Autism:
Behavior-Analytic Perspectives

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Chapter 10

Strategies for Integration: Building Repertoires that Support Transitions to Public Schools

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A current theme in the education of young people with developmental disabilities is integration. Integration means that children with disabilities have the same experiences as typical youngsters. Such experiences may include enrollment in a regular preschool or school; participation in special events, such as birthday parties or trips to the shopping mall; and inviting peers to the home (Dunlap & Robbins, 1991). But for children with severe developmental disabilities, these activities may have little impact. A 1991 investigation of preschool integration (Cole, Mills, Dale, & Jenkins) found that students with more severe disabilities showed greater gains in segregated environments, and students with less severe disabilities made greater gains in integrated settings. Although imitation of typical peers is precluded in some segregated environments, there is presently little or no evidence that physical proximity of typical children and children with severe developmental disabilities results in progress for the latter.

The debate about segregated versus integrated educational settings has been clouded by the absence of sound measures of child progress. The standardized tests often used to assess the academic skills of typical children may be inappropriate for students with severe developmental disabilities (Kellegrew, 1995), and measures of progress in achieving IEP goals are frequently quite primitive. Clearly, observational measures of children's skill acquisition are immensely helpful in making future placement decisions, and we will return to this point later. But first, we will examine the characteristics of preschool children when they are first enrolled in the Princeton Child Development Institute, a specialized behavioral program for children with autism. Referred children are eligible for enrollment if they receive medical diagnoses of autism and meet the DSM-IV (APA, 1994) criteria for autism. They are not selected on the basis of IQ scores, verbal skills, or presenting repertoires.

All of the preschoolers seen during the past twenty-two years lived at home with one or both parents and, in most cases, with one or more typical siblings. They were members of families who experienced trips to parks, restaurants, and special events, as well as visits with friends, grandparents, and other relatives; thus, they were not deprived of the experiences that are important to the development of nonhandicapped

children. Nevertheless, at the outset of intervention, none of them imitated others or engaged in cooperative play with siblings or peers; none appropriately interacted with parents or grandparents; none participated in family activities in the absence of stereotypic or disruptive behavior; and indeed, none displayed systematic visual attending to parents, siblings, or other persons in their environments. Before they enrolled in the Princeton Child Development Institute, some attended integrated preschools, but either they made no progress, or they were excluded because teachers were unable to manage their atypical behavior. In co-education settings, these youngsters presented extraordinary challenges. Most were not toilet trained, had little or no receptive or expressive language, and engaged in high-rate stereotypies, such as vocal noise, hand-flapping, and rocking. Some were aggressive or self-injurious. Although they were included in integrated settings, the characteristics of autism segregated them from teachers, parents, siblings, and peers (McClannahan & Krantz, 1994). Their early histories, data on their skill acquisition in a specialized intervention program, and data on their later performance in public school classrooms lend support to the importance of a continuum of educational placements for children with severe disabilities.

Programming for Integration

Given the characteristics of young children with autism who enter the Princeton Child Development Institute's specialized program, a great deal must be accomplished in order to prepare them for co-education. This endeavor requires ongoing mentoring and regular evaluation of intervention agents' skills in behavioral assessment and intervention (McClannahan & Krantz, 1994). Precise measurement of child performance permits continuing evaluation of instruction; ineffective teaching strategies are revised or deleted and replaced with more productive intervention techniques that support children's progress.

Initially, children who have little or no receptive or expressive language, and who have not learned to attend to teachers or curriculum, benefit from one-to-one, discrete-trial instruction. Such training is typically necessary in order to diminish incompatible responses, and to shape critical skills such as sitting quietly, looking at relevant materials, and pointing when requested to do so (Etzel & LeBlanc, 1979), as well as to establish vocal- and motor-imitation repertoires (Young, Krantz, McClannahan, & Poulson, 1994). But when these competencies develop, it is important to modify instruction: to intersperse discrete-trial training in a variety of other activities and settings; to introduce pre-academic and academic tasks; to provide incidental teaching (McGee, Krantz, Mason, & McClannahan, 1983; McGee, Krantz, & McClannahan, 1985, 1986); to help children learn to make choices and become more independent by teaching them to follow photographic or written activity schedules (MacDuff, Krantz, & McClannahan, 1993; Krantz, MacDuff, & McClannahan, 1993; McClannahan & Krantz, 1997) and to implement strategies to promote social interaction (Krantz & McClannahan, 1993; in press). This technology is often unavailable in regular education settings, and its absence underlines the importance of a continuum of educational placements for children with autism.

