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Research to Practice

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Comprehensive Synthesis of Early Intensive Behavioral Interventions for Young Children with Autism Based on the UCLA Young Autism Project Model

Findings from special education studies at http://research.nichcy.org/

This is a structured abstract of a meta-analysis conducted by Brian Reichow and Mark Wolery. Full citation for this meta-analysis appears on page 4.

Abstract

A 3-part comprehensive synthesis of the early intensive behavioral intervention (EIBI) for young children with autism based on the University of California at Los Angeles Young Autism Project method (Lovaas in *Journal of Consulting and Clinical Psychology, 55,* 3–9, 1987) is presented. The three components of the synthesis were: (a) descriptive analyses, (b) effect size analyses, and (c) a meta-analysis.

The findings suggest EIBI is an effective treatment, on average, for children with autism. The conditions under which this finding applies and the limitations and cautions that must be taken into consideration when interpreting the results are discussed within the contextual findings of the moderator analyses conducted in the meta-analysis.

Background

In 1981, Dr. O. Ivar Lovaas, of the University of California at Los Angeles Young Autism Project, published a manual on how to implement a home-based model of early intensive behavioral intervention (EIBI) for young children with autism. Six years later, he reported that children who had received the EIBI described in his manual for approximately 40 hours a week over at least 2 years had increased their IQ scores by 31 points more than a control group. In addition, Dr. Lovaas claimed that almost half of the children who received EIBI in his study had "recovered." He defined recovery as obtaining an IQ score in the normal range (>85) and attending first grade in a regular education setting.

Dr. Lovaas was criticized by some other researchers both for his claims of children recovering from autism and for what they saw as methodological flaws in his study's design. Since 1987, the Lovaas study has been replicated by a number of other researchers with adjustments made to the study design to address the original criticisms. This synthesis uses both descriptive and statistical analyses to provide a comprehensive review of the studies on EIBI conducted in the 20 years since Lovaas' original study.

Research Questions

1. What is known to date about the experimental methods, participants, and program characteristics of early intensive behavioral intervention programs?
2. What is the effect of EIBI on participants' IQ scores?

Research Subjects

Young children with autism, autism spectrum disorder (ASD), pervasive developmental disorder (PDD),

or pervasive developmental disorder not otherwise specified (PDD-NOS) receiving EIBI.

Specified Disability

Of the children in the experimental/EIBI treatment groups, 86% were diagnosed with autism and 14% were diagnosed with ASD, PDD, or PDD-NOS. In the control groups, 79% of children were diagnosed with autism and 21% were diagnosed with ASD, PDD, or PDD-NOS.

Intervention

Children in the treatment groups of the studies included in this meta-analysis were provided with early intensive behavioral intervention (EIBI) for young children with autism based on the University of California at Los Angeles Young Autism Project method.

The researchers identified nine intervention characteristics that studies needed to be included in this review. The first three characteristics dealt with the intensity of the intervention; the second group of three characteristics pertained to organization of intervention services, and the final group described aspects of the therapy.

1. **Intervention density:** the total number of hours per week participants received EIBI.
2. **Intervention duration:** total number of months each participant received EIBI.
3. **Total hours of therapy:** calculated using the two previous characteristics (intervention density and duration). When the data for density and/or duration were not provided in a study, the researchers determined an estimated value to use in the analyses.
4. **The model of supervisor training:** Supervisor training was either categorized as being consistent with the original training protocol developed at UCLA, which included an internship at an affiliated clinic site (i.e., UCLA or MYAP), or as using another training model (e.g., inservice, on-the-job, workshop-based).
5. **Type of service coordination model:** Three service coordination models were considered (i.e., clinic-coordinated, community-coordinated, or parent-coordinated).
6. **Parental role:** This was defined by the type of involvement expected for each participant's parents (usually, the mother). These included conducting therapy, service-coordination, and assisting therapists.
7. **Educational and/or training qualifications of therapist:** Therapists could be parents, undergraduate college students, lay people, or paraprofessionals.
8. **Location of therapy across the intervention period:** Three locations were accepted (home, school, community).
9. **Physical aversives:** Use of physical aversives was recorded for each sample in the studies as either occurring, not occurring, or not reported.

Duration of Intervention

All EIBI interventions included in this synthesis were implemented for a year or more.

The hours per week of intervention that children received ranged from 18.7 to 40 hours, and the total

Research Design—Meta-analysis

Number of Studies—13

Number of Subjects—373

Years Spanned—1987-2007

Research Subjects—Young children with autism, autism spectrum disorder (ASD), pervasive developmental disorder (PDD), or pervasive developmental disorder not otherwise specified (PDD-NOS) receiving EIBI.

Age/Grade of Subjects—One of the inclusion criteria for studies in this review was that the participating children's mean chronological age was not more than 84 months (i.e., 7 years old). Most participants had a mean age of less than half the age cut-off (i.e., < 42 months or 3.5 years).

Specified Disability
Autism, ASD, PDD, or PDD-NOS.

Interventions
Early intensive behavioral intervention (EIBI) for young children with autism based on the University of California at Los Angeles Young Autism Project method.

number of hours of intervention that children received over the course of the studies ranged from 774 hours to 7,793 hours. Six of the studies reported that children received a minimum of 4,000 hours of therapy.

