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Children with autism can benefit from participation in inclusive classroom environments, and many experts assert that inclusion is a civil right and is responsible for nurturing appropriate social development. However, most children with autism require specialized supports to experience success in these educational contexts. This article provides a review of the empirical research that has addressed procedures for promoting successful inclusion of students with autism. Strategies reviewed include antecedent manipulations, delayed contingencies, self-management, peer-mediated interventions, and other approaches that have been demonstrated in the literature to be useful. The article concludes with a discussion of future research needs.

Including Children With Autism in General Education Classrooms

A Review of Effective Strategies

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The educational inclusion of students with autism and other disabilities has been a fiercely controversial topic (Harrower, 1999; Kauffman & Hallahan, 1995). Historically, students with disabilities have been segregated from their peers, even from society as a whole (Karagiannis, Stainback, & Stainback, 1996). More recently, however, there has been an increasing trend to include students with autism and other disabilities in general education classrooms along with their typically developing peers (McDonnell, 1998). This trend has stemmed largely from theoretical arguments related to social development and legal issues related to the civil rights movement (for a review, see Harrower, 1999).

The purpose of this article is to provide a review of data-based strategies for facilitating the educational inclusion of students with autism. First, research on inclusion as an independent variable will be briefly

reviewed with respect to social and academic outcomes. Second, intervention strategies that have been documented as successful in the process of including students with autism in general education classrooms will be presented. The intervention strategies that will be reviewed in this section include antecedent procedures, delayed contingencies, self-management strategies, peer-mediated interventions, and multicomponent strategies. We will also cover some empirically validated strategies that are not necessarily designed for use in inclusive settings but that may be very useful in some contexts. Last, a brief discussion of worthwhile areas for future research efforts in facilitating the inclusion of students with autism will be presented.

RESEARCH ON INCLUSION AS AN INDEPENDENT VARIABLE

One of the contributing factors in the controversy over inclusion has been the limited number of studies that have focused directly on procedures for facilitating educational inclusion (Hunt & Goetz, 1997). Before considering effective strategies, however, it is reasonable to question the extent to which inclusion results in the benefits that its proponents anticipate. The little research available that considers inclusion as an independent variable has documented generally, though not exclusively, positive results. This area of research has focused on both the social and the academic outcomes based on educational placement of children with autism.

With regard to the potential social outcomes of students with autism schooled in general versus special education settings, researchers have evaluated students with autism on a number of dependent variables, holding educational placement as the independent variable. For example, researchers have documented that students with disabilities, including students with autism, who are fully included (a) display higher levels of engagement and social interaction, (b) give and receive higher levels of social support, (c) have larger friendship networks, and (d) have developmentally more advanced individualized education plan goals than their counterparts in segregated placements (Fryxell & Kennedy, 1995; Hunt, Farron-Davis, Beckstead, Curtis, & Goetz, 1994).

Yet researchers have also found mixed results among students with autism in general education classrooms. For example, researchers have found that some fully included students with disabilities, including autism, are rated by their classmates as being among the most popular in class, whereas others are not (Evans, Salisbury, Palombaro, Berryman, & Hollowood, 1992). The study by Evans and colleagues (1992) also documented that students with disabilities were observed more frequently to be on the receiving, rather than the giving, end of social interactions, and this tendency was amplified over the course of the school year. Thus, studies addressing social behavior have yielded encouraging yet variable results (Evans et al., 1992; Hunt et al., 1994).

Relatively few studies have been conducted evaluating academic outcomes for students with autism as a result of educational placement (Hunt & Goetz, 1997). In one such study, Harris, Handleman, Kristoff, Bass, and Gordon (1990) compared five children with autism enrolled in a segregated preschool classroom, five children with autism in an inclusive classroom, and four typically developing peers in the inclusive classroom on measures of language ability before and after language instruction. Results failed to show significant differences in language ability between the children with autism in either setting (Harris et al., 1990). These types of findings have generally been interpreted as supporting educational inclusion, as segregated educational placements have historically been purported to provide more intensive educational opportunities for students with disabilities (Harrower, 1999).

