Practices in Early Intervention for Children with Autism: A Comparison with the National Research Council Recommended Practices

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Abstract: The National Research Council (2001) report was reviewed to identify and document recommended practices for programs serving young children with autism spectrum disorder. Twenty seven surveys inquiring about program practices were sent to educational service districts, school districts, and neurodevelopmental centers in Oregon and Washington that had a program specifically designed to serve young children with autism spectrum disorder. Survey results indicated that the practices currently utilized within autism early intervention programs are in many ways inconsistent with the recommended practices identified in the literature. Implications and future research needs are discussed.

Currently, an estimated 1 in 150 (66.7 in 10,000) children have an autism spectrum disorder (ASD; Center for Disease Control [CDC], 2007). These prevalence estimates are of particular concern because they have increased dramatically from the early 1990s, when the estimated rate was 4 to 8 in 10,000 (Rogers, 1999). In addition to the rise in prevalence, children with ASD are now being identified at an earlier age. Recent research has indicated that ASD can be reliably diagnosed in children by the age of 2 years (Cox, et al., 1999; Osterling & Dawson, 1994; Stone, et al., 1999). More recently, researchers suggest that ASD might be diagnosed as early as 15 to 18 months (Hurth, Shaw, Izenman, Whaley, & Rogers, 1999), and possibly even by 8 to 12 months (Mars, Mauk, & Dowrick, 1998; Osterling & Dawson).

The recent changes in prevalence rates and diagnostic capabilities combined with the regulations of the Individuals with Disabilities Education Improvement Act (IDEIA; US Department of Education, 2006), the federal law that provides special education services to children with disabilities, has led to a significant rise in publicly funded early intervention programs serving infants, toddlers, and preschoolers identified with ASD (Heffin & Simpson, 1998; Hurth et al., 1999). Though the proliferation of intervention programs is promising, the accelerated rate at which these programs have come into existence has increased possibility that some may not adhere to best practices (Handleman & Harris, 2001). Thus, the potential of such programs to improve the outcomes of children with ASD may be compromised. The present study was designed to address the following research question: How do current practices utilized by publicly funded early intervention programs compare to recommended practices?

Historically it has been difficult to analyze areas of agreement regarding best practices among existing intervention programs because few, if any, studies compare different programs of equal intensity (National Research Council, 2001). The challenge of evaluating existing programs was further compounded because little standardization of program evidential bases (e.g., randomization and matching procedures) existed. Similarly, information regarding sample size, ethnicity, family characteristics, reporting measures, and characteristics of students involved in each program has often been lacking or insufficient.
Additionally, long-term follow-up and cost-benefit analysis information has rarely been offered (Dawson & Osterling, 1997; Lovaas, 1987).

In part to address the relative lack of consensus regarding best practices in autism intervention, the National Research Council (NRC) was commissioned by the U.S. Department of Education’s Office of Special Education Programs to review the autism early intervention-related literature. The NRC (2001) was composed of a group of national autism experts who considered the following comprehensive programs in their review: Children’s Unit; Denver Model; Developmental Intervention Model; Douglass Developmental Center; Individualized Support Program; Learning Experiences, an Alternative Program for Preschoolers and Their Parents Preschool; Pivotal Response Model; Treatment and Education of Autistic and Communication-Handicapped Children; Young Autism Project; and Walden Early Childhood Programs. Taken together these represent a sample of nationally recognized, well-established, data-based programs serving children with ASD.

Following their review of existing programs the NRC (2001) developed and disseminated recommendations in the following areas: diagnosis; assessment and prevalence; role of families; goals for educational services; characteristics of effective interventions; public policies; personnel preparations; and needed research. Most relevant to the current study are the recommendations pertaining to goals for educational services and characteristics of effective interventions.