Programming Readiness for Transitions to Regular Education

When observational data document children's favorable responses to the previously described intervention procedures, it is time to assess and actively program their readiness for transition from specialized programs to co-education environments. Several objective measures of behavior, used in our setting for two decades, appear to be predictors of later success in public school classrooms.

Sustained Engagement

Ongoing attention to learning materials, teachers, and peers who are interacting with teachers is often critical to successful participation in inclusive settings. Doke and Risley (1972), Hall, Lund, and Jackson (1968), LeLauren and Risley (1972), McClannahan and Krantz (1985), and others examined the use of momentary time-sampling procedures to assess children's participation in planned activities, study behavior, engagement, or on-task behavior. Such repertoires are important because when students with autism are engaged, they are less likely to display stereotypic or disruptive behavior, and their learning opportunities are maximized. Data on the engagement of youngsters with autism, collected for more than two decades, have produced some benchmarks: when observational data show that a target child is consistently scored as engaged on 80% to 100% of time samples, he or she has met our criterion on this predictor of co-educational success.

Following Adults' Instructions

In most public school classrooms, teacher-pupil ratios do not support the presence of children who have not learned to follow directions. In fact, in regular education, individual attention is often available only because students have learned to follow individual and group directions and written instructions. Typically, teachers in regular education environments cannot provide extensive, one-to-one instruction. Therefore, measures of responses to oral and written directions, and to individual and group instructions are salient indicators of children's readiness to make the transition from specialized programs to integrated environments.

Responding to Temporally Delayed Consequences

For typical students, rewards and punishers for school performance are often very remote. For example, parents may deliver money or praise in recognition of good grades on report cards that are issued a few times per year, or may respond to poor marks on report cards by diminishing play time and increasing homework time. These temporally remote events appear to have an impact on the behavior of some nonhandicapped students, but youngsters with autism are not similarly responsive to delayed consequences without specific intervention.

In our specialized behavioral program, children initially learn to respond to the immediate delivery of tangible rewards. Next, they may earn one token and then a small number of tokens that are immediately exchanged for preferred foods or activities. Subsequently, the number of tokens needed for an exchange is gradually increased, so that access to preferred items and events is successively delayed.

When students have learned to tolerate delayed reinforcement, behavioral contracts are introduced. Teachers circle "yes" or "no" on a "school note" after each one-, three-, or five-minute interval, indicating whether the child followed instructions and completed assigned tasks, and the behavioral contract determines whether rewards are delivered or withheld. On the basis of observational data, time intervals are slowly expanded, and a youngster meets criterion when he or she performs well with reinforcement delays that encompass a significant portion of a school day. But an even better predictor of success is data that indicate that school performance is related to consequences delivered at home, by the child's parents. For example, video games or television time may be earned when a note from the teacher verifies that a youngster followed directions, completed assigned work, and did not disrupt classmates. Of course, this presumes that parents are active participants in intervention, and have learned contingently to deliver such consequences.

Exhibiting Generative Language

Typically, it takes a considerable amount of science-based intervention to help youngsters with autism acquire an initial vocabulary of tacts and mands, and to imitate others' speech. But with systematic behavioral programming, some children learn to imitate casual comments and colloquialisms, and to recombine phrases and sentences in novel ways. Our recent investigations of script-fading procedures have been particularly useful in promoting generative language (Krantz & McClannahan, 1993; in press). The presence of novel verbal responses that were never specifically trained is another indicator of readiness for a transition to regular education.

Generalization of Skills Across Settings

Often, the first step in programming for generalization of skills across settings is systematically promoting their transfer from the intervention environment to children's own homes. For example, when a preschooler with autism successfully uses the potty in the preschool, the parents visit the program and participate in the toilet routine. Next, intervention staff visit the home and assist parents with the development of a home routine; ultimately, the parents assume responsibility for maintaining the child's new repertoire, and for reporting data on successes as well as accidents. Similarly, when a child acquires a beginning expressive language repertoire, the parents first request these verbal productions in the intervention setting and later, with the support of intervention personnel, at home. The presence of parents in the specialized setting, and the presence of intervention agents in the home help to mediate generalization of new skills across settings (McClannahan, Krantz, & McGee, 1982).

Later, parents and professionals engage in collaborative efforts to program the transfer of relevant skills to community settings such as grandparents' homes, parks, barber shops, doctors' offices, and grocery stores. Generalization of functional repertoires to environments that were never the topic of training (e.g., playmate's home, clothing store, or church) is another indicator of readiness to make the transition to a public school classroom.

