kennedy, Cushing, & Itkonen, 1997; Kennedy & Itkonen, 1994; Kraemer, Blacher, & Marshal, 1997). Investigations comparing the outcomes of children with severe disabilities in inclusive and noninclusive settings have shown that the integrated classroom is *at least* comparable, if not more conducive to developmental progress (Bricker, 2000; Cross, Traub, Hutter-Pishgahi, & Shelton, 2004; Gelzheiser, McLane, Meyers, & Pruzek, 1998; Holahan & Costenbader, 2000; Odom, 2000). As a case in point, consider a study by Holahan and Costenbader (2000) that assessed the outcomes of 15 children with disabilities placed in inclusive classrooms compared with another 15 placed in self-contained classrooms. While initially matched at preassessment, results of a postassessment measuring social-emotional development indicated that children with disabilities educated in the inclusive environment often outperformed their counterparts (Holahan & Costenbader, 2000). Further, Fisher and Meyer (2002) conducted a longitudinal study that followed children with severe disabilities over a 2-year period in the context of a group design. The students were matched on chronological age and scales of behavior, including motor, social, language, and daily living. Results showed that children with disabilities who were included made significantly more progress on social competence and a variety of areas of developmental domains than the children who were placed in segregated classes. Thus, as a whole, the data support the inclusion of students with autism and other significant disabilities in regular education classes for both social and academic development.

Other researchers have compared inclusive and segregated programs by examining developed IEPs of children with severe disabilities served within each setting. Surprisingly, regardless of placement, the majority of

IEPs for children with autism do not involve social objectives despite the obvious need for such goals (Brown, Odom, & Conroy, 2001). However, IEPs written for students with severe disabilities in integrated classrooms include more social goals and are of higher quality, in contrast to IEPs written for students placed in segregated environments (Espin, Deno, & Albayrak-Kaymak, 1998). Given that children with autism have such severe deficits in social skills, some researchers have argued that educating these students in autism-only settings is inappropriate (Strain, 2001).

In addition to looking at outcomes of children with autism in included classrooms, researchers have importantly investigated the academic and social effects on the typical children. Odom, Deklyen, and Jenkins (1984) assessed the cognitive, language, and social performance of typical children in integrated and nonintegrated classrooms and found no negative effects of inclusion. Similarly, Salend and Duhaney (1999) found no negative effects on the instructional engagement time or academic performance of typical children as a result of having children with disabilities included in the classroom. Moreover, the authors presented findings that typical children who participated in cooperative learning groups with children with disabilities outperformed other typical children in a traditional classroom in the areas of reading and math. In terms of social outcomes, it has been shown that typical children benefit in meaningful ways as a result of their experiences in inclusive classrooms. Specifically, peers have expressed increased acceptance, understanding, and self-concept as well as friendships with and positive views of the included students with disabilities (Salend & Duhaney, 1999). Corroborating these findings, Kamps, Kravits, and Gonalez-Lopez (1998) interviewed 203 typical children (across a 5-year span) who participated in social activities with children with disabilities. Findings indicated that the majority of the children expressed that they enjoyed participating in the programs and perceived academic and social benefits as a result. Thus, as a whole, inclusion appears to be beneficial not only for the child with autism, but also for typically developing children.

Again, as the database accumulates, it is becoming generally agreed that a foundation consisting of an individualized plan for targeting social competency and opportunities for interaction with socially competent peers needs to be established to provide students with autism a socially beneficial education. To accomplish this, physical inclusion with same-aged typical peers, while necessary, is not sufficient in addressing the comprehensive social needs of students with autism (Hemmeter, 2000; Wolery & Gast, 2000). Rather, *supported inclusion*, a term that implies physical integration along with the use of effective instruction and embedded learning opportunities, appears to be necessary to achieve positive outcomes (Hemmeter, 2000; Horn, Lieber, Li, Sandall, & Schwartz, 2000; Janney & Snell, 1997; Wolery & Gast, 2000). In other words, inclusion should be considered a "reallocation of specialized educational services" and not a lone intervention (Harrower & Dunlap, 2001, p. 764). In summary, while there have been improvements in accepting inclusion in philosophical terms, the successes of inclusive programming only occur when careful and systematic programming of goals and effective intervention are in place.

MOTIVATION IS CRITICAL FOR LEARNING AND REDUCING BEHAVIOR PROBLEMS

It is now well documented that most behavior problems have a communicative function (Carr, 1997; Iwata, Smith, & Michael, 2000; R. L. Koegel, Koegel, & Dunlap, 1996). To reduce behavior problems, many researchers have focused on antecedent manipulation and proactive strategies. Koegel, Koegel, and Surratt (1992) showed that specific motivational strategies (described in this section below) incorporated into the intervention greatly reduces disruptive behaviors while simultaneously improving learning. In general, the motivational teaching techniques (also called *milieu teaching* and PRT) are defined as "a family of procedures that are designed to capitalize on children's desires and interests in their natural environments to embed teaching opportunities" (Goldstein, 2002, p. 387). Again, these are generally more efficient than traditional analogue therapies in that the techniques promote generalization from the onset (Delprato, 2001; Gillum, Camarata, Nelson, & Camarata, 2003; R. L. Koegel et al., 1987). For example, PRT is a systematic approach that is implemented within the child's daily routines via parents, teachers, clinicians, and peers (L. K. Koegel, Koegel, Harrower, & Carter, 1999; Pierce & Schreibman, 1995). The intervention efficiently focuses on key, researched, "pivotal" areas (i.e., a group of behaviors from a single response class), which result in collateral improvements across untargeted skills, leading to the improvements in the overall quality of social-communicative interactions (R. L. Koegel & Frea, 1993; R. L. Koegel & Koegel, 1995).

