



# Applied Behavioral Analysis

Special Education > Applied Behavioral Analysis

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teachers designing programs or working with autistic children are offered to help them develop the most effective programs through partnerships and collaboration.

## Overview

Autism spectrum disorders is an umbrella term for a family of neuro-developmental conditions characterized by early-onset social and communication disabilities, challenges with imagination, and restrictive behaviors that range from stereotyped movements to accumulating vast amounts of information on specific topics (Volkmar, Lord, Bailey, Schultz, & Klin, 2004). Impairments in social interaction is one of the main factors typical of autism disorders, and these disorders also cause multiple deficits in language, play, eye contact, and gestures (Kanner, 1943). According to the Individuals with Disabilities Education Act (IDEA), other characteristics of autism include “irregularities in communication, repetitive movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences” with the added restriction of the capacity for abstract thought, especially as the individual ages (Hardman, Drew, Egan, & Wolf, 1993).

Autism is a life-long impairment with multiple impacts. Early intervention is central to overcoming many of the difficulties resulting from autism. Despite evidence that autism disorders can be identified as early as 18 months, many children are not identified until much later. As of 2007, children will be screened for autism during well baby checks twice yearly. Given these advancements in early diagnosis, advancements in early intervention programs at earlier ages have also been made (Centers for Disease Control, 2007). Theoretically, many of the interventions developed and offered to autistic children remain highly questionable and untested in terms of long-term research and impact. According to Reed, Osborne & Corness (2007), “It should be noted that it is not clear to the degree to which any program has fidelity to the manual in the face of specific demands of individual children..., and [they] vary from individual- to-individual, and from day-to-day within individuals” (p. 432).

Available treatments for autism vary significantly in terms of “context (e.g., school vs. home), intensity, and theoretical under-

## Abstract

Applied Behavioral Analysis (ABA) is utilized in home and school environments as a behavior intervention system for children with autism spectrum disorders. This article presents a brief introduction to the history of ABA and its inception. Further discussed are ways ABA is utilized in a public school setting through education strategies and roles and impacts on certain groups that include students, teachers, and administrators. Solutions for new

## Keywords

**Adaptive Behavioral Function**

**Autism Spectrum Disorders**

**Behavioral Intervention**

**Early Intervention**

**Educational Function**

**Intellectual Function**

pinning.” Many children receive a variety of treatments, and it should be noted that parents and professionals face difficulty in determining the most appropriate programming for children in accordance with their age, severity of impact, and philosophy (Sheinkopf & Siegel, 1998, p. 15). Before children are placed in a school environment, home programs are typically developed and are used to prepare children for school and community environments. Most behavioral treatment protocols require highly structured, time consuming, and intensive programs. Applied Behavior Analysis has been recommended as a treatment option for autism spectrum disorders (McIlvane, 2006).

### Background of Applied Behavioral Analysis

Reed, Osborne and Corness (2007) explain that Applied Behavioral Analysis (ABA) is based on the behaviorist approach of altering behaviors through systematic, extrinsically reinforced behavior modification and training originating from the philosophies of B. F. Skinner, and there are a number of different ABA approaches that have been outlined in a variety of sources. In general, these approaches involve:

- The one-to-one teaching of children with autism by adult tutors;
- A discrete-trial reinforcement-based method; and
- An intensive regime (up to 40 hours a week, for 3 years, in some instances) (p. 419).

One such favored approach operating from this methodology was developed by Lovaas and was entitled the Early Intervention Program or EIP. Lovaas is considered to be the founder of the ABA approach, and his philosophies, program overview, and findings will be examined.

### The Lovaas Method

The Lovaas method of ABA that is central to the UCLA Young Autism Project was first developed to maximize behavioral gains made by children during every waking minute. The complete outline for treatment was described in Lovaas' (1981) book entitled: *Teaching Developmentally Disabled Children: The Me Book*. For the most part, the model is based partially on the principles of operant learning. The primary teaching method is based on discrete trial discrimination learning and compliance

with simple commands. Simple commands include: “sit down,” “put here,” and “look at me.” All negative and aggressive behaviors initiated by the child are ignored or punished, and positive behaviors are reinforced. In some cases physical punishments or verbal reprimands are used to extinguish negative behaviors. These punitive reprimands can be represented as a loud “No!” or a slap on the thigh.