Effect Size

Effect size is a statistical calculation that indicates how much of an impact an intervention had on the children that received it. In this synthesis, effect size measured the impact of EIBI on young children with autism. The researchers used a conservative measure of effect size called Hedge's *g* in combination with several other meta-analytic techniques to conduct their analyses.

The overall mean effect size for EIBI on children's IQ scores was large (0.69), indicating that in general EIBI is an effective intervention for increasing the IQ scores of children with autism. The authors were careful to point out that, while the overall effect size for EIBI was strong, in studies where individual participants' data were reported, at least one child in each study failed to progress or regressed on some outcome measure. This indicates that, while EIBI may in *general* be an effective treatment, it may not be appropriate for all children.

Findings

Characteristics of the Studies Examined

Only two studies in this synthesis were true experimental design studies that used random assignment to place participants in the treatment or control group. Three studies placed children based on therapist availability, and five studies used parental selection. Little was known about the conditions in the comparison groups. Some studies simply reported that the treatments and conditions of children in the control group were "eclectic," making it difficult to compare the treatment effects between the children who received EIBI and the children who did not. While one of the requirements for inclusion in this synthesis was that studies based their treatment on one of Lovaas' manuals, the quality and consistency in how the therapy was provided were not measured well enough in any of the studies for a claim to be made about the fidelity of the therapy implementation.

Measures

The most frequently used measures of EIBI's effectiveness in these studies were severity of autistic symptoms (i.e., psychopathology, assessed in all 13 studies), IQ score (12 studies), adaptive behavior (9 studies), academic placement after EIBI treatment (9 studies), diagnostic reclassification (i.e., the recovery criteria suggested by Lovaas: post-intervention IQ score above 85 and completion of first grade in a regular classroom; 7 studies), and receptive and expressive language measures (6 studies).

The Effectiveness of EIBI

- Seven of the 13 studies reported how many children met Lovaas' criteria for diagnostic reclassification (post-intervention IQ score above 85 and completion of first grade in a regular classroom). Individual studies reported a range of diagnostic reclassifications; across all 7 studies, 18% of participants were reclassified after receiving EIBI.
- The majority of studies that examined the effectiveness of EIBI on improving IQ scores, adaptive behavior, and receptive and expressive language reported EIBI was effective at improving children's scores on these measures. However, across studies the effect sizes ranged from low to very high; in the case of IQ scores, there was one study that reported a small negative effect, meaning that children in the control group made slightly more improvement in their IQ scores than did children receiving EIBI.
- Overall, children receiving EIBI made more gains than children in the control groups. However, since none of the control groups consisted of children participating in another standardized autism treatment, no comparisons between the progress of children receiving EIBI and other well-known autism therapies can be made by this synthesis.
- Only 2 studies examined how the intensity of behavioral intervention (as measured by number of hours of therapy per week) affected IQ scores. Both studies suggested that higher numbers of hours of EIBI per week lead to higher IQ scores.
- Studies in which the supervisory personnel were trained according to the UCLA model were more likely to report larger changes in IQ scores.

Conclusions

The findings of this synthesis could be used to make claims about the effectiveness of EIBI, but the authors caution against reporting any of the findings without also acknowledging the limitations of these studies. While the results indicate that EIBI often led to an increase in children's IQ scores (especially when supervisory staff were trained using the UCLA model, the EIBI was conducted over a long duration, and the total hours of therapy were high), interpretation of these results is limited by the poorly defined control groups, the lack of comparisons to other research-based treatments, and the small number of studies.

Recommendations for Future Research

- Implement more true experimental design studies of EIBI. Use random assignment to place children in treatment or control groups.
- If possible, make sure that children in the comparison group are receiving the same alternative treatment to EIBI. Doing so would allow the effectiveness of EIBI to be compared with the effectiveness of other research-based autism interventions. If it is not possible to provide the same alternative therapy with comparison groups, at least provide a good description of the interventions being received by comparison groups.
- Measure procedural fidelity across children, therapists, and different conditions (e.g., home vs. center-based EIBI).
- Use appropriate diagnostic criteria. The criteria used to show children who received EIBI had "recovered" in Lovaas's study (i.e., a post-intervention IQ score above 85 and completion of first grade in a regular classroom) have been criticized since Lovaas first proposed them. IQ score is not a diagnostic criterion for autism, and a child's placement in school is based on a number of factors not related to the child's abilities (e.g., district policies, parental advocacy, teacher recommendations, etc.). The authors suggest that future research measures should focus on diagnostic evaluations of autism conducted by evaluators who are not aware of the children's previous diagnosis or their placement in either the experimental or control group.

Abstracted from—

Reichow, B., & Wolery, M. (2009). Comprehensive synthesis of early intensive behavioral interventions for young children with autism based on the UCLA Young Autism Project Model. *Journal of Autism and Developmental Disorders, 39*(1), 23-41.

Research Connections

Looking for more information on interventions for children with autism spectrum disorders? We're pleased to point you to these additional resources:

- Meta-Analysis of School-Based Social Skills Interventions for Children with ASD
  http://nichcy.org/research/summaries/abstract75
- Meta-Analysis of Video Modeling and Video Self-Modeling Interventions for Children and Adolescents with Autism Spectrum Disorders
  http://nichcy.org/research/summaries/abstract72
- The What Works Clearinghouse's Intervention Report on the Lovaas Model of Applied Behavior Analysis
  http://ies.ed.gov/ncee/wwc/interventionreport.aspx?sid=295

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