Similarly, incidental teaching (Hart & Risley, 1968; McGee, Almeida, Sulzer-Azaroff, & Feldman, 1992; McGee, Morrier, & Daly, 1999) utilizes "teachable moments" within the child's natural environment to provide instruction based on the child's interests and routines. The Walden Early Childhood Program is a university-based center where teachers and, uniquely, typical peers implement the incidental teaching techniques within the inclusion classrooms. In a study by McGee et al. (1999), 82% of the children exiting the preschool program exhibited functional verbal language, and all but one participant improved in peer proximity levels. Similarly, studies of PRT suggest that at least 85–90% of children exhibited functional verbal language if intervention started before the age of 5 (L. K. Koegel, 2000).

Important motivational procedures include the following:

1. Allowing the child to choose the stimulus materials and activities within the context of the intervention.
2. Task variation rather than repetitively drilling the child.
3. Interspersing maintenance tasks so that the child experiences success and behavioral momentum.
4. Using natural reinforcers, inherently connected to the activity, rather than arbitrary rewards, to emphasize the response-reinforcer contingency.
5. Rewarding attempts rather than using a stricter shaping paradigm.

These components, as a package, result in higher levels of correct responding (R. L. Koegel et al., 1987), improved affect (R. L. Koegel, Bimbela, & Schreibman, 1996), and lower levels of disruptive behavior (Koegel, Koegel, & Surratt, 1994). Again, these procedures result in lower levels of problem behaviors and thus can be viewed as a PBS package in the context of an antecedent intervention.

COLLABORATION AND COORDINATION RESULTS IN MORE RAPID AND GENERALIZED LEARNING

It is believed by many that family-school collaboration is essential in developing appropriate, effective educational plans for individuals with disabilities, and that the successful inclusion of these students can only be achieved via family support (Duhaney & Salend, 2000; Soodak & Erwin, 2000). Given that children develop, learn, and behave within the context of multiple systems (e.g., family, school, community), it appears to be important that schools operate within the ecological or systems framework as they attempt to meet the needs of students with disabilities and other challenges (Bernheimer & Keogh, 1995; Bronfenbrenner, 1986; Ho, 2002; Lucyshyn & Albin, 1993; Ruble & Dalrymple, 2002; Santarelli, Koegel, Casas, & Koegel, 2001; Turnbull, Blue-Banning, Turbiville, & Park, 1999). One critical component of this framework is the family-school partnership.

Research has shown that family-school partnerships are positively associated with educational outcomes for children with challenges (Albin, Lucyshyn, Horner, & Flannery, 1996; Bronfenbrenner, 1986; Christenson, 2004; Dunlap & Fox, 1996; Ho, 2002; Lucyshyn & Albin, 1993; Minke & Anderson, 2005; Osher & Osher, 2002; Peterson, Derby, Berg, & Horner, 2002; Ruble & Dalrymple, 2002; Turnbull & Turnbull, 1996; Wacker, Peck, Derby, Berg, & Harding, 1996). Furthermore, the active involvement of family members in the assessment-planning-intervention process increases the generalization, maintenance, and social significance of the targeted goals (Lucyshyn, Albin, & Nixon, 1997; Moes & Frea, 2000; Peterson et al., 2002; Ruble & Dalrymple, 2002; Stiebel, 1999). In other words, when parents are positively and effectively included as active team members, the benefits of educational treatments for children are more fully realized.

Researchers have outlined a host of recommended practices as a means to guide the development and maintenance of successful partnerships (e.g., Brookman-Frazee, 2004; Christensen, 2004). First, it is suggested that schools adopt a family-driven approach (instead of a provider- or resource-driven approach) that focuses on strengths and solutions, ecological variables, social validity, and the family's quality of life (Christenson, 2004; Dinnebeil, Hale, & Rule, 1999; Lucyshyn & Albin, 1993). Second, it appears to be important that all team members experience shared responsibility and shared decision making and have a strong commitment (Minke & Anderson, 2005; Osher & Osher, 2002). Third, relationship-building opportunities to enhance mutual trust, respect, and

ongoing communication appear to be critical, as is administrative support in the allocation of training and resources (K. S. Adams & Christenson, 2000; Dinnebeil et al., 1999; Lucyshyn & Albin, 1993; Minke & Anderson, 2005; Osher & Osher, 2002). Finally, personality variables such as enthusiasm, friendliness, and cooperativeness have also been found to positively affect the relationship (Dinnebeil et al., 1999). In short, schools have the power to influence parent participation by their responsiveness, their attitudes, and the opportunities they create for interaction and communication (Ho, 2002). That is, schools that collaborate with parents not only may improve their ability to affect positive changes in the lives of their students, but also may reduce unfavorable situations, like litigation (Ruble & Dalrymple, 2002).