The most significant hallmark of the Lovaas program was the duration of time spent in program and program development. According to Lovaas (1987), the program was designed to occur over a 3-year time frame for 365 days per year with a minimum of 40-hours or more a week of initiation. The program outline mandates that for the first year, the majority of attention is focused on the reduction of self stimulatory and aggressive behaviors, increasing imitation responses, generating appropriate toy play, and extending treatment into the family. In the second year of the program, expressive and abstract language is taught as well as “appropriate” social interactions with peers. The third year of the program emphasizes the teaching of appropriate emotional expression, pre-academic tasks, such as reading, writing, and math, and observational learning of peers involved in academic tasks. The average cost of an Applied Behavioral Analysis program based on the Lovaas' model costs an estimated \$60,000 per year per child (“Alternatives to Lovaas' Therapy,” 1996).

After the conclusion of Lovaas' 1987 findings based on his original study and results, he wrote and published a paper outlining his findings. Initial results reported by Lovaas (1987) concerning the effectiveness of the ABA approach seemed to be miraculous in their results. According to Lovaas' research regarding his designed treatment, children who underwent this approach “made gains of up to 30 IQ points (a finding noted in some children with autism spectrum disorders undergoing special educational programs) (Gabriels et al., 2001). Just less than half of these children appeared to recover, that is, they were not noticeably different from normally developing children after 3 years of the intervention” (Reed, Osborne, & Corness, 2007, p. 419). Despite these amazing results, Lovaas' critics have noted numerous problems with the original study.

### Criticism of Results

Firstly, critics allege that one significant problem with Lovaas' 1987 study revealed that Lovaas selected verbal, relatively high functioning participants who might have performed well with reasonable input (Reed, Osborne, & Corness, 2007, p. 419). Secondly, many of the questions surrounding Lovaas' study are centered around the fact that the study was clinical rather than school or community based, which raises questions about generalizability from the clinic to school and community settings (p. 419). Thirdly, all of the “significant number of critiques of Lovaas' original piece of research (i.e., Lovaas, 1987) have focused on problems both with the internal and external validity of the study (e.g., Connor, 1998; Gresham & MacMillan, 1997; Mudford et al., 2001)” (Reed, Osborne, & Corness, 2007, p. 419). These problems create confusion about the actual results of the study and whether the results justify the costs of the program.

In their recent study, Reed, Osborne, and Corness (2007) examined three different autism interventions in a community setting. The three interventions studied comparisons between the ABA model, the portage model, and a special nursery placement. Several findings resulted from this study that both support the ABA model in some instances, as well as other interventions that were less costly and time consuming, yet still offering some features of the ABA model including one-on-one tutoring and overlaps between home and educational environments. Program impacts examined results on stereotyped behaviors, communication difficulties, social interaction, and developmental disturbances. They found that,

“on the basis of the GARS rating of autism symptom severity that none of the interventions produced recovery, as noted in some previous studies (e.g., Lovaas, 1987). This finding corroborates a number of other studies of the effectiveness of ABA approaches and adds to the current weight of evidence that the ABA approach will not cure autism” (Reed, Osborne, & Corness, 2007, p. 430).

Reed, Osborne, and Corness concluded that the current reports in their study

“failed to note any evidence of recovery from autism produced by any early intervention. In terms of intellectual functioning, applied behavior analysis and special nursery interventions produced gains (of the same magnitude as many gains produced by previous longer term clinic-based ABA programs). The results from clinic-based ABA trials were partially replicated on a community-based sample; specifically with respect to intellectual and educational skills. Special nursery placement was also found to be effective for improving adaptive behavior and educational skills” (p. 432).

They also stressed the “relative importance of educational skills versus adaptive behavioral skills at preschool for subsequent school functioning and school inclusion, which they stressed continues to be investigated” (Reed, Osborne, & Corness, 2007, p. 432). Based on these findings, it is important to remember that numerous interventions have been developed for autism treatment, but many have not been studied closely and structured research has not been developed to adequately study the results of the application in school and community settings.