The recommendation related to educational services made by the NRC (2001) specified the need for a specialized curriculum. Specifically, the report indicated eight skill areas that should be carefully targeted within curriculum and programming. They are social skills; expressive, receptive and nonverbal communication; functional symbolic communication; attending to the environment and responding to appropriate motivational systems; fine and gross motor skills; cognitive skills (including symbolic play, basic concepts, academic skills); replacement of problem behaviors with appropriate behaviors; and skills needed to function in a general education classroom.

Beyond educational service recommendations, the NRC (2001) released additional guidelines regarding characteristics of effective early intervention programs. They are summarized as follows. First, intervention should begin as soon as a child is suspected of having ASD. This implies that intervention begins before, or while waiting for, a formal diagnosis to be made, assuming there is reason to suspect that the child will later qualify for services. Next, interventions should be individualized to the student’s and family’s strengths and areas of need. Regarding intensity of services, the NRC suggested that programs serving young children with ASD should provide a minimum of 25 hr of intervention per week, 12 months per year. Further, student-to-staff ratios should be as low as possible, allowing each child to receive individualized therapy and instruction.

Other recommended program characteristics included systematic, planned teaching and monitoring and quantifying child progress on an ongoing basis. The NRC (2001) indicated that this data should be used to assess Individual Education Program (IEP) or Individual Family Service Plan (IFSP) goals and objectives as well as to determine the effectiveness of the program for each child and to decide if program alterations are necessary. Further, inclusion with typically developing peers was recommended, with the stipulation that it leads to educational goals consistent with the educational recommendations previously stated.

Although the NRC (2001) recommendations have the potential to improve the early educational services that are available for children with ASD, this likely will not be the case if existing intervention programs are not consistent with the recommended practices and characteristics. Thus, it is necessary to examine the extent to which current ASD early intervention programs are consistent with the NRC recommendations. This is particularly important to do for publicly funded programs which provide services to the majority of children with developmental disabilities (Bride & Schwartz, 2003) without regard to their family income or resources.
Method

Participants

Participants were directors of ASD early intervention programs in the states of Oregon and Washington. Early intervention services were defined as those serving children birth to 5 years of age. Furthermore, the programs were only selected if they were specifically designed to serve young children with ASD (i.e., not developmental preschools). Finally, programs were limited to publicly funded classrooms providing services in affiliation with a school district, educational service district (ESD), or neurodevelopmental facility. In other words, private programs were not included in this study.

Once these parameters were determined, the offices of the superintendent of public instruction of each state were contacted to obtain information regarding ASD programs. Upon initial contact it was discovered that such information is not available directly from either state superintendent’s office. The difficulty encountered while attempting to generate a list of program contacts is necessary to note for two reasons. First, it illustrates the current disconnect among programs in both states and the state education agencies. This demonstrates one of the obstacles facing organizations and parents wishing to locate effective programs or obtain information about programs generally. Second, the lack of a central database of programs potentially limits the scope of this study. While exhaustive efforts were made to send a survey to every program in both states, it is quite possible that some were overlooked.

After contacting both state superintendents’ offices, the following strategies were employed to gain information about district and ESD affiliated ASD programs. First, the director for the Autism Outreach Project in Washington State was contacted, as were individual ESD directors and early childhood program directors in both states. From these communications, a list of possible programs was generated. Surveys were sent to all programs on the list, which included all Oregon early intervention/early childhood special education (EI/ECSE) areas and all Washington ESDs with possible programs. Finally, individual programs were added to the list and sent surveys based on personal communication with program directors as well as with other autism professionals in both states. It should be noted that in some cases surveys were sent to jurisdictions that were not on the generated list just in case a program might exist. As a result, the overall return rate may underestimate the actual return rate.

Neurodevelopmental providers were also included in the scope of this project. As with the educational programs, information regarding neurodevelopmental programs providing autism specific services was difficult to obtain. Therefore, each neurodevelopmental center in Oregon and Washington was initially emailed, then called. Surveys were then sent to programs that affirmatively responded to having an ASD early intervention program.