Because the literature shows that parents play a key role in the overall educational success of their children (Duhaney & Salend, 2000; Soodak & Erwin, 2000), it is important to know how they feel about topics such as inclusion. In regard to inclusion, parent perceptions have been mixed and multidimensional (Duhaney & Salend, 2000; Gibb, Young, Allred, Dyches, Egan, & Ingram, 1997; Palmer, Fuller, Arora, & Nelson, 2001). For the most part, however, parents of children with and without disabilities have positive views toward inclusion and express many perceived benefits (e.g., learned prosocial behaviors) (Duhaney & Salend, 2000; Giangreco, Edelman, Cloninger, & Dennis, 1993; Seery, Davis, & Johnson, 2000).

Parents who are hesitant or resistant to placing their child in regular classrooms tend to attribute their unfavorable view of inclusion to teacher qualities (e.g., uncaring, incompetent) and classroom qualities (e.g., insufficient support, hostile, inappropriate given child's disability), as opposed to child qualities alone, although parents of children with severe disabilities are less likely to favor educational inclusion than parents of children with mild disabilities (Palmer et al., 2001). Results from a regression analysis by Kraemer et al. (1997) indicated that adolescent-specific variables (over family characteristics) predicted level of educational inclusion despite the fact that the Individuals With Disabilities Education Act (IDEA) mandates that placement not be determined by a child's functioning level. Parents in the study actively included their adolescents with severe disabilities, regardless of age or functioning level, in social and community outings. However, integration in typical school settings for this same group was minimal, with only 4% fully included (Kraemer et al., 1997). While there are a number of different reasons why this might be the case, the general discrepancy between the levels of inclusion at home and school is concerning. The authors wondered if the level of inclusion at school would have been improved had parents played a more active role in the decision-making process and understood the possible benefits of inclusive school settings.

However, as a whole, researchers have made numerous recommendations for increasing the likelihood that inclusion will continue to expand for children with autism. Indeed, several intricate components need to be in place at the state, district, building, and classroom levels (Mamlin, 1999). To begin, strong leadership from the top down and a universal design consisting of positive behavioral supports and established best practices

are highly recommended (Mamlin, 1999; Renzaglia, Karvonen, Drasgow, & Stoxen, 2003). Best practices for inclusion include the principle of normalization, developmentally appropriate practices (DAPs), individualization, and collaboration (Cross et al., 2004). Second, assessment and planning within the inclusive program should be person and family centered and strength based and involve ecological analyses (Mamlin, 1999; Renzaglia et al., 2003). Third, as a means of maintaining a well-devised plan, school personnel should have positive attitudes, a belief in shared responsibility, and necessary training and support; parents should be involved and satisfied with their child's progress, and parent-teacher communication and collaboration must be intact (Cross et al., 2004). Finally, evaluations must indicate that the children are attaining their individualized goals, actively engaged, interacting with typical peers, and acquiring skills in the general education curriculum (Cross et al., 2004). As stated by Odom and Strain (2002), "Programs, not children, have to be 'ready' for inclusion" (p. 156).

Most commonly used discipline systems, including many schoolwide support systems, are ineffective with children with autism

Many school administrators and teachers use the same type of discipline systems for children with autism as are being used for their typically developing students. Because children with autism are not generally as socially motivated as their peers, many of the reward systems (e.g., praise) and punishment procedures (time-out, sending to principal's office, sending home from school, and so on) are frequently ineffective. In an effort to review the literature on evidence-based interventions available to schools, the next section presents schoolwide, classroomwide, and individualized techniques that are designed to effectively address the needs of students with autism within the school setting.

Literally hundreds of programs have been developed to address behavioral, social, and academic needs at the schoolwide level (Borman, Hewes, Overman, & Brown, 2003). In a meta-analysis of over 230 studies, Borman et al. identified three models as having demonstrated the "strongest evidence for effectiveness:" Direct instruction (G. Adams & Carnine, 2003; Carnine & Engelmann, 1984), Comer's School Development Program (Cook, Murphy, & Hunt, 2000; Haynes, Comer, & Hamilton-Lee, 1988), and Success for All (Borman et al., 2005). Each of these programs has been data driven, successfully "scaled up" (Elias, Zins, Graczyk, Weissberg, 2003; Hanley, 2003), replicated (Borman et al., 2003, 2005), and deservedly received much attention for producing positive outcomes for students considered academically and, to a lesser extent, behaviorally at risk.

An empirically validated, school wide intervention that seems particularly relevant for the behavioral needs of children with mild-to-severe disabilities is PBS (Bagnell & Bostic, 2004; Ervin et al., 2001; Fisher-Polites, 2004; R. L. Koegel, Koegel, et al., 1996; Lewis, Powers, Kelk, & Newcomer, 2002; McCurdy, Mannella, & Eldridge, 2003; Netzel & Eber, 2003; Smith & Heflin, 2001; Snell, Voorhees, & Chen, 2005; Turnbull, Wilcox, & Stowe, 2002).