Authors often note that the mere placement or proximity to typical peers and the general education curriculum may be beneficial, but it is insufficient in achieving an appropriate education for students with disabilities (e.g., Hunt & Goetz, 1997; Kohler, Strain, & Shearer, 1996). For this reason, many researchers have advocated for educational inclusion as a reallocation of specialized educational services, not merely as an intervention in and of itself (Sailor, 1996). Thus, the focus of the inclusion debate may best be reframed from segregated versus inclusive education to how to provide appropriate supports in inclusive settings. For inclusive placements to be successful, educators must have knowledge of and access to empirically validated strategies that will assist them in this process. Therefore, the following dis-

discussion provides a review of intervention strategies that have been documented as effective in supporting students with autism in inclusive educational contexts.

REVIEW OF STRATEGIES FOR FACILITATING THE INCLUSION OF STUDENTS WITH AUTISM

Prior to beginning a discussion of strategies for promoting inclusion, a few important considerations are warranted. As has been widely noted, autism is a highly heterogeneous disability with regard to level of functioning (G. Dunlap & Bunton-Pierce, 1999; Gillberg, 1999; Koegel, Valdez-Menchaca, Koegel, & Harrower, 2001). Thus, the level and intensity of supports required for a given student with autism will depend largely on the characteristics of the student's functioning. It would be beyond the scope of this review (and the status of the literature) to delineate specific strategies that are more or less appropriate for varying levels of functioning. In addition, much of the research on inclusion of students with autism has been conducted with young children. There is a lack of pertinent research on including students with autism at the middle school and high school levels. Again, it is not the purpose of this article to prescribe intervention strategies based on age or grade level. The purpose is to provide a review of documented strategies that can then be individually tailored to meet the idiosyncratic needs of particular students with autism participating in inclusive educational placements.

ANTECEDENT PROCEDURES

By modifying discriminative stimuli for both appropriate and inappropriate behavior, antecedent procedures can be designed to prevent and reduce challenging behavior. One very positive aspect of antecedent procedures is that they are proactive. Since these strategies all involve altering routines or environments, they address challenging behavior prior to its occurrence. Antecedent procedures that have been used specifically for students with autism in general education classrooms include priming, prompt delivery, and picture scheduling.

Priming. Priming, or prepractice, has been documented as an effective classroom intervention for children with autism. Priming consists of previewing information or activities that a child is likely to have difficulties with before the child actually engages in that activity (Wilde, Koegel, & Koegel, 1992). For example, if a child is having difficulties during circle activities where the teacher is reading the class a story, each day's story could be read to the child individually before the child experiences the story in the presence of the entire class. Priming is important in facilitating the inclusion of students with autism in that it links individual instruction to larger classroom group activities, a common feature of general education classrooms. Research has focused on using priming to improve social interactions between children with autism in regular education classrooms, and priming has been shown to be effective in increasing the initiations of social interaction with typical peers (Zanolli, Daggett, & Adams, 1996).

Prompt delivery. Prompting strategies have been successful in facilitating the inclusion of students with autism. Often, when teaching children with autism, in order to elicit an appropriate response in a targeted academic or behavioral activity, one must provide prompts that supplement the general instructional routine. Using various prompting strategies is important in facilitating the inclusion of students with autism, as these students may not respond to traditional instructions delivered in general education classrooms. For example, Sainato, Strain, Lefebvre, and Rapp (1987) compared the effectiveness of two prompting strategies for facilitating school transition times with three preschool boys with autism. In the peer buddy condition, the classroom teacher provided prompts and modeling to a typically developing student, who then provided prompts to the student with autism. The classroom teacher did not deliver prompts to the children with autism. In the antecedent condition, the classroom teacher alone provided prompts to the students with autism, instructing the peer buddies not to assist. Both conditions yielded increases in appropriate behaviors, with the teacher-only condition revealing superior results in all transition settings. Both conditions also resulted in significant reductions in teacher prompts over time, suggesting that the students began to make transitions independently.

Other types of prompting strategies have also been documented to improve outcomes for students with autism in inclusive classrooms. For example, Taylor and Levin (1998) examined the effects of a tactile prompting device for increasing the verbal initiations of a 9-year old student with autism. The device, carried in the student's pocket, made a slight vibration at prespecified time intervals, and this served as a prompt for the student to make a verbal initiation regarding his play activities. Increases in verbal initiations were observed not only toward an adult in a variety of play contexts but also during follow-up probes conducted during cooperative learning activities with typically developing peers in the student's general education classroom.