## Applications

### Students

Philosophies regarding children and programming impacts are central to the approaches that govern autism intervention program development. Clearly more study must be conducted in order to determine and understand the long-term impacts of all interventions on children with autism, because so many disparities and inconclusive evidence exist. Typical ABA intervention programs are designed to begin between 35 months of age to 40

months of age or between age three to four. Applied Behavioral Analysis programs also are designed to have a close one-to-one tutor relationship by someone trained in the method, and the program is designed to last three years, 365 days per year, with a minimum of 40 hours per week. This program demands that an ABA specialist is hired by the family, brought into the home possibly to live, and works with the child intensively. The specialist often accompanies the child to school in order to work with the child in a school environment. The overall, approximate cost of a program like this is an estimated \$60,000 (“Alternatives to Lovaas’ Therapy,” 1996).

For children aged 3 to 4 entering into such an intensive program as the ABA model, it seems that parents must investigate all aspects of the programming debate and conclusively examine scientific evidence and accurate reporting of scientific impacts on children with autism (Eikeseth, 2001, p. 250). Not examined in any of these programming discussions are the resulting or potential emotional and mental demands or impacts on children that participate in programming. Another relevant consideration is impacts on a school environment and resulting responsibilities of educational professionals in facilitating implementation of these programs.

### Educators

More and more educators are being asked to co-facilitate or at least understand home intervention programs and ways these programs coordinate with school environments. Educators must be familiar with key terminologies and how they relate to children with autism disorder. Often, children with autism disorders are enrolled in general education environments. The general education teacher must accommodate the needs of all children in the classroom and in order to facilitate a “system of diversity” must understand the uniqueness of all children. Therefore, more training and professional development in these programs is necessary to meet the needs of students and parents. Educators should also pay attention to how programs are being used in educational settings and potential successes or shortfalls attributed to the program. Within the context of educational team meetings driving the program for the autistic child, questions, advocacies and concerns should be discussed and understood. Communication and collaboration are central to program development.

The other significant understanding that educators must possess in their work with children with autism is in having a sense of how autism impacts families. Once educators understand how stressful these life factors are, they can begin to understand the difficulties faced by parents of autistic children. Many of these families are desperate for answers and want to “fix” their children. They become so propelled to this end that they become willing to try anything. For educators who know little about family systems’ theories and impacts, autism interventions, and specific philosophies guiding autism interventions, it is recommended that more research is conducted in order to have some sense of how these interventions work, the benefits, research surrounding the interventions, and ways the classroom is impacted through implementation of these programs. Educational staff is cautioned never to recommend a given approach due to the

personal and professional liabilities and potential financial responsibilities that could be incurred by the district for one of its own recommending a specific approach. Also, educators must pay keen attention to parents that enter an educational setting and demand that the school provide funds for a specific program.

### Administrators

Administrators also must understand the interplay of autism programming in the school environment. For new administrators, they must spend some time learning about systems' processes, inputs and outputs. Administrators are being asked by parents to make accommodations and allowances based on these educational programs. Legal problems are manifesting as evidenced by a New Jersey case in which a judge ordered a school district to provide 70 hours of in-home Lovaas therapy a week to a young child ("Alternatives to Lovaas Therapy," 1996, p. 1). The concept behind this ruling seemed to indicate that if "40 hours were good, 70 hours would be excellent" (Gresham & MacMillan, 1998, p. 11). Central to the criticism regarding this decision is that a 70-hour/week treatment program has never been evaluated. Despite these criticisms, parents and professionals cling to specific interventions in working with autistic children. In order to cling so tightly to specific interventions further community and school based research is called for in understanding best results and best programming.

Administrators are often called to facilitate communication and relationships between parents and educational staff. Due to the potential financial responsibilities and liabilities regarding best approaches and best interventions, it would be beneficial to possess a deep understanding regarding benefits and shortfalls of specific autism interventions. Administrators are also cautioned to safeguard communications between educational staff and parents regarding specific interventions due to the high stakes liability of potential lawsuits regarding autism practices and the potential for school district and tax payer responsibility. It is highly recommended that administrators consider an in-service or providing professional development in this area.