Procedure

Once the list of potential participants was established, a cover letter and survey were sent to a total of 26 programs. The survey was addressed to the director of each program based on the assumption that as the person in charge of administering the day-to-day workings of the program the directors would be most likely to be able to accurately respond to the survey questions. A second mailing was made two months following the initial mailing. In total, 17 out of 26 surveys were returned, indicating a 65.4% response rate. Of the 17 returned, ESDs and school districts represented 66%, and neurodevelopmental centers represented 34%.

Measure

The items for the 25-question survey were generated from a content analysis of several published studies that reviewed components of existing effective ASD programs (Dawson & Osterling, 1997; Hurth et al., 1999; Iovannone, Dunlap, Huber, & Kincaid, 2003; NRC, 2001; Powers, 1992). A bank of questions was generated, and from this bank 25 closed questions were selected to create the survey. This type of questioning method was selected because it is relatively easy to complete, thus increasing the chance of return (Fowler, 2002) and so the data could be analyzed using percentages.
(Alreck & Settle, 2004). Many of the questions also included an “other” option, allowing participants to provide an answer different than the options provided. Of these 25 questions, some were selected because they made inquiries regarding practices recommended by the NRC. Others were selected to gain additional information regarding various program characteristics (e.g., logistical information, staffing, teaching methods, etc.).

The survey was field-tested with the following professionals: The director, medical director, and educational director of a local neurodevelopmental facility, the director of an autism program in the state of California, a professor with specialization in the field of autism, and a professor with expertise in the area of survey research. As a result of the field-testing process numerous changes were made to the survey before the final version was sent out.

It should be noted that the original purpose of the survey was twofold. The first aim was to compare actual practices used by programs with the NRC (2001) recommendations. The other was to obtain information not included in the literature that was to be used to help guide the development of a new autism early intervention program. This paper will focus only on the results of the survey questions pertaining to the comparison between the NRC recommended practices and actual practices.

**Data Analysis**

For each survey question the percentage of respondents selecting each option was calculated. Because there were 17 respondents, each response represented 5.88% of the sample. However, for clarity and ease of presentation this percentage was rounded up to 6%. Participants had the option to mark more than one response for each question; therefore it is possible for the total percentage of responses for each question to add up to more than 100%.

**Results**

**Earliest Start to Intervention**

Regarding wait time, a high number of program directors reported students typically experience no wait to begin attending the program (72%). Only one director indicated the program waiting list was no more than 1 month (6%). Several directors specified a wait time of no more than 6 months (24%), and one indicated 1 year or more (6%). A few directors added that wait time varied by the service requested (18%). These responses indicate that students typically experience limited wait time when admitted to most ASD programs.

**Intensity**

*Days per week.* The question regarding number of days per week proved somewhat difficult to answer for many directors, as 48% indicated that the number of days per week depends on the student. A lower percentage indicated student attendance at 5 days per week (24%), followed by 4 days per week (18%), then 3 days per week (12%), with 2 days or less per week cited only by one director (6%).

*Hours per week.* Regarding the number of hours per week most students receive, responses reflect the wide range of hour options currently being provided for students with ASD. The highest percentage of responding program directors indicated students receive 7 to 9 hr per week (36%), followed by 4 to 6 hr per week (24%). Programs providing 3 hr or less (12%), 10–13 hr (12%), 14–16 hr (12%), 17–19 hr (12%) and 23–26 hr (12%) were all equal in number. Finally, one director marked the “other” option (6%) but did not specify hours.

*Student-to-staff ratio.* Directors also had difficulty providing information regarding student-to-staff ratio, with many marking more than one answer. A high percentage gave the student-to-staff ratio of 1:1–3 (90%). Next, directors indicated a ratio of 1:3–6 students (42%), while a smaller number said the ratio was 1:6–9 students (24%). No directors reported a ratio at or higher than 1 staff member to every 10 or more students.