Picture schedules. Picture schedules are often used as a strategy for increasing predictability and as an alternative to verbal and written instruction. Transitioning from one activity to another can be problematic for some students with autism yet is a very common occurrence in general education classrooms. Picture schedules can serve as effective cues alerting students with autism to upcoming changes in activities. For example, Hall, McClannahan, and Krantz (1995) used a picture book schedule describing the daily general education classroom activities for three students with disabilities, including one with autism. Results demonstrated that, along with reductions in prompt use by classroom aides, the students followed their activity schedules 90% to 100% of the time. Furthermore, these strategies received high ratings of social validity in that the aides indicated that they would use the strategies with other students and would recommend their use to other aides.

DELAYED CONTINGENCIES

One goal of education is to increase the independent academic functioning of students. This has often been a daunting goal for educators working with students with autism. While successes have been well documented for students with autism under conditions of close adult supervision, there has also been evidence that the removal of supervision often leads quickly to a reappearance of challenging behavior and/or a decrease in appropriate behavior (Marholin &

Steinman, 1977; Stahmer & Schreibman, 1992). This failure of behavioral gains to generalize has been linked to the removal of contingencies (e.g., positive reinforcement) that typically accompany the removal of supervision. Thus, some researchers have examined the extent to which instruction using delayed or unpredictable contingencies can facilitate the generalization of behavior in the absence of direct supervision (G. Dunlap & Johnson, 1985; G. Dunlap, Koegel, Johnson & O'Neill, 1987). For example, G. Dunlap and Johnson (1985) used an unpredictable schedule of supervision with three children with autism and found that levels of on-task behavior and productivity were significantly higher during periods of no supervision than when a predictable schedule of supervision was in place.

Delayed and unpredictable contingencies were used by G. Dunlap, Plienis, and Williams (1987) to establish fully independent task completion by a young man with autism and profound intellectual disabilities after a gradual process of thinning reinforcement schedules and delaying the delivery of corrective feedback. These procedures were also used by G. Dunlap, Koegel, et al. (1987) to establish appropriate responding in inclusive educational settings for two boys with autism and one young man with autism in an integrated work setting. In these three instances, the participants' appropriate behavior was successfully maintained over extended periods of time without the need for close supervisory attention.

SELF-MANAGEMENT STRATEGIES

Self-management has been described as a viable intervention strategy for promoting independence in the classroom, as it shifts some responsibility for behavior management from the teacher to the student (L. K. Dunlap, Dunlap, Koegel, & Koegel, 1991), increasing a teacher's ability to focus on instruction. Self-management consists of teaching the student to (a) discriminate between appropriate and inappropriate behaviors, (b) evaluate her or his own behavior, (c) monitor her or his behavior over time, and (d) reinforce her or his behavior when prespecified criteria are met. Not only has self-management been documented to be an effective strategy for a variety of target behaviors, but research has also shown that teaching a child to self-

manage behavior in the classroom can result in independent functioning to the point where the student is no longer relying on the teacher or on a one-on-one aide (Koegel, Harrower, & Koegel, 1999). As a result of this decreased dependency on adult intervention, the student has increased opportunity to interact with classmates without the potential stigma of having a one-on-one aide. Thus, self-management allows students with disabilities to become actively involved in the intervention process and more involved in their classroom environments. For these reasons, self-management has been suggested in the literature as an ideal intervention for children with disabilities participating in full inclusion classroom settings (Reid, 1996).

Although documentation of the use of this intervention with students with autism and other disabilities participating in inclusive classrooms has been scarce (Reid, 1996), the studies that have implemented self-management interventions for students with autism in these settings have reported encouraging results. For example, self-management has been successfully utilized for improving social skills and reducing disruptive behavior (Koegel, Koegel, Hurley, & Frea, 1992), increasing independent work skills (Sainato, Strain, Lefebvre, & Rapp, 1990), and improving the social interactions of children with autism participating in integrated academic settings (Strain, Kohler, Storey, & Danko, 1994). In particular, Koegel et al. (1992) used self-management to improve the responsiveness of four children with autism to verbal initiations from others in community, home, and school settings without the presence of a treatment provider. The children were taught to use a wrist counter to record their correct responses to questions, which were then rewarded. The results demonstrated improvements in these students' independent responsiveness to others, along with concomitant reductions in disruptive behavior.