PBS is an approach that evolved from traditional ABA, which focused on experimental control, internal validity, and the microanalysis of the child. In addition, PBS focuses on practicality, feasibility, and meaningful outcomes as perceived by the consumer, external validity, and the macroanalysis of systems (Carr, 1997). Given that schools are complex, multidimensional environments within which children are socialized among their peers, it is important that effective and efficient practices, structures, and routines be in place (Sugai et al., 2000). PBS is an approach that offers to link these environments to empirically validated strategies to achieve sustained, meaningful, positive behavior change (Sugai et al., 2000).

The developers and proponents of PBS (and other universal interventions) propose a three-tiered systems model (borrowed from public health services; see Asarnow & Koegel, 1994) to prevent the occurrence of problem behavior as well as to reduce the frequency and intensity of chronic problems (Gresham, 2004; Lucyshyn, Dunlap, & Albin, 2002). At the primary level, universal interventions (i.e., schoolwide) target 80–90% of the students and work to reduce the number of new cases. For the 5–15% of students at risk for behavior problems, the secondary level offers specialized, small-group interventions that work to reduce the number of current cases. For the remaining 1–7% with serious (i.e., severe, chronic, or intense) negative behaviors, the tertiary level includes individualized interventions that target the reduction in the intensity and complexity of current problem behavior (Walker et al., 1996). Within each of these levels, functional behavioral assessments are used to evaluate student behavior within the context of specific school environments (e.g., classroom, playground). As Reschly (2004) discussed, this model moves us away from the insufficient "refer-test-place" approach, toward an RTI model by which intervention intensity is matched to problem severity, as determined by data-based evaluations and subsequent treatment adjustments (when necessary).

As mentioned, although students diagnosed with ASDs may benefit from universal interventions and having systematic PBS programs in place in schools may benefit the child with autism indirectly; the disability presents complex challenges requiring intensive, comprehensive programming. Furthermore, given the legal and social push for inclusive educational placements, the composition of the regular classroom is diversifying rapidly (Hemmeter, 2000). Thus, within the context of individual classrooms, the need for effective and efficient secondary (i.e., classwide) and tertiary (i.e., highly individualized) intervention components is greater than ever before.

Currently, it seems that most educational programs available for children with autism are limited in that they provide either participation in integrated activities or effective systematic instruction (Bricker, 2000; Hemmeter, 2000). Less common are programs that offer both simultaneously. However, to maximize educational (e.g., social, instructional) benefits for students with autism, it is recommended that secondary and tertiary interventions consist of effective instruction *embedded within* integrated activities and routines (Hemmeter, 2000; Wolery & Gast, 2000).

Brown et al. (2001) suggested that practitioners utilize a decision-making hierarchy as a guide to identifying effective, efficient, functional,

and normalized interventions. The proposed hierarchy begins with three classwide approaches: DAPs and effective interventions built into inclusive early childhood education programs. This level of intervention aims at creating an inclusive, socially conducive environment by incorporating socially responsive typical peers, age-appropriate engaging activities, structured learning centers, and techniques designed to promote positive attitudes about individuals with disabilities (Brown et al., 2001).

Next, the hierarchy moves toward a smaller unit of analysis: child-peer interactions. This level includes incidental teaching, friendship activities, and social integration activities. Examples of these activities entail mutually reinforcing activities, environmental arrangements, peer mediation, "buddies," and so on. Finally, provided that additional instruction is required, the hierarchy delineates explicit socialization training, including extensive work with peers and the target child. While Brown et al.'s (2001) hierarchy is aimed at early education; it can be modified for older children. For example, the secondary and tertiary levels may include interventions such as buddy systems, peer tutoring, cooperative learning groups, peer networks, group contingencies, initiation training, priming, and self-management.

SOCIALIZATION IS EQUALLY IMPORTANT AS ACADEMIC DEVELOPMENT

Children with autism have far fewer play dates and spend less time interacting with peers than do typical children (L. K. Koegel, Koegel, Frea, & Fredeen, 2001). Often, the children socially isolate themselves at recess, lunch, and free time and engage in fewer afterschool peer-related activities. Social isolation in childhood can lead to difficulties with later employment, leisure activities, and mental health. Thus, it is extremely important that children with autism have comprehensive social programs implemented at both school and home. A number of effective techniques and comprehensive programs exist to improve socialization in children with ASD; however, issues concerning meaningful and generalized global social improvement that lead to reciprocal friendships in the lives of children with autism have yet to be fully understood (Hurley-Geffner, 1995). For example, children with Asperger's and high-functioning autism (HFA), as compared to their typical peers, are more likely to experience unilateral friendships (Guralnick, Gottman, & Hammond, 1996); poorer quality friendships (Bauminger, Shulman, & Agam, 2004); friendships with younger children; and friendships only with children with disabilities (Bauminger & Shulman, 2003). Further, they often experience loneliness (Bauminger & Kasari, 2000). Hurley-Geffner (1995) suggests that a prerequisite step to helping these children to develop meaningful friendships may be to establish methods of defining and measuring *friendship* as a variable and then subsequently examining ways to facilitate its development.

