

# WWC EVIDENCE REVIEW PROTOCOL: INTERVENTIONS FOR CHILDREN WITH AN AUTISM SPECTRUM DISORDER

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## Topic Area Focus

This What Works Clearinghouse (WWC) review focuses on interventions designed to improve the academic, behavioral, communication, intellectual, social, and emotional outcomes of children and students described as having a disability within the category of autism spectrum disorders (ASD). Autism spectrum disorders encompass a number of diagnoses and descriptions, including autism, autistic disorder, Asperger’s syndrome, Rett’s disorder, Pervasive Developmental Disorder (PDD), PDD Not Otherwise Specified (PDD-NOS), and others. The relevant age span for this review is 2 to 21, and the intended audience is educators and early childhood interventionists working in child care, preschool, and K–12 settings who have an interest in serving children or students with an ASD. Interventions may have been evaluated in clinic and home settings, as well as educational environments such as preschools and elementary and secondary schools; however, all interventions that will be reviewed must be able to be used by personnel serving in educational capacities, such as teachers and early interventionists.

Systematic reviews of evidence in this topic area address the following questions:

- Which interventions are effective in improving the academic, behavioral, communication, intellectual, social and/or emotional outcomes of children and students classified as having an ASD?
- Are some interventions more effective than others for children and students classified as ASD?
- Are some interventions more effective with particular age groups or for those who have different levels of severity?

Intervention-level reports will describe subgroup analyses (based on age, gender, socioeconomic status, race/ethnicity, English language learner status, severity of disability, and the setting in which the intervention was delivered), evidence regarding the immediacy and durability of effects, and whether interventions entailed single or multiple elements. We also will describe authors’ attempts to establish intervention fidelity should they discuss it, using their descriptions and conclusions while making clear that the review is forming no judgment about these data.

## Key Definitions

**Autism Spectrum Disorder.** Under the Individuals with Disabilities Education Act (IDEA), an ASD is defined as “a developmental disability significantly affecting verbal and nonverbal communication and social interaction, usually evident before age 3 that adversely affects a child’s educational performance. Other characteristics often associated with ASD are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences. The term does

not apply if a child's educational performance is adversely affected because the child has an emotional disturbance" [34 C.F.R. 300.8(c)(1)].

Autism spectrum disorder refers to the full range of specific diagnoses and descriptors associated with the key characteristics of autism. These include autistic disorder, Asperger's syndrome, Rett's disorder, Pervasive Developmental Disorder, and Pervasive Developmental Disorder Not Otherwise Specified.

**Outcome Domains.** The relevant classes of outcomes for this review shall focus on the following needs of children and students identified with an ASD:

- Academic
- Behavioral
- Communication
- Intellectual
- Social
- Emotional

## GENERAL INCLUSION CRITERIA

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### Populations to Be Included

The population of interest includes young children and special education students between the ages of 2 and 21 who are identified as having an ASD. Participants may be studied in any setting (e.g., child care, preschool, school, home, community, work site) as long as the interventions being examined meet the criteria described below.

If the sample includes children with an ASD *and* those without an ASD, reviewers will determine if ASD subsample analyses were conducted. If subsample analyses are mentioned in the report and are available (via either the report or author query), the ASD subsample will be included in the review. If subsample analyses are not conducted, a study's aggregated sample will be reviewed if it meets the requirements for sample relevance (as described below) and if the intervention has a clear focus on meeting the needs of students with an ASD.

Children must reside in the United States, its territories, or tribal entities. Both children who speak English and those who are English language learners will be included in reviews.

### Types of Interventions to Be Included

This review encompasses research on interventions that aim to improve the functioning of children and students with an ASD. These interventions may take place in a school or center-based setting or in other locations (such as clinical settings or family homes), but they must be applicable for use by school personnel.

