

## APPLIED BEHAVIOR ANALYSIS FOR CHILDHOOD AUTISM: DOES THE EMPEROR HAVE CLOTHES?

James D. Herbert & Lynn L. Brandsma  
MCP Hahnemann University & Villanova University

## Abstract

Programs based on applied behavior analysis (ABA) have become increasingly popular as interventions for childhood autism. A number of leading behavior analysts even have claimed that many children with autism can be “cured” through such programs and therefore strongly recommend ABA over alternative interventions. The extant research literature, however, does not support these claims. ABA programs for childhood autism are indeed promising, but exaggerated claims may undermine confidence in the approach, and are misleading to families of autistic children and to other stakeholders.

Empiricism has always been one of the key defining features of applied behavior analysis (ABA) (Cooper, Heron & Heward, 1987). Both theoretical and technological developments are closely tied to objective data (Zuriff, 1985). In keeping with the high value placed on pragmatism, the link between basic behavioral principles and the technological developments that stem from these principles is emphasized. Technological developments such as interventions for psychological disorders and behavioral problems are not relegated to an afterthought, but are central to the entire enterprise.

The recent movement toward empirically supported treatments (ESTs) in the field of clinical psychology therefore represents nothing new to applied behavior analysts. Although debates are currently raging among clinical psychologists and other mental health professionals regarding the relevance of outcome research to clinical practice, the idea that interventions should be informed by data is axiomatic to the behavior analyst. Applied behavior analysts may join other empirically-minded professionals in quibbling over details (e.g., the specific criteria that should be used to justify claims of empirical support for an intervention; cf. Herbert, 2000; Lohr, DeMaio,

& McGlynn, in press), but the idea that “the data matter” is not in dispute.

## ABA AND CHILDHOOD AUTISM

The conventional wisdom within the field of ABA is that one of the most significant – if not the single most significant – empirically supported success story is ABA-based early intervention for developmental disabilities, and childhood autism in particular. In fact, the association of ABA with intervention programs for childhood autism has become so strong that Hayes (2001) recently warned that ABA “is gradually becoming a subfield of developmental disabilities” (p. 61). Indeed, the Internet home page of the Cambridge Center for Behavioral Studies ([www.behavior.org](http://www.behavior.org)) prominently features ABA programs for autism. The premier ABA journal, the *Journal of Applied Behavior Analysis*, frequently publishes articles on the application of ABA for developmental disabilities. In a feature article on Autism, *Newsweek* magazine described ABA as “the standard approach” to intervention with autism (Cowley, July 31, 2000, p. 52). The ABC News program *Nightline* recently featured ABA for autism (March 9, 2001). The New York State Department of Health (1999) recently issued clinical practice guidelines for autism in which ABA is recommended as a critical element of any intervention program for childhood autism.

The astounding success of ABA early intervention programs for children with autism is proclaimed not only in the professional literature, but also in books and Internet sites

**Author Note:** Correspondence concerning this article should be addressed to James D. Herbert, Department of Clinical and Health Psychology, MCP Hahnemann University, Mail Stop 988, 245 N. 15<sup>th</sup> Street, Philadelphia, PA 19102-1192, or via electronic mail to [james.herbert@drexel.edu](mailto:james.herbert@drexel.edu)

targeted to parents and other stakeholders. These publications frequently announce that ABA programs can result in dramatic developmental gains for many autistic individuals. In fact, it is claimed that many of these children can eventually function in normal education settings, and are indistinguishable from their normally developing peers. In other words, many can be "cured" of their disorder. Consider, for example, the following passages gleaned from the literature on ABA for autism:

Several studies have now shown that one treatment approach – early, intensive instruction using the methods of Applied Behavior Analysis – can result in dramatic improvements for children with autism: successful integration in regular schools for many, completely normal functioning for some (Green, 1996b, p. 29).

There is little doubt that early intervention based on the principles and practices of Applied Behavior Analysis can produce large, comprehensive, lasting, and meaningful improvements in many important domains for a large proportion of children with autism. For some, those improvements can amount to achievement of completely normal intellectual, social, academic, communicative and adaptive functioning (Green, 1996b, p. 38).

Furthermore, we also now know that applying effective interventions when children are very young (e.g., under the age of 3-4 years) has the potential for achieving substantial and widespread gains and even normal functioning in a certain number of these youngsters (Schreibman, 2000, p. 374).

During the past 15 years research has begun to demonstrate that significant proportions of children with autism or PDD who participate in early intensive intervention based on the principles of applied behavior analysis (ABA) achieve normal or near-normal

functioning... (Jacobson, Mulick, & Green, 1998, p. 204).