Low Rates of Inappropriate Behavior

Meeting criterion on the five previously described variables is sometimes, but not always associated with low levels of disruptive behavior. Although public school educators are familiar with the teasing, roughhousing, noise, and out-of-seat behavior often exhibited by typical children, a child with an earlier diagnosis of autism who displays (even infrequent) aggression, self injury, or tantrums may be reclassified or returned to the special intervention setting. Thus, a virtual absence of severe disruptive behavior is also a prerequisite for a successful transition to regular education.

On a few occasions (at parents' urging), we initiated transitions to public schools for youngsters who did not yet display the prerequisite repertoires, and these children ultimately returned to the treatment setting. During their sojourns in regular classrooms, neither their language skills nor their academic skills advanced.

Supporting Transitions to Public Schools.

In our experience, few children with autism make successful transitions from specialized programs to integrated settings in the absence of carefully planned introductions to their next environments, and continuing technological support that addresses and resolves potential problems. Such support is delivered in several ways.

Pre-transition instruction.

Teaching a child the responses that will be called for in the new integrated environment is facilitated by close, cooperative relationships between educators in both sending and receiving settings. After the next setting is identified, intervention personnel visit the target classroom to become acquainted with teachers' instructions, children's daily activities, and the materials in use, and to discuss the receiving teachers' performance expectations for the target child. Subsequently, the curriculum used in the new classroom is introduced to the child in the specialized program, so that he or she learns the academic repertoires that are expected of typical students. In addition, the youngster is taught many other specific responses: how to request use of the toilet; how to open a locker; how to articulate the new teacher's name; how to use unfamiliar physical education equipment; how to participate in new group activities; and how to put materials away (McClannahan & Krantz, 1994). This instruction not only promotes children's classroom competencies, but also facilitates peer acceptance.

Gradual transitions to public schools.

Even the most intensive intervention programs cannot instantly prepare children for all of the demands that they will encounter in regular education environments. But closely monitored, gradual transitions permit relevant instruction that contributes to later success. When a child begins a transition from our setting, he or she typically attends the new classroom for a few hours each school day, or for a few school days each week. During this time, the youngster is continuously accompanied by personnel from our intervention setting; they collect data that are

later used to structure teaching activities that are provided when the child returns to our specialized program. For example, they record peers' names, and teach the child to say them. And they collect data on the engagement and social interaction of the target child and his or her classmates (see Figures 1 and 2), and use them to design additional training.

In addition, educators in the new classroom are invited to identify skill deficits and behavior problems that may interfere with the child's successful adaptation; their input is used to design special programs that support the child's expanded participation. Thus, a youngster who initially attends the new classroom for two hours per day later attends for three, and then four hours per day, and ultimately, for the entire school day.

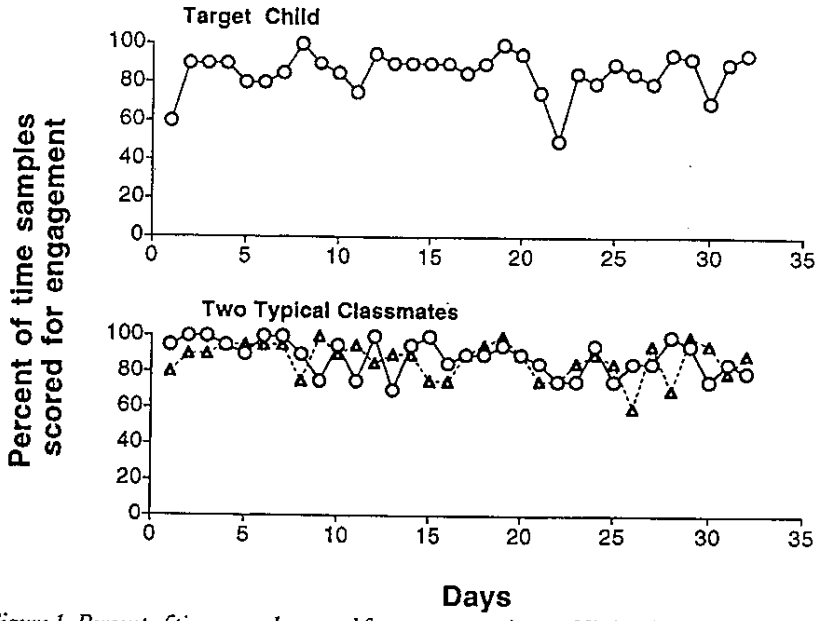

Figure 1. Percent of time samples scored for engagement in a public kindergarten classroom. Interobserver agreement on these intervention data was obtained on 10% of observations, and percentage interobserver agreement ranged from 76% to 100%.