In another study, Sainato et al. (1990) evaluated the effects of a self-management intervention package on the independent work skills of children with autism participating in an integrated preschool classroom. Results of this study showed immediate and substantial improvements in the students' behavior and also showed that these gains were maintained after each intervention component was systematically withdrawn. Similarly, Strain et al. (1994) examined the effects

of a self-management intervention package on the social interactions of three preschool boys with autism. This intervention consisted of adult prompts, reinforcement, and self-monitoring and was implemented in the inclusive classroom setting and extended to the home setting for two of the three students. Results indicated that the intervention increased and improved each boy's social interactions with siblings and typically developing classmates. In addition, Callahan and Rademacher (1999) used a self-management strategy to increase rates of on-task behavior for a second-grade boy with autism participating in a full inclusion classroom. Although most of the literature on self-management and children with autism has focused on verbal children, Pierce and Schreibman (1994) taught daily living skills to three nonverbal boys with autism via pictorial self-management.

The combination of self-management strategies with functional assessment in supporting students with autism in full inclusion settings is a potential area for future research. In an initial demonstration of this approach, Frea and Hughes (1997) conducted functional analyses for two high school students with mental retardation in order to determine the function of the students' problem behaviors. Once the function was determined, a response that was functionally equivalent to the problem behavior (e.g., request a break, request for attention) was targeted for each student in a self-management intervention package. The results demonstrated increases in the use of the alternative behaviors with concomitant decreases in problem behavior (Frea & Hughes, 1997). This combination of methodologies has been used to teach students with disabilities in inclusive educational settings to self-manage their use of functionally equivalent responses, resulting in more functional reinforcement (Frea & Hughes, 1997; Todd, Horner, & Sugai, 1999).

PEER-MEDIATED INTERVENTIONS

Due to common deficiencies in the social relationships of children with autism, peer-mediated interventions have been advocated as potentially useful approaches for facilitating the participation of children with autism in general education classrooms. Utilizing typical

peers to support the academic functioning of students with autism has the potential to reduce the need for continuous one-on-one adult attention, thus allowing students with autism to function with increased autonomy and in a manner that more closely matches that of their typical classmates (Putnam, 1993).

Peer tutoring. Peer tutoring consists of pairing two students together to work on any instructional strategy, with one student providing assistance, instruction, and feedback to the other (DuPaul & Eckert, 1998). Peer tutoring strategies have been shown to be effective in producing increases in on-task behavior, math performance, and social interactions for children with disabilities in inclusive classrooms (DuPaul & Henningson, 1993; Locke & Fuchs, 1995). In classwide peer tutoring (CWPT), all children in the class are paired and work simultaneously. The purpose of CWPT is to increase the amount of instructional time that all students engage in academics and to provide pacing, feedback, immediate error correction, high mastery levels, and content coverage (Fuchs, Fuchs, Mathes, & Simmons, 1997).

In a study examining the effects of CWPT in reading instruction among three students with autism participating in regular education classrooms, results of reading assessments revealed gains in reading fluency and correct responses to reading comprehension questions (Kamps, Barbeta, Leonard, & Delquadri, 1994). Furthermore, in unstructured free-time activities, increases in the duration of social interactions between the students with autism and their nondisabled peers were observed after the implementation of CWPT (Kamps et al., 1994). However, there is some evidence suggesting that increasing the rate of social interaction among children with disabilities by implementing CWPT programs may be insufficient in producing enduring changes across unprogrammed settings (Hundert & Houghton, 1992). Thus, even though this strategy appears ideal for use in inclusive classroom settings, more research is needed to assess the generality of findings as well as to verify the effects on social and academic achievement among children of different ages with different needs in general education classrooms.

Utilizing peer supports. A number of researchers have focused on recruiting typically developing students to serve as peer supports for students with autism (Haring & Breen, 1992; Odom & Strain, 1986). The goal of this strategy is similar to that of peer tutoring but with the focus being on improving the social interaction skills of students with autism. Odom, Hoyson, Jamieson, and Strain (1985) evaluated the effects of peer initiations on the social interactions of preschoolers with autistic-like symptoms. Teachers prompted and reinforced social initiations made by identified peer supports. Results showed increased frequencies of positive social interaction, and although these results maintained when the teachers faded their reinforcement of peer-initiated interactions, there were decreases in interactions when teacher prompts were withdrawn. Furthermore, the results were not observed to generalize to other classroom settings.