Similar claims abound on the Internet. For example, the Director of the Autism Research Institute claims on that organization's web site ([www.autism.com/ari/editorials](http://www.autism.com/ari/editorials)) that "the evidence shows that it is possible for at least some autistic children to learn how to overcome their disability..." and "I am more than willing to accept, and to celebrate, recovery from autism. Let's have more of it!" In addition to the claims made by professionals, parents have written books (e.g., Maurice, 1993) and developed websites (e.g., <http://rsaffran.tripod.com/aba.html>) extolling ABA as a cure for autism.

Given the strong value that ABA places on quantitative data, one would assume that such claims are firmly grounded in sound scientific research. Unfortunately, examination of the scientific literature tells a very different story. In fact, we believe that claims such as those above are not only unsupported by the available evidence, but are also highly misleading. Furthermore, some of the authors of such claims are themselves among the most vocal critics of various non-behavioral intervention approaches for autism. They rightly decry the wide gap between the claims made about the effectiveness of such programs and the extant scientific literature (Green, 1994; 1996a; 2001; Smith, 1996).

#### What Does the Research Actually Say?

A detailed review of the literature on the treatment of autism is beyond the scope of this paper; we refer the interested reader to papers by Herbert, Sharp, and Gaudiano (in press) and Rapin (1997). We will, however, highlight several features of this literature that bear on the claims made about ABA programs for autism.

It is first important to distinguish comprehensive ABA programs from behaviorally-based interventions targeting specific problems that are frequently associated with autism and other developmental disabilities (e.g., self-stimulation, self-injurious behavior;

Rogers, 1998). Our concern is not about the latter, which have not typically been associated with unwarranted claims, but instead with the former. Ivar Lovaas developed the most popular ABA program for childhood autism at the University of California at Los Angeles in the 1970s. Although the program was initially called the "Young Autism Project," it is often termed "discrete trial training," the "Lovaas model," the "UCLA model," or simply "ABA for autism". Early intervention programs based on Lovaas' pioneering work have become increasingly popular over the past decade, and several variations of his program have been developed (e.g., McClannahan & Krantz, 2001; Weiss & Piccolo, 2001). Although the details of these programs differ somewhat, they share an emphasis on the application of behavior analytic principles within a comprehensive educational and treatment program aimed at improving the overall functioning of individuals with autism.

Lovaas evaluated his program in a widely cited study published in 1987, in which 19 children with autism received at least 40 hours per week of ABA, relative to 19 others who received less than 10 hours, and 21 additional children who received no specialized ABA intervention (Lovaas, 1987). The results were dramatic: After at least two years of the program, 47% of the group who received 40 or more hours per week achieved normal IQ scores, and were functioning in regular education settings; only one child from either of the control groups achieved this level of functioning. Lovaas described these children as having "recovered" from autism. In a follow up several years later, McEachin et al. (1993) found that the results were largely maintained; 8 of the 9 children with the best outcomes from the original study continued to function in regular education classrooms.

The Lovaas (1987) study, along with the follow up by McEachin et al. (1993), are frequently cited as providing evidence that ABA can effectively "cure" autism, at least in some children. Despite these apparently impressive results, several scholars have raised serious methodological concerns about the study (Gresham & MacMillan, 1998; Mesibov, 1993;

Mundy, 1993; Schopler, Short, & Mesibov, 1989). For example, the outcome measures may not reflect true changes in functioning. Changes in IQ could reflect increased compliance with testing rather than true changes in cognitive abilities, and school placement could have more to do with parent advocacy and evolving school policies than with actual functional changes. Several important domains of functioning (e.g., social skills, conceptual reasoning skills) were not assessed. In addition, there are indications that Lovaas' sample may have included relatively high functioning individuals with unusually good prognoses, and was therefore unrepresentative of children with autism in general. Most critically, the Lovaas study was not a true experiment, as participants were not randomly assigned to groups. The manner in which subjects were assigned to groups raises serious questions about the possibility of selection bias, which are underscored by pre-intervention differences between the experimental and control groups. These methodological weaknesses limit the conclusions that can be drawn from this hallmark study. Although the results are certainly promising, they are not probative with respect to the question of the effectiveness of ABA for autism.

Even if the Lovaas (1987) study did not have these methodological limitations, it alone would still be insufficient as a basis for claiming that ABA can result in recovery from autism. Replication of the findings by other independent investigators would be necessary. Such replication is especially critical when considering claims that contradict established conventional wisdom. In this context, it is noteworthy that attempts to replicate Lovaas' original results have consistently failed to demonstrate the dramatic results he reported (Anderson, Avery, DiPietro, Edwards, & Christian, 1987; Birnbrauer & Leach, 1993; Sheinkopf & Siegel, 1998). Although all three of these studies reported gains for some children, the degree of change was consistently much more modest than that reported by Lovaas. In addition, like the original study, none of these replications was a true experiment, and all

differed in significant ways from the original study.