**Access to Typically Developing Peers**

A large majority of directors indicated that students with ASD have access to typically developing peers while attending the program.
Of the program directors providing inclusion opportunities, most indicated that students with ASD have access to typical peers 50% or less of the time. In reviewing the additional written comments made by directors, it also was made clear that within programs some students may have access to these peers, while others do not.

**General Intervention Approaches**

Directors were provided with five recognized intervention approaches within the field of ASD research noted by the NRC (2001). These approaches were applied behavior analysis (ABA), neobehavioral (Lifeskills and Education for Students with Autism and other Pervasive Behavioral Challenges [LEAP]), Treatment and Education of Autistic and Related Communication-Handicapped Children (TEACCH), interactive approaches (Floor-time), and developmental theory (Denver Model). As expected, the directors surveyed employ an array of different teaching approaches. The most common approach indicated was applied behavior analysis (54%). A few directors also indicated approaches not listed as responses (12%), but did not specify the respective approaches. Many directors checked more than one approach, writing that their program is completely integrated. More than half of the programs reported utilizing a blended approach (54%). Directors selecting the blended approach were asked to provide the percentage of time each approach is used. Table 1 outlines the teaching approaches and percentages provided by these program directors.

**Curriculum and Instruction**

Directors were to indicate the specific instructional methods and curriculums utilized in their programs. They were given a choice of one-on-one instruction, group instruction, discrete trial teaching (DTT), incidental teaching, peer mediated/naturalistic, Strategies Based on Autism Research (STAR), functional routines, Playschool curriculum, positive behavior support, and Floortime. Most program directors reported employing several different methods. All of the directors surveyed checked one-on-one instruction as a method used within their program (100%). Other instructional methods and curricula used by a high percentage of programs included functional routines (84%), group instruction (78%), incidental teaching (78%), and structured teaching (78%). Other methods reported were discrete trial teaching (66%), positive behavior support (66%), Developmental, Individual Differences, Relationship-Based Approach/Floortime (54%), peer mediated/naturalistic methods (48%), and pivotal response training (48%). Finally, the Strategies Based on Autism Research Program (42%), Playschool curriculum (24%), and other methods (12%) were all noted as in-
structional and curricular methods employed by programs.

Problem Behavior Prevention

Most directors surveyed reported a variety of strategies to prevent problem behaviors. All of the programs use predictability and routine (100%). Most reported using direct instruction in basic behavioral skills (90%), a functional approach to problem behaviors (84%), and positive behavior intervention (84%). A slightly smaller percentage utilized a highly structured environment (78%), functional behavior assessment (78%), and principles of applied behavior analysis (72%). A lower number of directors reported using a consequence-based approach (30%), and only one reported using physically intrusive or aversive methods (6%).

Monitoring Student Progress and Success

To measure student progress and success, a high percentage of programs reported evaluating whether IEP or IFSP goals and objectives have been met (88%). Others reported using structured assessments (71%), parent and teacher ratings (65%), and long-term outcome studies (24%). Thirty-five percent of directors reported considering students and staff having fun as a measure of student and program success.

Individualization for Families

In terms of family individualization, all directors indicated that parents receive specific training regarding strategies to teach and support their children as a part of their program (100%). Many also noted that support for families (60%) and intervention services for children (54%) are provided in the home. In addition, a number of programs use parents as volunteers (42%). A number of directors marked the “other” option for this question (30%) and explained that their program provides parent organizations and education programs (30%).

Discussion

Because it is clear that an early start to intervention is highly correlated with positive outcomes for children with ASD (Rogers, 1996), the NRC (2001) has recommended an early start to intervention. Most directors surveyed allow children to enter their programs immediately upon referral, though 24% of directors indicated a wait time of approximately 6 months and 6% a wait time of over a year. It appears that most of the programs surveyed are able to provide services to children with minimal wait time, however, it is concerning that there are many programs that are not able to provide services as soon as a referral is made. It will be important for existing and new intervention programs to take the necessary steps to reduce wait-time for services as much as possible.