In another study, Odom and Strain (1986) found that when typical children initiated contact with their peers with autism, social responses by the students with autism increased, and that when teachers prompted the social interactions, both social responses and initiations increased. These findings suggest the potential of multicomponent intervention strategies in producing improvements in a variety of behaviors among students with autism in inclusive classrooms (Odom & Strain, 1986).

In some circumstances, simply training nondisabled peers to interact with classmates with autism has been shown to improve spontaneous social interactions between students with autism and their trained and untrained peers (Brady, Shores, McEvoy, Ellis, & Fox, 1987). In addition, Goldstein, Kaczmarek, Pennington, and Shafer (1992) found that simply having peers attend to, comment on, and acknowledge the behavior of their classmates with autism resulted in improved rates of social interaction. Haring and Breen (1992) involved nondisabled peers in weekly discussions with an adult integration facilitator to increase opportunities for social interaction for two 13-year old students, one with autism and one with mental retardation. The nondisabled peers participated in the implementation of social skills interventions and used self-monitoring strategies to record the quantity and quality of interactions with classmates with disabilities. Results of this study revealed increases in the frequency of interac-

tions, number of opportunities for interactions, and overall appropriateness of the interactions with their peers with disabilities.

Cooperative learning. A number of studies have demonstrated that teaching social and academic skills to children with autism and their nonhandicapped peers in cooperative groups in integrated settings results in increased frequency, duration, and quality of social interactions (Kamps et al., 1992; Kohler et al., 1995). Cooperative learning groups have been used in inclusive classroom settings as an instructional activity for increasing both academic success and social interaction (see Putnam, 1993).

In one such study, Dugan et al. (1995) evaluated cooperative learning groups during fourth-grade social studies activities, where the group activities consisted of tutoring on key words and facts, a team activity, and a whole class wrap-up and review. This resulted in improvements in test scores and academic engagement and increased duration of student interaction between children with autism and their nondisabled classmates. Similarly, Hunt, Staub, Alwell, and Goetz (1994) used cooperative learning groups to support three fully included second-grade students with multiple severe disabilities, including one with autism and an intellectual disability. Results showed that with gradually fading assistance from the teacher, the nondisabled members of the learning groups provided cues, prompts, and consequences that assisted the students with disabilities in demonstrating targeted basic skills in the original cooperative learning group as well as in a newly formed group. Furthermore, achievement tests indicated that the nondisabled students who participated in cooperative groups performed as well as members of groups that did not include a student with a disability. In addition, Kamps, Leonard, Potucek, and Garrison-Harrell (1995) conducted two experiments related to cooperative learning groups and their academic effects on including students with autism in general education classrooms. In both, cooperative learning groups were implemented and consisted of activities that included comprehension questions, academic games, and peer tutoring on vocabulary words. Results of both experiments in this study revealed increased reading gains, academic engagement, and peer interaction among students with autism and their peers par-

ticipating in general education classrooms. Researchers have also used sociodramatic scripts during social routines for various play activities between students with autism and their typical peers and found increases in theme-related social behaviors, even when new scripts were introduced and the play groups were rearranged (Goldstein & Cisar, 1992).

Many researchers have used cooperative groups specifically for improving the social skills of students with autism in inclusive classrooms. For example, Kamps et al. (1992) investigated the use of social skills groups to facilitate the increase of social interactions among three boys with autism who were integrated into a general education first-grade classroom. Group members were taught how to (a) initiate, respond, and keep interactions going; (b) greet others and converse on a variety of topics; (c) give and accept compliments; (d) take turns and share; (e) ask for help and help others; and (f) include others in activities. Results demonstrated increases in the frequency of, time engaged in, and duration of social interactions, as well as in the responsiveness of students and peers to each other (Kamps et al., 1992). Similarly, Kohler et al. (1995) used a group-oriented contingency to reinforce peers to share, provide assistance, and organize play exchanges with their preschool classmates with autism. Results revealed increases in these social and supportive interactions.

Peer-mediated interventions not only have been documented as effective in facilitating the educational inclusion of children with autism but have also been identified as having social validity. Research on the social validity of peer-mediated interventions has documented positive ratings made by typical peers regarding their perceptions of peer-mediated interventions (Kamps et al., 1998) and positive academic outcomes for typical students who participated in peer-mediated interventions (Cushing & Kennedy, 1997).