### Issues

#### Implementation of Autism Interventions & Approaches

The ABA approach has been acclaimed and criticized for various reasons. This approach has been lauded as producing amazing results for children meeting characteristics that fit within the guidelines utilized in Lovaas' research. To indicate that it is the only method that works or that the studies surrounding its use were not limited by various procedures only serves to bring into query appropriate interventions that meet the needs of all children, because according to Kazdin (1993) parents and professionals should understand how and why treatment outcomes differ. It is critical to understand differences between best and worst responders within a treatment group (p. 378). This does not indicate that ABA does not work for some children. In fact, proponents of the program refuse to engage any other approaches

that might be as beneficial. The main question and criticism of this program is in understanding full psychological impacts on children in engaging 3-and-4-year-old children in campaigns of such rigor and intensity for the sake of ameliorating a disorder that has no cure. According to Reed, Osborne, and Corness (2007), "[T]he current report failed to note any evidence of recovery from autism produced by any early intervention" (p. 432). Reasonably, parents and professionals can expect improvements in IQ points, some adaptive functioning, and more appropriate adaptive communication and verbal skills with the implementation of a consistent, age-appropriate, intervention program.

### Conclusion

With the increasing numbers of children in public education environments diagnosed with autism, educational professionals must be attuned to the specific developmental needs of these children and their learning requirements. Children with autism face many difficulties. These difficulties can be both academic and behavioral, but all are underscored by communication deficits. Educational professionals are often mandated to serve the autistic child in a variety of ways. Teachers are often required to be knowledgeable regarding best practice and have some background in autism interventions. Unless teachers specifically research the multiple interventions available, little training is offered in these areas.

Autistic children vary significantly in their maturity, intellectual variety, and function. They are truly unique and despite variances in behaviors and the time and attention required to work with them witnessing any and all growth is an exciting breakthrough. Most important to remember in working with these children is that all children, despite diagnoses or impact, continue to develop and mature according to their own strengths and uniqueness. To meet all of the needs of students in a given classroom, teachers should consider developing a "system of diversity" in facilitating an appropriate and functional environment.

### Terms & Concepts

**Applied Behavioral Analysis:** The ABA program is typically designed to occur over a 3-year time frame for a duration of 365 days per year with a minimum of 40-hours or more a week of initiation with specific areas of focus to be implemented each year of the program.

**Autism Spectrum Disorders:** Autism spectrum disorders is an umbrella term for a family of neuro-developmental conditions characterized by early-onset social and communication disabilities, challenges with imagination, and restrictive behaviors that interests ranging from stereotyped movements to accumulating vast amounts of information on specific topics (Volkmar, Lord, Bailey, Schultz, & Klin, 2004).

**Behavioral Intervention:** Behavioral interventions can be described as specific types of autism interventions designed to improve behaviors and ameliorate problematic functions of the autistic child.



**Early Intervention:** Early intervention can be described as a window of opportunity between 35 to 40 months of age when children should receive appropriate interventions designed to intensively, substantively, and positively affect academic and behavioral outcomes for the autistic child. Latest research indicates that early intervention can take place as early as 18 months.

**Educational Function:** Educational function can be described as the level of function appropriated by the autistic child in an educational setting. This function can vary from child to child. It should also be noted that research suggests that children with autism significantly behave at a lower level of functional maturity than non-autistic children.

**Intellectual Function:** Intellectual function can be described as a combination of intelligence factors and mental age functioning that is used to predict capacities and potential outcomes for a child's success.

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## Additional Links to Intervention Websites

- Applied Behavior Analysis (ABA), <http://featbc.org/www/featbc/INFOSOURCES.html>
- Asperger Help at <http://aspergerhelp.net>
- Floortime Therapy, <http://www.floortime.org/>
- Gluten Free, Casein Free Diet (GFCF). <http://www.gfcfdiet.com/>
- Speech Therapy, <http://www.asha.org/default.htm>
- Occupational Therapy, <http://www.aotf.org/>
- Picture Exchange Communication System ®, <http://www.pecs.com/>
- Social Communication, Emotional Regulation and Transactional Support ®, <http://www.scerts.com/>
- Sensory Integration Therapy, <http://www.incrediblehorizons.com/sensory-integration.htm>
- Relationship Development Intervention, <http://www.rdiconnect.com/>
- Verbal Behavior Intervention, <http://vbcommunity.org.uk>
- Treatment and Education of Autistic and Communication Handicapped Children method ®. <http://www.teacch.com/>

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