Researchers have acknowledged that children with ASD also need adequate opportunities to use newly learned skills to develop meaningful relationships with same-aged peers (Bauminger & Shulman, 2003). District

and state-level administrators play a key role in the selection of programs designed to facilitate socialization in schools. Odom (2000) explained that policy and the subsequent allocation of funding drive practice, and that the interpretation of the policy by significant administrators has a major impact on the implementation of the inclusive program. At the building level, research indicates that school principals play an important role in the attitudes and practices of inclusion given that their leadership and values influence teachers and help shape the culture of the school at large (Bricker, 2000; Mamlin, 1999; Praisner, 2003). As suggested by Praisner (2003), principals' positive views of inclusion are often associated with a higher likelihood of students being placed in inclusive classrooms. Moreover, positive experiences with students with disabilities are associated with more positive views of inclusion. While some principals view inclusion in a positive light, studies (Barnett & Monda-Amaya, 1998; Praisner, 2003) have shown that most believe that it is more appropriate for those with mild disabilities. In addition, most are uncertain about how to make inclusion "work" and feel that their teachers are not prepared to successfully include students with disabilities, particularly those with moderate-to-severe disabilities like autism (Barnett & Monda-Amaya, 1998; Praisner, 2003).

Similarly, teachers have mixed feelings about inclusion in general (Bricker, 2000; Soodak, Podell, & Lehman, 1998). However, unlike the data that show no relationship between principals' attitudes on inclusion and years of experience (Barnett & Monda-Amaya, 1998), there is a positive correlation between teachers' hostility toward inclusion and years of teaching experience (O'Conner & French, 1998; Soodak et al., 1998). One possible explanation for the decline in teacher attitude over the years may be negative experiences due to inadequate support. Researchers have repeatedly documented teachers' concerns over the lack of training and support (Kavale & Forness, 2000; Salend & Duhaney, 1999; Scruggs & Mastropieri, 1996). In fact, studies have reported a positive relationship between levels of support and training and teachers' "comfort" level with inclusion (Sadler, 2005; Seery et al., 2000). Furthermore, there is some evidence that less assistance and less social support are associated with teacher burnout, particularly when more than 20% of the students in the classroom have a disability (Talmor, Reiter, & Feigin, 2005). In contrast, it has been shown that initial hesitation can evolve into positive attitudes when supports are in place (Janney & Snell, 1997).

If children with disabilities require support and training and those two resources are inadequately available (at least as perceived by teachers), then it is not surprising that teachers, along with principals, are less willing to include these students. Successful inclusion (e.g., children's satisfaction, amount of time included, teacher and child receptivity, positive behavior change) is predicted by teachers' positive attitudes (Cross et al., 2004; Kavale & Forness, 2000) and the interactions or relationship the teacher has with the included student (Pianta & Stuhlman, 2004; Robertson, Chamberlain, & Kasari, 2003; Wigle & Wilcox, 1996). Further, teachers' attitudes are predicted by adequate training and support as well as teacher efficacy (Cross et al., 2004; Salend & Duhaney, 1999; Soodak et al., 1998). Thus, a beginning step in fostering successful inclusive

practices schoolwide may be providing adequate training and support to classroom teachers, even at the level of preservice teacher education programs (Eichinger & Downing, 2000; Rainforth, 2000), as a means of reducing anxiety and burnout and increasing teacher efficacy, attitudes, and comfort levels (Seery et al., 2000).

STAFF TRAINING IS ESSENTIAL

As discussed, staff training and support are critical for successful inclusive settings. One of the most commonly used supports for children with autism (and other severe disabilities) educated in the inclusive classroom is the assignment of paraprofessionals (Downing, Ryndak, & Clark, 2000; Giangreco, Broer, & Edelman, 1999; Marks, Schrader, & Levine, 1999). The number of paraprofessionals currently working in special education across the country has increased substantially over the past decade (Giangreco, Edelman, Broer, & Doyle, 2001; Katsiyannis, Hodge, & Lanford, 2000; Pickett, Likins, & Wallace, 2003). The use of paraprofessionals began primarily in response to teacher shortages, parent advocacy efforts, and increases in the number of included students (Pickett et al., 2003). In addition, districts have recognized the financial benefits of hiring "pseudoprofessionals" as well as the advantages of having cultural and linguistic liaisons (French, 2004; Pickett et al., 2003).

Although support for children with disabilities and other challenges is generally welcomed and considered beneficial to both the child and the classroom teacher, paraprofessionals fundamentally are underprepared, underpaid, and underappreciated (Hilton & Gerlach, 1997; Katsiyannis et al., 2000). Consequently, some question the apparent reliance on these individuals. Several researchers have raised specific concerns regarding paraprofessionals' roles, responsibilities, behavior, and impact (French, 2004; Giangreco et al., 2001; Marks et al., 1999; Pickett et al., 2003). In looking at roles and responsibilities, Marks et al. (1999), along with others (e.g., Downing et al., 2000; Giangreco et al., 2001), have found that paraprofessionals assume the majority of the responsibility over the instructional (e.g., planning, delivering, accommodating) and behavioral (e.g., management) needs of an included student, despite the fact that IDEA mandates that certified teachers maintain primary responsibility (Etscheidt, 2005; Katsiyannis et al., 2000). In looking at the behaviors and subsequent impact of paraprofessional support, researchers have found that untrained paraprofessionals are generally either over- or underuninvolved. Studies have shown that paraprofessionals tend to exhibit "hovering" behaviors that limit student interaction with peers and teachers and increase adult dependency (Giangreco, Edelman, Luiselli, & MacFarland, 1997; Giangreco, Broer, & Edelman, 2001; Harper & McCluskey, 2003). Other studies (Young, Simpson, Myles, & Kamps, 1997) have found that paraprofessionals fail to initiate any interactions toward the student with autism. In either case, it seems that paraprofessionals need specific training to positively impact the educational progress of the children they serve (Fox, 1999).

