Comprehensive synthesis of early intensive behavioral interventions for young children with autism based on the UCLA young autism project model

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CRD summary
This review found that early intensive behavioural interventions were on average an effective treatment for children with autism, but the authors advised caution in interpreting the results due to gaps and limitations in the evidence base. The authors’ cautious conclusions appear to be justified.

Authors' objectives
To synthesise the studies on early intensive behavioural interventions based on the University of California at Los Angeles Young Autism Project model for young children with autism

Searching
The authors searched MEDLINE and PsycINFO for peer reviewed English-language studies. Search dates and terms were not reported. The authors examined references from review articles on comprehensive early intervention programmes for children with autism and consulted eligible reports. Selected journals (not specified) were handsearched and experts were contacted.

Study selection
Eligible studies needed to include an early intensive behavioural intervention (EIBI) based on the University of California at Los Angeles (UCLA) Young Autism Project model. Participants needed to have a diagnosis of autistic disorder, autism spectrum disorder (ASD), pervasive development disorder (PDD) or pervasive developmental disorder not otherwise specified (PDD-NOS). Participants had to have a mean chronological age of less than 84 months at the beginning of treatment. Mean duration of EIBI should be greater than or equal to 12 months and at least one child outcome should be reported. Studies needed to be of an experimental or quasi-experimental design.

Half of the studies focused on participants with autism and half included participants with allied diagnoses. Most of the children were less than 42 months old. There was a wide range of mean IQ scores (28 to 83). Differences existed in all characteristics of intervention across studies (including intensity, duration, organisational, personnel and setting). The range of the total number of hours of therapy was 774 to 7,793. Across the comparative studies, comparators included: different intensities of behavioural intervention; other treatments such as treatment as usual, eclectic treatment and specialist nursery schools; and different service coordination models. Where reported, some studies reported that greater than 80% of the participants received supplemental treatments.

The authors stated neither how studies were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
The authors analysed five methodological aspects of each included study: an overall rating of experimental rigour using a method devised by one of the reviewers (strong, adequate or weak); categorisation of study design; method used for group assignment; procedural fidelity (encompassed fidelity of treatment adherence, differentiation of treatment between experimental group and controls, and therapist competence); and measurement constructs used. The authors did not state how the validity assessment was performed.

Data extraction
Study characteristics were coded using a manual and specially created forms. For each study, research methods, participant characteristics and intervention characteristics were defined and coded. Outcome data were coded for both samples that received EIBI and for comparisons between groups that received EIBI and non-EIBI groups. The authors calculated effect sizes for outcome data for the constructs of IQ, adaptive behaviour, expressive language and receptive language. All coded data were obtained directly from reports or via contact with a study researcher. Two independent reviewers extracted the data. Interobserver agreement was assessed on 29% of the reports.
Methods of synthesis
The authors used three methods of synthesis: descriptive analysis; effect size analysis and a meta-analysis. Where it was not possible or was inappropriate to calculate an effect size, descriptive analyses were used. The standardised mean change effect size and the standardised mean difference effect size were used as appropriate. Such effect sizes were calculated only when data were available and no data were extrapolated. Hedge's g was used as the effect size metric and small sample correction factors were applied. The meta-analysis involved calculation of the mean effect size weighted by the inverse of a study's variance. Publication bias was assessed using the Duval and Tweedie Trim and Fill method. Statistical heterogeneity was assessed by Q and I^2 statistics. Analyses of potential moderating variables defined a priori were conducted.

Results of the review
Fourteen samples from 13 research reports were included in the review (n=373): three single group pre-post design and 10 comparative studies of a retrospective or prospective design. Three studies were rated strong, five adequate and five weak. Only two studies used random assignment to groups. Overall, the studies provided only limited details of comparison groups that varied across and within the studies. Procedural fidelity results were mixed. All samples used measures to ensure or document treatment adherence. Six of the 10 comparative studies measured treatment differentiation using indirect measures. Therapist competence was measured in 10 of 13 studies and assessed by indirect methods in seven studies. Across the studies, multiple constructs were assessed with multiple measures and measurement methods.

Analyses of the effects of EIBI for placement, psychopathology and diagnostic reclassification supported the conclusion that EIBI was an effective intervention for many children with autism. The generally positive effect sizes suggested that post-intervention performance was on average higher than pre-intervention on multiple dimensions of functioning. Between-group analyses of comparative studies suggested that children who received EIBI made more gains than children who received minimal behavioural intervention, eclectic treatment or treatment as usual. Further details of results of effect size comparisons were available in the report. Meta-analysis using a random-effects model gave a mean effect size of 0.69 (p=0.001) for the increase of participants’ IQ scores. There was some evidence of publication bias. There was evidence of statistical heterogeneity (I^2=51.2), which was examined in moderator analyses. These analyses found that study rigour and assignment to group did not have a statistically significant relation to changes in IQ. The only variable with a statistically significant relation to change in IQ was supervisor training model (B=0.62, p = 0.01).

Authors' conclusions
The review findings suggested that EIBI was on average an effective treatment for children with autism. Caution was advised in interpreting the results due to gaps and limitations in the evidence base.

CRD commentary
This review had defined inclusion criteria for participants and intervention and broadly defined criteria for study designs and outcomes. Searching was based on only two databases, but was supplemented by other methods. The review did not include unpublished research. The authors found some evidence of publication bias, which could impact on overall effect size. The review was limited to the English language, but as the intervention was based on a US model this may be less important. Validity was assessed and results presented in the context of quality. The types of synthesis used appeared to be appropriate. Heterogeneity found in meta-analysis was further explored with moderator variables. Such analysis of moderator variables suggested pointers for further research. It was unclear whether more than one reviewer was involved in the review processes of study selection and validity assessment in order to limit bias and error. However, the authors' cautious conclusions appear to be justified.

Implications of the review for practice and research
Practice: EIBI can be an effective intervention for some children with autism, but it was not an intervention that met the needs of all children with autism. It was imperative that children who received EIBI were monitored and those who did not respond to the intervention were identified early so that additional and/or different treatments could begin.

Research: Future studies should use random assignment to groups, provide clear detail of comparison group interventions and measure procedural fidelity directly across participants, therapists and conditions. Future research on EIBI should supplement standardised measures with observational data of children's functional performance on key...
variables in natural settings. Academic placement should not be used as an indication of intervention effectiveness in future studies. Diagnostic evaluations should include diagnostic instruments for autism and should be conducted by qualified individuals who were blind to a participant's earlier diagnosis and experimental group membership. Future research on the minimum number of hours and the minimum length of time needed for participants to achieve desirable outcomes was needed. Future analyses of EIBI should continue to quantify the relationship of intervention characteristics (components) to outcome.

**Funding**
The US Department of Education Office of Special Education through an ESCE Doctoral Leadership Training Grant (H325D030012).

**Bibliographic details**

**PubMedID**
18535894

**DOI**
10.1007/s10803-008-0596-0

**Original Paper URL**
http://www.springerlink.com/content/k138457075p645l2/

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Asperger Syndrome /diagnosis /psychology /therapy; Autistic Disorder /diagnosis /psychology /therapy; Behavior Therapy /methods; Child; Child Development Disorders, Pervasive /diagnosis /psychology /therapy; Child, Preschool; Early Intervention (Education); Follow-Up Studies; Humans; Infant; Intelligence; Models, Educational; Outcome Assessment (Health Care); Social Behavior

**AccessionNumber**
12009102547

**Date bibliographic record published**
27/05/2009

**Date abstract record published**
28/10/2009

**Record Status**
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.