In addition to the need for an early start to intervention, the NRC (2001) stressed the importance of intensity of engagement, measured in days per week, hours per week, and student-to-staff ratio. Regarding days per week, the NRC recommended that children receive intervention 5 days per week. Comparing this recommendation to the number of hours per week indicated by the directors surveyed we found significant variability. For example, only 24% indicated student attendance of 5 days per week. It should be noted that many directors indicated that student attendance decisions are made on an individual basis and, therefore, did not provide exact numbers. These numbers are still concerning as the majority of children served by the programs surveyed appear to be receiving services less than 5 days per week.

Similarly concerning was the number of reported hours per week in which services were provided. Particularly troubling was the wide variation in the number of hours across programs. Only 12% of programs reported providing 23-26 hours per week, numbers within the range recommended by the NRC (2001), whereas 72% of programs provide less than 9 hours per week. The effectiveness of providing a high number of intervention hours is well documented in the research literature (McEachin, Smith, & Lovaas, 1993; NRC), yet our results indicate that most of the programs surveyed are not providing anywhere near the
number of recommended hours. Taken together, our results regarding the number of days and hours per week provided suggest that the outcomes of children with ASD enrolled in many public early intervention programs likely will be less than optimal in both the short- and long-term.

The third factor related to intensity of engagement is student-to-staff ratio, with the NRC (2001) recommending a low classroom ratio. Survey results related to this issue showed that most programs provide 1 staff member to every 1–3 students. These results are encouraging, however, many directors also reported a ratio of 1:3–6 students. Because directors were allowed to check more than one survey response it appears that ratios may vary within programs depending on the needs of each student. It is important to note that the staff ratios reported include certified teachers and paraprofessionals, as well as specialists (e.g., speech and language pathologists). This is significant because many early intervention professionals do not receive adequate formal training in assessment and instructional methods that they can use in the classroom to facilitate the development of young children with ASD and related developmental disabilities (Bricker, 1995; Schepis, Reid, Ownby, & Parsons, 2001). This may be especially true for the increasing number of paraeducators working in early intervention settings (Giangreco & Doyle, 2002; Giangreco, Edelman, Broer, & Doyle, 2001) who have lower levels of education and training than do certified teachers (Riggs & Mueller, 2001). As ASD programs continue to expand it will be important to ensure that all staff in such settings are adequately trained and capable of positively contributing to the development of the children in their care.

The NRC (2001) also recommended that programs provide access to typically developing peers, though it did not specify the amount of time within each day that should be spent in contact with such peers. The majority of programs surveyed provide access to peers, though the amount of time varies greatly among programs, with most directors indicating that students with ASD have access to typical peers 50% or less of their total time in program. It may be helpful for future recommendations to include specific information regarding the amount of time students should have access to typical peers.

The NRC (2001) did not endorse one type of teaching approach over another. Perhaps not surprisingly, our survey results indicated that programs are utilizing a wide variety of teaching approaches. Over 50% of the directors reported using applied behavior analysis, and over 50% also reported using a blended approach. Whereas the effectiveness of applied behavior analytic approaches have been documented in the research literature (Lovaas, 1987; McEachin et al., 1993), the research is still inconclusive regarding the effectiveness of using a blended approach. With the current use of blended methods there appears to be a risk of drift from the types of systematic, planned instruction that have been found to be so effective with young children who have ASD. Future research should focus on the effectiveness of blended approaches, as well as the ability of programs to provide systematic, planned instruction through the use of a blended approach.

Providing a specialized curriculum clearly targeting deficit skill areas is a clear recommendation made by the NRC (2001). Our results suggest that most programs are using a specialized curriculum. As with types of teaching approaches, it appears that programs are utilizing a wide variety of curriculums and often blending many different curriculums. Future research is warranted to examine the effectiveness of blending multiple curriculums and strategies. Further, research should search for the factors involved in selecting the different types of curriculums and strategies within each program. For example, are strategies selected based on the preferences of program personnel or in response to the effectiveness of the strategies when used with the particular child? In addition, it will be important to examine the extent to which the curriculums and strategies employed address the developmental skill areas outlined in the NRC recommendations.