Giangreco and colleagues (Giangreco et al., 1999, 2001) noted the increasing reliance on paraprofessionals and cautioned against having the least-qualified people responsible for the most challenging students. This reliance is problematic on multiple levels (e.g., educational, occupational, and legal). Thus, the authors called for guidelines in determining the need for an assigned paraprofessional, clear role descriptions, training and support in the service they provide, and systematic data on their impact. Furthermore, while acknowledging and appreciating the efforts that paraprofessionals put forth and the benefits that many children have experienced as a result, the authors suggested that the current service delivery model be more closely examined as there are limited data on student outcomes related to the direct and indirect support of paraprofessionals (Giangreco et al., 2001).

RESEARCH TO PRACTICE: UNDERSTANDING "THE GAP"

Researchers and practitioners alike have recognized the significant gap that exists between that which is published in the literature and that which schools actually carry out (Brown et al., 2001; King-Sears, 2001; Snell, 2003). A variety of barriers contributing to this phenomenon have been identified, including inadequate preservice preparation and training, a lack of ongoing support, time constraints, teacher efficacy, and teachers' perceived importance and feasibility ratings of techniques (Morin, 2001; Reinoehl & Halle, 1994). Although researchers have discussed this gap at length and offer explanations for why and how it occurs, there are no simple or definite answers regarding what to do about it. Key themes of school-related issues and challenges that contribute to the research-to-practice gap related to delivering a successful education program for students with autism within the inclusive classroom include staff training (as described here), goodness of fit, and the replication of research-based inclusion programs.

Current research on instruction in general shows that teachers and paraprofessionals implement both research-based and non-researched-based instructional strategies (Hemmeter, 2000; Howard, Sparkman, Cohen, Green & Stanislaw, 2005; Kohler, Ezell, & Paluselli, 1999; Stahmer, Collings, & Palinkas, 2005) but rarely provide social intervention, particularly peer-mediated social instruction (Brown et al., 2001; Gelzheiser et al., 1998; Kohler et al., 1999). With respect to autism, Lerman, Vorndarn, Addison, and Kohn (2004) pointed out that few teachers are given any formal instruction in empirically based techniques specific to educating children with autism either academically or socially. This is in spite of the rapid increase in incidence rates and the growing requests by parents, professionals, and advocates that such techniques be employed. As a result of this paucity of training, parents and other team members often find themselves in a dilemma when making placement decisions. That is, parents may have to choose between various components of successfully documented models (e.g., participation in inclusive activities vs. effective instruction via trained staff) rather than implementing

a complete and comprehensive package (Bricker, 2000; Kohler & Strain, 1999; Schwartz, Sandall, McBride, Boulware, 2004).

Eichinger and Downing (2000) contended that current teacher certification programs are outdated and inappropriate as they continue to prepare educators for segregated environments instead of inclusive classrooms. Furthermore, attitudes favoring segregated education have been found among preservice teachers, perhaps indicating that university preparation programs are failing to teach proinclusion pedagogy (Rainforth, 2000). To address these problems, Eichinger and Downing (2000) recommended restructuring the certification process by aligning the preparation programs of general and special education preservice teachers, providing collaboration training, and offering advanced specialization within special education. Other recommendations include offering university-based professional development summer programs (Lerman et al., 2004); increasing field experiences in quality inclusive classrooms (Wigle & Wilcox, 1996); modeling team teaching in university courses (Eichinger & Downing, 2000); emphasizing creative thinking, innovation, empowerment, and motivation (Rainforth, 2000); and establishing university-district partnership programs as a model for teacher education (Sindelar, Daunic, & Rennells, 2004).

In addition to reevaluating current certification programs, researchers have investigated ways to effectively and efficiently train teachers already in the classroom. For example, Kohler and colleagues (Kohler, Anthony, Steighner, & Hoyson, 2001; Kohler et al., 1999; Kohler & Strain, 1999; Kohler, Strain, Hoyson, & Jamieson, 1997) impressively produced changes in the teaching behaviors of kindergarten general education teachers, early childhood teachers, and paraprofessionals via training techniques such as peer coaching (i.e., teacher to teacher), daily and weekly feedback, and technical assistance. These techniques, particularly the technical assistance (e.g., on-the-spot suggestions) strategies, were successful in improving teachers' skills in social facilitation, activity adaptation, and the implementation of peer-based instruction of IEP goals. Subsequently, their students with disabilities experienced increases in social interaction, greater engagement in teaching episodes, and progress toward IEP goals. Similarly, Schepis and colleagues (Schepis, Ownbey, Parsons, & Reid, 2000; Schepis, Reid, Ownbey, & Clary, 2003) successfully trained preschool staff to teach adaptive and cooperative participation skills by way of on-the-job feedback, verbal/written/video instructions, and role-playing techniques. Moreover, the training was conducted in approximately 7 hr, demonstrating the plausibility of brief, yet effective, training programs.