In addition to the home-based, one-on-one ABA programs described above, similar school-based ABA programs have been developed and evaluated. Fenske, Zalenski, Krantz and McClannahan (1985) reported positive results with children younger than 60 months who received at least two years of ABA at the Princeton Child Development Institute. Harris, Handleman, Gordon, Kristoff, and Fuentes (1991) also demonstrated gains in a group of relatively high functioning children with autism following 10 to 11 months of intervention through the Douglas Developmental Center of Rutgers University. Again, however, the gains reported were significantly more modest than those reported by Lovaas (1987).

Like the original Lovaas study, none of these replication studies utilized an experimental design; in fact, some were purely descriptive, having no control condition of any kind. There were pretreatment differences between the experimental and control conditions in each of the studies that included a control condition, further limiting the conclusions that can be drawn from these data. This literature is marked by consistent methodological limitations, including limited outcome measures, questions about the representativeness of samples, and unknown treatment fidelity. In all fairness, the many difficulties in conducting controlled outcome research with this population must be acknowledged. Nevertheless, these obstacles are no excuse for exaggerating the results or implications of the existing research literature.

Proponents of ABA might acknowledge the absence of randomized controlled trials, but counter that single-case research justifies the bold claims of ABA's extraordinary effectiveness. Indeed, the field of behavior analysis has a long and noble tradition of employing single-subject research methods. Such methods may be extremely useful for suggesting hypotheses concerning controlling variables of target behaviors and for documenting treatment outcome in individual cases. Single-case methods are not without

limitations, however. They cannot rule out several threats to internal validity, and are generally unable to compare the effects of competing treatment conditions, especially programs like ABA for childhood autism in which the intervention requires a long period of time and effects are hypothesized to be irreversible. Then there is the obvious problem of generalizing the findings beyond the individual case studied. Thus, although single-subject studies may be informative, they alone cannot constitute evidence for ABA's ability to cure autism, or of ABA's unique superiority over alternative programs.

### EXAGGERATED CLAIMS

The research that has been conducted to date therefore suggests that ABA early intervention programs are promising in the treatment of childhood autism. They do not, however, support dramatic claims about "recovery" from autism and "normal functioning." In addition, it is especially important to note that no research has compared comprehensive ABA programs to other comprehensive early intervention programs for autism. Several alternative programs have been developed, and initial studies have yielded promising results (e.g., the LEAP program, Hoyson, Jamieson & Strain, 1984; Strain, Kohler, & Goldstein, 1996; the TEACCH program, Schopler & Reichler, 1971; the Denver Health Sciences Program, Rogers & DiLalla, 1991). The limited outcome research on these alternative approaches is plagued by many of the same problems as the outcome research on ABA. Nevertheless, the advocates of these approaches have generally been careful to avoid making exaggerated claims about their effectiveness.

Without experimental studies directly comparing ABA with alternative early intervention programs, one can have little confidence in any unique benefits of ABA for autism. In fact, it is possible that factors common to all of these programs (e.g., a highly supportive teaching environment, a curriculum that emphasizes certain specific skills), rather than any specific interventions per se, may



account for any gains observed (Dawson & Osterling, 1997). No component analysis studies have assessed this possibility.

The chasm between the extant empirical research on ABA programs for childhood autism and the dramatic claims sometimes made on behalf of these programs is inconsistent with the core value of empiricism that lies at the heart of behavior analysis. Such claims may ultimately serve to undermine both the public's and professionals' confidence in ABA for autism, as well as confidence in reports of the impressive results that ABA has produced in other areas. More importantly, such claims risk misleading parents, teachers, and other stakeholders about the likely prognosis for their autistic child, and about the full range of viable intervention options. Families of autistic children are understandably quite distraught over this disorder, and many will go to great lengths to provide any treatment that may offer hope of a cure. In addition to the high financial cost and the emotional stress often associated with a comprehensive ABA program, when their child fails to "recover" from autism, the family may feel guilty, believing that they somehow did not do enough. Providing families of children with autism false hopes about the chances of recovery may promote denial about the apparent lifelong nature of autism.

ABA is one of the most – if not the most – promising interventions for childhood autism, and controlled research evaluating its effects is desperately needed. Fortunately, efforts to replicate Lovaas' intervention program are underway (Smith, Donahoe, & Davis, 2001). Unfortunately, to our knowledge, no controlled studies are underway that compare a comprehensive ABA program with an alternative (e.g., TEACCH). Until and unless convincing data from independent, methodologically strong studies become available demonstrating that autistic children can in fact achieve normal functioning, behavior analysts should refrain from making such claims. In addition, until and unless data from well-designed experiments demonstrate the superiority of ABA over other comprehensive intervention programs, behavior analysts should

refrain from suggesting that ABA offers unique benefits over other programs. In keeping with the historical value that behavior analysis places on empiricism, it is incumbent on behavior analysts to keep their conclusions consistent with the data.

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