A related issue is how programs measure student progress and success. The NRC (2001) stressed the importance of monitoring and quantifying child progress on an ongoing basis. Consistent with the NRC recommendations the large majority of program directors reported assessing child progress toward IEP/
IFSP goals. Most directors also reported using a multi-method, multi-informant assessment approach including structured assessments, as well as parent and teacher ratings. Thus, it appears that most of the programs surveyed are monitoring child progress as recommended by the NRC. What is less clear is whether the programs are using such data to make alterations to each child’s program as necessary. As noted by Downs and Strand (2006) this is a critical issue that is often neglected and which needs to be effectively addressed by all early intervention programs.

Employing strategies to prevent problem behaviors is another practice recommended by the NRC (2001). All directors surveyed reported the use of such strategies. The majority reported predictability and routine, direct instruction in basic behavioral skills, a functional approach to problem behaviors, and positive behavioral intervention as the primary strategies utilized. This is a recommendation that most of the programs surveyed appear to be following.

Similarly, little debate exists in the research literature regarding the importance of family involvement and individualization in an ASD program, as noted by the NRC (2001). This consensus is echoed in the survey results, as all programs provide specific training to enable parents to teach and support their child. This is the recommendation that the highest percentage of respondents reported following, though the way in which families are included varies from program to program. It is important to note that the conclusions that can be drawn from this study are limited somewhat by the methodology employed. Specifically, this study, as is the case with all survey research, relied on self-report rather than actual observation of programs. Thus, it is not possible to be certain that the practices reported by program directors are actually in place. In fact, because self-report biases typically serve to cast respondents in a positive light it is possible that the programs surveyed may be providing services that are even less consistent with the NRC recommendations than those reported. A related issue is the importance of assessing whether specific teaching approaches are being implemented with appropriate fidelity. Future studies should seek to compare self-reports with observational data to provide a potentially more accurate assessment of program components and fidelity.

This study also was limited somewhat by the possibility of sampling bias. There is no central registry of ASD programs serving young children in Oregon and Washington. Therefore, obtaining name and contact information proved to be a daunting task and may have limited the number of ASD programs included in the survey process, as at least a few potentially eligible programs may not have received a survey. This study was also limited by surveying only two states. Further, though the response rate was quite high (65.4%), it is possible that responders and non-responders may have differed in some way. However, it is important to note that surveys were sent to some jurisdictions where there was not confirmation that an ASD program even existed. As a result, it is quite likely that the actual rate of return was higher than indicated. In addition, the response rate among programs in rural areas (i.e., those with a population under 50,000) was 57% and the response rate among programs in urban and suburban areas was 68%, suggesting a fairly good geographic distribution in the final sample. Still, the potential sampling biases noted underscore the need to examine this issue on a national level.

Despite the limitations noted, this study provides some useful information regarding the practices and characteristics of early intervention programs for young children with ASD.

As the number of children diagnosed with ASD continues to rise, it is likely that the number of publicly funded program designed to meet the needs of these children and their families will also continue to rise. As this occurs it will be important for programs to carefully consider the recommendations put forth by the NRC (2001) regarding best practices for providing services for these young citizens. Although they should be interpreted cautiously, the results of the present study suggest that many programs may not currently meet many of these recommendations. Further, it is clear that the strategies utilized from program to program likely vary widely, and it is unclear how each program is making individual programming determinations. As programs continue to proliferate to meet the needs of the
increasing number of children identified with ASD, it will be necessary to monitor the consistency with which such programs are aligned with the best practices and recommendations outlined in the literature. Future research should also focus on how to best support programs in following the recommendations more closely, so that children with ASD may receive the most effective intervention possible.

References


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