Although numerous teacher training tools are available for use, in vivo performance feedback appears to be a highly effective training, and most likely essential, component (Kohler et al., 2001; Schepis et al., 2000). Unfortunately, traditional teacher training methods primarily include didactic instruction and in-service workshops despite the evidence that these training methods are insufficient by themselves. Instead, it is recommended that training programs take place in the natural environment (i.e., in vivo feedback within classroom routines); consist of feasible, embedded

strategies; and include teacher collaboration and problem solving as well as adequate social and administrative support to ensure sustainability (Snell & Janney, 2000).

In addition to teacher and preschool staff training, researchers have also examined paraprofessional training. Katsiyannis et al. (2000) noted that most paraprofessionals begin their jobs with no formal training and continue to work with limited knowledge, skill, and support. Subsequently, parents, teachers, researchers, policy makers, and the paraprofessionals themselves have called for a working training model (Giangreco et al., 2001; Katsiyannis et al., 2000; Marks et al., 1999; Pickett et al., 2003; Riggs & Mueller, 2001). Given that families and school systems appear to be relying on paraprofessionals to provide students with disabilities a socially beneficial inclusive education, it is ever more critical that these team members be successfully trained to implement empirically based strategies that foster development.

Clearly, there is a need for general and special education teachers to have preservice training on training others (such as paraprofessionals) to implement social and inclusion programs, among other skills pertaining to the education of students with autism (Etscheidt, 2005; French, 1998, 2001; Katsiyannis et al., 2000; Pickett, et al., 2003). Hilton and Gerlach (1997) outlined recommendations for the employment of paraprofessionals, as presented in position statements by the Teacher Education Division of the Council for Exceptional Children (CEC) and the Board of Directors of the Division on Mental Retardation and Developmental Disabilities (MRDD). These recommendations include clear role distinctions and job descriptions; effective, systematic strategies for training and supervision; guidelines for legal and ethical responsibilities; professional development and career advancement opportunities; and the preparation of teachers as supervisors (Hilton & Gerlach, 1997).

GOODNESS OF FIT

Variables other than teachers' training, preparation, and ability level also can affect the delivery of effective treatments within the classroom. In fact, researchers have documented a wide variety of contextual factors that can contribute to the lack of consistent implementation of intervention, including time constraints, acceptability and feasibility ratings of techniques, teacher efficacy, and transactional variables related to child and teacher characteristics and contextual variables such as structure, values, and resources (Odom, McConnell, & Chandler, 1994). As a result, the field has acknowledged the importance of good contextual fit. Contextual fit indicates the match or compatibility between the interventions itself and the implementers or related environments (Albin et al., 1996; Snell, 2003). For the implementation to be delivered consistently and with a high degree of fidelity, the intervention agents must perceive the plan to be important, useful, acceptable, and feasible (Odom et al., 1994; Snell, 2003; Stormont, Lewis, & Smith, 2005). Odom et al. (1994) found that teachers' use of classroom-based social intervention procedures were more associated with perceived feasibility than acceptability.

Likewise, Stormont et al. (2005) found that teachers rated the same behavioral support strategies as significantly more "important" than "feasible." Given that effectiveness may be sacrificed when interventions are implemented inconsistently or with poor precision, these findings emphasize the value of providing schools with strategies that are not only effective but also practical. For that reason, Detrich (1999) recommended that proposed interventions, in addition to being appropriate and effective for the child, match the values and skills of the implementers, maintain some overlap with current practices and previous training experience, and be supported within the available resources to the greatest extent possible.

TRAINING: REPLICATING SUCCESSFUL PROGRAMS

It appears that concerns over maintenance and generalization present in treatments for children are also present in treatments for systems. The majority of researched inclusion programs, and many intervention procedures, have been university-based models with highly trained personnel, relatively low student-teacher ratios, and a high percentage of students with disabilities per class (Brown, Odom, Li, & Zercher, 1999; Horn et al., 2000). In contrast, most inclusive community-based and public school programs across the country are comprised of high student-to-teacher ratios, few children with disabilities per class, untrained staff, and limited resources (Brown et al., 1999; Wolery & Gast, 2000). Consequently, even though valuable techniques for improving the social deficits of children with autism in the inclusive setting are outlined in the literature, further research is needed to demonstrate successful implementation within community-based and public school inclusive classrooms (i.e., external validity) and subsequent long-term outcomes. Moreover, success needs to be demonstrated across grade levels and functioning levels using existing teaching staff and available resources.