MULTICOMPONENT INTERVENTIONS

Some intervention strategies have made use of multiple research-based techniques to facilitate the educational inclusion of students with autism. Because multicomponent approaches may be more common in practice than single-component interventions, it is appropriate

to include an example in this review. Hunt, Alwell, Farron-Davis, and Goetz (1996) evaluated a comprehensive individualized intervention consisting of (a) ongoing information to classmates about various aspects of the disability experienced by the target student during naturally occurring interactions or in weekly “club” meetings, (b) various media used for communicative interactions, and (c) the establishment of a rotating buddy system. This multicomponent intervention was found to dramatically increase reciprocal interactions and target student-initiated interactions for students with significant physical and intellectual challenges and sensory impairments. These findings have been replicated for students within the autism spectrum participating in full inclusion classrooms (Hunt, Farron-Davis, Wrenn, Hirose-Hatae, & Goetz, 1997). Specifically, the multicomponent intervention used in this replication study consisted of the development and use of conversation books, rotating peer buddies, weekly class meetings, media-related activities, and staff prompting. Results demonstrated increases in exchanges with peers, with the focus students more frequently initiating the interactions and providing information, as compared to being the recipients of communication and assistance. Overall, interactions between the focus students and their peers were observed to closely approximate those between nondisabled students as a result of the intervention (Hunt et al., 1997).

ADDITIONAL STRATEGIES FOR FACILITATING THE INCLUSION OF STUDENTS WITH AUTISM

Although the strategies that will be discussed in this section have considerable empirical support documenting their effectiveness in teaching children with autism, they have not been specifically designed to support participation in inclusive classrooms. Rather, the strategies are effective teaching techniques that could be used when supporting a student with autism in a general education classroom. We include them in this review because they constitute well-researched strategies that can be used to improve the responding of students with autism and because the relevant research includes at least some extensions to inclusive educational contexts.

PRETASK SEQUENCING

High-probability (high-P) requesting has a long history of empirical support as an effective antecedent-based strategy for increasing responsiveness to requests among individuals with disabilities (Singer, Singer, & Horner, 1987). This antecedent procedure involves preceding a difficult request with a rapid series of short, easy requests and reinforcing compliance with these easy requests. By preceding a difficult task with a series of short and easy tasks that have a high probability of being followed, a child will achieve repeated success and build momentum for improved responding through obtaining repeated reinforcement (Mace et al., 1988; Singer et al., 1987). Although task interspersal procedures have typically focused on increasing compliance to adult-initiated directives, many researchers have suggested the utility of such interspersal procedures when incorporated into a variety of instructional techniques for a variety of target behaviors (Davis & Brady, 1993). For example, Davis, Brady, Williams, and Hamilton (1992) investigated the effects of high-P requests on the acquisition and generalization of responding to low-P requests among two boys with disabilities, including one with autism and mental retardation. Results demonstrated not only increases in appropriate responding to adult requests but generalized appropriate responding to low-P requests by adults not involved in the delivery of the high-P sequence. Davis, Brady, Hamilton, McEvoy, and Williams (1994) later replicated and extended these findings to include generalization of responsiveness to requests to initiate social interaction, along with increases in unprompted initiations and extended interactions with peers in inclusive settings.

PIVOTAL RESPONSE TRAINING AND NATURALISTIC TEACHING STRATEGIES

Incidental teaching approaches and pivotal response training (PRT), which focus on increasing motivation to learn among children with autism by incorporating choices, reinforcing attempts, using adequate modeling, and providing natural consequences, have also been used as strategies for facilitating the inclusion of children with autism in general education classrooms (McGee, Almeida, Sulzer-Azaroff, &

Feldman, 1992; Pierce & Schreibman, 1995, 1997; Thorp, Stahmer, & Schreibman, 1995). Both incidental teaching approaches and PRT focus on using conditions of natural language teaching interactions such that (a) stimulus items are functional and varied, (b) natural reinforcers are employed, (c) communicative attempts are reinforced, and (d) trials are conducted within a natural interchange (Koegel, Koegel, Harrower, & Carter, 1999; McGee, Morrier, & Daly, 1999). Yet, although incidental teaching approaches and PRT share these commonalities, PRT also focuses on targeting motivational variables, incorporating child choice, interspersing maintenance trials, increasing responsiveness to multiple cues, teaching self-management, and teaching self-initiations (see Koegel, Koegel, et al., 1999). Both incidental teaching and PRT have been used with peer-mediated strategies and documented as successful multicomponent intervention strategies that can be used for facilitating the inclusion of children with autism in general education classrooms.