Gradual fading of special supports.

As children's time in public school classrooms increases, the presence of special intervention personnel is gradually faded. First, an accompanying intervention agent may be stationed directly behind the child's desk; when the child is performing well, this person moves several meters away, then to the periphery of the classroom, and then to the hall. When the child's performance is stable, the representative of the specialized setting visits the integrated setting with diminishing frequency. Eventually, observations decrease to a schedule of aperiodic and unob-

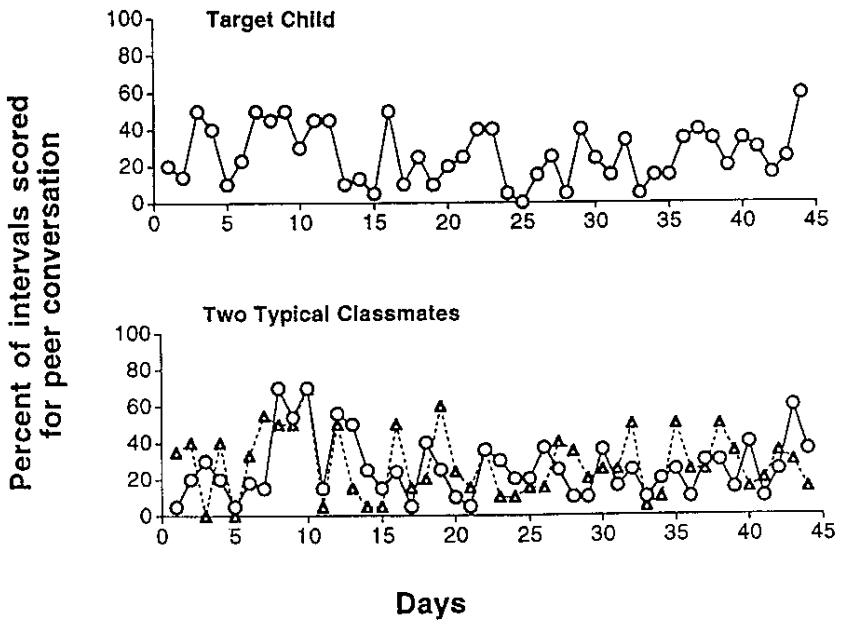

Figure 2. Percent of intervals scored for peer conversation in a public kindergarten classroom. Interobserver agreement was obtained on 11% of observations, and percentage interobserver agreement ranged from 80% to 100%.

trusive monitoring, and then to a schedule of telephone contacts with personnel in the public school. Of course, the emergence of school problems results in immediate reinstatement of classroom visits, and in some cases, regularly scheduled times for the child to return to the specialized setting for supplemental instruction. The gradual fading of special support typically extends over months.

Follow up.

Although pre-transition teaching, gradual introductions to regular education, and gradual fading of support typically achieve good results for target children, their school environments are not static. For example, when promoted to the next grade level, students encounter different classrooms, different teachers, different school routines, and perhaps even different peers. Thus, regular follow-up contacts by special-intervention personnel continue, and follow-up services remain available at the request of school personnel or parents. In some cases, no follow-up services are requested after a child achieves a successful transition; in other cases, youngsters receive follow-up services over a period of many years. Major life changes, such as the transition from elementary school to middle school, separation or divorce of parents, the death of a close relative or friend, or family relocation are sometimes associated with the appearance of school problems that can be resolved by special-

ized follow-up services, so that the student can continue to be successful (McClannahan & Krantz, 1994). It is a matter of concern that there are no local, state, or federal funding mechanisms to underwrite these important services.

Summary

On several continents, we have seen children with physical disabilities and children with mild to moderate retardation who appear to succeed in public schools. They participate in class activities, complete academic assignments, interact with teachers and other students, and are sometimes sought out by their typical peers. In the United States and elsewhere, we have also seen children with autism who, although they attend integrated classrooms, are entirely isolate. They attempt to engage in class activities only when prompted by teachers or aides, are unable to complete the work assigned to other students, are ignored by their typical peers, and often interrupt ongoing teaching and learning activities with noncompliance, tantrums, toilet accidents, stereotypies, aggression, and self injury.

Placing these children in integrated public school classrooms is not merely ineffective; it often produces adverse behavioral outcomes. In the typical case, staffing patterns do not permit the extensive one-to-one support that is necessary if a child tantrums for an hour or engages in ongoing stereotypies such as tapping or clapping, that intrude on the learning activities of other students. Although teachers' aides are usually assigned to such children, these persons are often poorly trained. Not infrequently, their well-meaning efforts are unsuccessful in teaching new skills, and they inadvertently accelerate inappropriate behavior by delivering noncontingent attention.