One large-scale community replication approach that easily could be replicated in educational settings involves a "train-the-trainers" model. Bryson, Koegel, Koegel, Openden, Smith, and Nefdt (2007) disseminated PRT in the context of parent education throughout the province of Nova Scotia. Groups of professionals and parents of children with autism participated in several week-long workshops. During these workshops, participants were provided with classroom work along with feedback on tapes they brought to the daily sessions of themselves working with a child with autism each previous afternoon or evening. Following the week-long workshops, participants mailed a series of videotapes to the United States for additional feedback. Trainers were also given instruction and feedback on their feedback to parents as well as their training of community-based clinicians. The project was successful in training trainers to implement in-home programs on a large-scale basis with a relatively short amount of training time. Results demonstrated improvements in the implementation of intervention by trainers and their trainees. As well, improvements were evidenced in child behaviors following the training. Further, there was very high consumer satisfaction with the training courses. Such programs

provide immediate dissemination of the latest university-researched interventions to geographically remote areas and serve as possible models for other school and community-based programs.

Further, focusing on the system as the unit of analysis, King-Sears (2001) pointed out the difficulties in institutionalizing effective interventions within schools and suggested that researchers collaborate with practitioners, receive feedback from staff, and conduct investigations within the natural, "realistic" environment. In agreement, White (2002) suggested that the value of research outcomes should be determined by those to whom the research is directed. Participatory action research (PAR) is a method of research that attempts to accomplish this end (Meline & Paradiso, 2003). More specifically, PAR offers a framework involving the collaboration between researchers and consumers that provides an avenue for researchers to gain a first-hand understanding of the existing issues, including training and support, goodness of fit, as well as variables related to both internal and external validity. The goal of this process is to empower consumers and, ultimately, to produce effective, acceptable, and sustainable changes (i.e., solutions) (Balcazar, Keys, Kaplan, & Suarez-Balcazar, 1998; Ho, 2002; Hughes, 2003; Rogers & Palmer-Erbs, 1994; Ward & Trigler, 2001). Overall, PAR appears to be a promising approach in the efforts toward closing the research-to-practice gap.

Specific to the student population with ASD, several models and demonstration programs have achieved successful outcomes and have consequently been presented in the National Research Council's (2001) report on comprehensive programs for children with autism. These demonstrations include UCLA's Young Autism Project (Lovaas, 1987; McEachin, Smith, & Lovass, 1993); LEAP (Kohler, Strain, & Shearer, 1996; Strain, 1987; Strain & Hoyson, 2000), the Walden Preschool (McGee, Morrier, & Daly, 2001); the Denver model (Rogers, Hall, Osaki, Reaven, & Herbison, 2001); the Douglas Developmental Disabilities Center (Harris, Handleman, Arnold, & Gordon, 2001); pivotal response training (Koegel & Koegel, 2006); the Children's Unit at the State University of New York at Binghamton (Romanczyk, Lockshin, & Matey, 2000); developmental intervention model at the George Washington University School of Medicine (Greenspan & Wieder, 1999); TEACCH (Scholpler, Mesibov, & Hearsey, 1995); and individualized support program (Dunlap & Fox, 1996).

Various other new and promising models also have attempted to provide children with autism a comprehensive university-based model for intervention. For example, a school-based, inclusive education model is Project DATA (Developmentally Appropriate Treatment for Autism; Schwartz et al., 2004). This model, aiming to provide effective, acceptable, and sustainable services, consists of high-quality inclusive best practices; extended, intensive instruction; family and transition support; and collaborative services (Schwartz et al., 2004). The data on child outcomes and consumer satisfaction are convincing; further, the developers have provided training in over 35 school districts (Schwartz et al., 2004), suggesting a high likelihood that the model will prove to be replicable in scientific research.

Overall, however, it appears that there is a continued need for effective dissemination (i.e., the distribution of knowledge, buy-in, and support and the assistance for replication and sustained use; Paine, Bellamy, & Wilcox, 1984). Specific to children with autism, some programs have met the criteria to be considered a model; however, some models either do not address the social deficits or do not have documented effective, wide-scale dissemination. This is important as effective dissemination to close the gaps in serving children with autism within school and community settings is critical.

CONCLUSIONS

Children with ASD require effective, intensive, comprehensive positive programming, and it is the responsibility of the school system, community, families, and the research community to ensure that these children receive the socially beneficial and meaningful education they need and deserve. Developing a comprehensive intervention package requires accurate evaluations. Because children with autism often have behavior problems that interfere with accurate measurement on standardized testing (L. K. Koegel, Koegel, & Smith, 1997), a variety of observations as well as coordinating with parents and other individuals who have interacted with the child in natural settings is important. Once goals are developed based on accurate evaluations, well-researched, scientifically sound intervention procedures can be implemented. We have stressed the importance of RTI and constant monitoring once an intervention program is in place. There is considerable heterogeneity in the diagnosis of autism, and procedures need to be adapted or changed if a child is not responding to an intervention. Often, children need a variety of programs, implemented simultaneously, to be effective (Carr, 2007). This chapter also discussed the importance of well-trained staff. Inexperienced or untrained staff and paraprofessionals often inadvertently are overinvolved or uninvolved. Lack of staff training can interfere with important interventions. Finally, the importance of coordinating goals and working as a team cannot be underemphasized. Although exasperated parents often resort to lawsuits, such actions are stressful for all involved. Comprehensive, multicomponent, scientifically sound interventions conducted in a coordinated fashion across home, school, and community settings, with well-trained staff offer the child with autism the best possible outcome.

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