An example was reported by McGee and her colleagues (1992), who used peer-delivered incidental teaching strategies to promote reciprocal social interactions between preschool students with autism and their typical peers. Peer tutors were identified and used incidental teaching to elicit verbal labels of preferred toys by students with autism. Adult assistance was successfully faded, with improvements in social interactions being maintained. In addition, teachers and peers in this inclusive preschool made positive ratings regarding the strategies and their effectiveness, supporting their social validity. Similarly, Pierce and Schreibman (1995) found that by utilizing typical peers to implement naturalistic teaching strategies (PRT) in the absence of direct supervision in a general education classroom environment, students with autism engaged in prolonged interactions, initiated play and conversations, increased engagement in language and joint attention behaviors, and displayed positive changes in social behaviors as reported by their teachers. Although these gains were documented to maintain over time and generalize to some unprogrammed settings, generalization did not tend to occur across untrained peers (Pierce & Schreibman, 1995). Generalization across untrained peers was achieved when multiple peers were involved in implementing the PRT strategies (Pierce & Schreibman, 1997). Teachers have also embed-

ded naturalistic language procedures within their classrooms to facilitate the inclusion of children with autism. For example, Smith and Camarata (1999) demonstrated that general education teachers could successfully implement naturalistic language procedures to improve intelligibility in language skills and spontaneous language use among students with autism.

FUTURE DIRECTIONS AND CONCLUSION

In one way or another, research on behavior analytic supports for students with autism in inclusive contexts has been in progress for nearly two decades. It is a very large and complex undertaking, and there are many questions to ask and problems to solve. None of the questions and none of the answers is simple.

As this review has shown, a number of studies have demonstrated encouraging findings for some children with autism in some inclusive classrooms. The studies have explored and implemented a diverse technology of behavior analysis, with interventions ranging from antecedent manipulations to delayed contingencies, peer-mediated strategies and programs of self-management. Together, these studies provide a rich source of intervention options, and it is likely that one or more of the options could be used to improve the responding of any child identified as being in need of systematic support.

Although the literature offers an encouraging research base, there is a great deal of applied study that needs to occur for us to advance the opportunities of students with autism in inclusive classroom environments. In general, it is important for researchers to look at the diversity of students with autism, including differences in intellectual and behavioral functioning and cultural and economic backgrounds (G. Dunlap & Kern, 1997). For instance, a growing number of students with Asperger's syndrome display unusual patterns of behavior (e.g., compulsive and perseverative responding) that constitute great challenges for educators, in spite of these students' other competencies. At the same time, there are students who have severe intellectual and/or behavioral disabilities, whose inclusion may require very extensive attention and partial participation. Research that distin-

guishes these students' support needs would be welcomed by the educational community (G. Dunlap & Fox, in press; Sailor, 1996).

There will continue to be a need for the detailed behavior analytic research of the kind that has been responsible for the progress to date. In particular, research should connect the technology of functional assessment with strategies for promoting inclusion (cf. Frea & Hughes, 1997), and it should examine team approaches for planning and implementing individualized behavior support plans (e.g., Kincaid, 1996; Nickels, 1996). It would be a significant contribution to have parametric analyses of the existing technology so that procedures could be matched to the settings, the resources, and the child and family circumstances.

Research is also needed at the systems level. Inclusion can only work well if the educational system (at the district, school building, and classroom levels) is designed to encourage and support its success. For instance, systems need to have workable strategies for delivering the ready availability of experts in autism and behavior analysis in inclusive classrooms, and the teachers responsible for implementing special strategies need to have adequate resources and social support, or they are likely to burn out and fail to address the need for systematic interventions.

Inclusion for children with autism is important because education and socialization for children with autism is important. It can be argued that our failures to produce quality inclusion for these students are tantamount to our failures to provide them with a quality education. Our successes possess an analogous equivalency. With a concerted focus on relevant research and a diligent approach to application, combined with a philosophical commitment to optimal and socially inclusive outcomes, we can anticipate further progress in our efforts to support students with autism in appropriate educational settings.

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