One solution to this dilemma is to radically enrich teacher-child ratios in public education, and to provide different and highly technical preparation programs for all educators, who will then be expected effectively to serve nonhandicapped children as well as children with all types of disabilities. This option requires financial resources that probably will not be allocated by government. An alternative solution is to provide an array of specialized, science-based intervention programs for children with autism that prepare them to make transitions to regular education. Measures of the effectiveness of such programs are already present (Dawson & Osterling, 1997; Fenske, Zalenski, Krantz, & McClannahan, 1985; Harris & Handleman, 1994; Lovaas, 1987).

Unlike some other agencies, our intervention program does not terminate services on the basis of age. Thus, children who meet the readiness criteria make transitions to public schools, and others may complete their schooling at the Institute and continue in the Adult Life-Skills Program, which features supported, competitive employment. Of 41 children who received services at the Princeton Child Development Institute before 60 months of age, 8 are currently enrolled in the preschool or early intervention program, 14 have made successful transitions to regular education, and 19 are enrolled in the Institute's school program. Because of the small N, the percentage of children who enter treatment before age 5 and achieve successful transitions to public school classrooms varies considerably from year to

year–from 42% to 67%. These calculations do not include children who were withdrawn from the program before an outcome was achieved, nor do they include children who are presently enrolled in the preschool or early intervention programs.

Mean time in treatment for the 14 young children who successfully entered public schools is 37 months (range = 9 to 141 months). The 11 males and 1 female who are still available for follow up presently range in age from 6 to 26 years. The youngest is in kindergarten; the two oldest completed college, and are employed. Others participate in regular schools, from first grade through undergraduate school, and the majority are at their appropriate grade levels.

It is also noteworthy that, of all children served by the Princeton Child Development Institute from 1975 to the present, regardless of age at intervention, 35% to 39% have made successful transitions to public school classrooms. Although there are no comparison groups, we believe that objective measures of their readiness for transition and technical support provided during transition contributes to these outcomes.

Dependable sources of funding for these endeavors are the exception rather than the rule. Continuing research on treatment effectiveness can help to shape services, and to identify and validate relevant outcome measures. In the best case, research results will forge closer connections between program funding and children's progress.

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Discussion of Krantz and McClannahan

Remarks on Krantz and McClannahan

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The paper by Krantz and McClannahan is in many ways a summary of their outstanding work over the past 20 years. They were among the pioneers in demonstrating, through outcomes, the effectiveness of Applied Behavior Analysis in the treatment of persons with autism.

The present paper presents some important issues. First, it raises the question of the appropriate time when autistic children should be put into the public schools. In a point that every educator and parent should attend to, Krantz and McClannahan contend that certain behavior repertoires are necessary for success. The mere proximity to the normally developing student guarantees no success and can very likely have a deleterious effect.

By delineating several behavioral criteria that appear to be predictors of a successful transition to public schools, Krantz and McClannahan have provided something quite useful for those of us who have similar programs but lack their degree of experience. One could easily rate students on the criteria they present and remediate weak areas. This could enhance our ability to successfully transition and save us ensuing problems due to overlooking some crucial set of behaviors. Essentially, the same remarks could be made about their experience based on suggestions for supporting transitions once the decision to implement them is made. Again, there are mistakes to be missed and data based steps to take to insure a successful transition.

It seems to me this paper represents the essence of an applied science. Procedures are delineated, data are gathered, sustainable conclusions are drawn and presented so that others can make appropriate use of those procedures.

Though the authors do not explicitly deal with it, the issue of the proper role of the Behavior Analyst arises from this paper. Krantz and McClannahan consider it appropriate that they try to prepare their students for integration into the public schools when such is possible. Where such integration is not likely to be successful, they try to prepare the student for "...supported competitive employment." I would argue that this is the appropriate role for the Behavior Analyst. To state it unambiguously, I believe we should use our technology to prepare our students to come under the controls that exist in the culture at large. By so doing, we separate ourselves from those helping professions that encourage dependency or do not have the technology to establish independency. Much more could be said on this subject, but it is worth noting that the Krantz and McClannahan paper is an example of this position.

Presently, the use of Applied Behavior Analysis in the treatment of autism is growing at an astounding rate. The demand appears at this moment to exceed the number of trained Behavior Analysts to do the work. With the clarity that Krantz and McClannahan offer us, this situation could possibly be remedied. Perhaps more Behavior Analysts could be induced to bring their skills to this area. Basic techniques and procedures are well spelled out thanks to such papers as the present one.