The types of interventions that are eligible for the review include specific practices documented in the literature. A *practice* is a named approach that staff or researchers implement in the classroom, home, clinic, or community setting. The named approach must be clearly described, commonly understood and used in published works by more than one investigator or team of investigators. Several terms may be used in the literature to refer to the same practice. It also is possible for a named practice to refer to an array of specific procedures. Interventions in which parents implement a curriculum, practice, or therapy with their child, either at home or in an educational setting, are eligible for the review if 1) the parents are implementing the intervention under the direction of a school, preschool, or program funded through IDEA or 2) the parents are implementing a curriculum, practice, or therapy with their child under the direction of a researcher, provided the intervention could be administered by personnel serving in educational capacities.

In order for a study to be reviewed, the intervention tested must be replicable in that the research report must document the following elements: target population, characteristics of settings in which it was implemented, specification of key features or components of the intervention, and characteristics of the intervention duration and intensity.

The review will document reported intervention fidelity. That is, it will describe what authors present regarding fidelity. It will not consider fidelity if it is not discussed in study reports. Because the review only is summarizing study statements of how fidelity was assessed and the

degree to which fidelity was achieved, it will make no judgments about the quality of fidelity data or related analyses and interpretations. On a related point, we will discuss whether interventions were carried out by typical school staff or by researchers.

Interventions that include medication or other biomedical practices are excluded.

## **Types of Research Studies to Be Included**

To be included in the review, a research study must meet the following relevancy criteria:

**Topic relevance.** A study must include outcomes associated with developmental functioning, including outcomes related to intellectual, academic, behavioral, communication, social, and emotional functioning. The study must focus on the effects of an intervention, not on individual differences (e.g., correlational studies examining the relationship between individual attributes and performance on a test, or studies focusing on brain functions or structures) or on assessment (e.g., properties of an instrument or approaches to identifying children with an ASD).

**Time frame relevance.** As per WWC convention, to be reviewed as evidence, the study must have been publicly released in the 20 years prior to the initiation of this Topic Area, i.e. 1990 or later, and obtained by the WWC prior to drafting the intervention report. This time frame was established in order to define a realistic scope of work for the review. Intervention reports will cite foundational studies published prior to 1990 in the reference list.

**Sample relevance.** The study has to satisfy several sample-related criteria:

- The intervention must have occurred when children were between ages 2 and 21 and the outcomes must be measured prior to age 21. Studies based entirely on a sample of children with an ASD will be included. Studies based on a mix of children with an ASD and other children will be included using results for the subsample of children with an ASD if outcomes are reported separately OR using the full sample results if at least 50% of the study sample is composed of children with an ASD. In these studies, the intervention and comparison groups must include a similar percentage of children with an ASD (the difference must be less than 0.25 of a standard deviation, using the standard deviation of the pooled sample).
- Studies that focus on outcomes for children with an ASD who are also English language learners will be included in the review (only outcomes measured in English will be reported—see below).
- Studies will be included if they report that the study population is children with an ASD who were identified through evaluation by the - special education system (IDEA), by a medical evaluation, by direct assessment of the child by researchers, or by administration of a standardized, diagnostic protocol by a parent or teacher. Studies will not be included if children are identified as having an ASD solely on a parent or teacher report.

- If an intervention is known to be designed for children with an ASD, but the study does not identify the population as children with an ASD, information about the study population will be requested from the study authors.

***Study design relevance.*** Only empirical studies that use quantitative methods and inferential statistical analysis and that take the form of a randomized controlled trial (RCT) or use a quasi-experimental design (QED), a regression-discontinuity design (RD), or a single-case experimental design (SCD) are eligible for this review.

***Outcome relevance.*** Studies in this topic area will focus on academic, behavioral, communication, intellectual, social, and emotional outcomes for children and students with an ASD, rather than on teacher or other outcomes, and they must include at least one relevant outcome for which adequate content validity and reliability (as defined below) have been demonstrated. Studies that focus on outcomes measured in languages other than English are excluded.

## **SPECIFIC TOPIC PARAMETERS**

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The following parameters specify which studies are considered for analyses and which aspects of those studies are coded for the review.

### **Reliability and validity of outcome measures**

The study must include at least one child outcome measure with evidence of face validity and for outcomes that are tests or scales, sufficient score reliability assessed using the following standards determined by the WWC. If the score reliability of each outcome measure is not specified in the research article, data from the test's or scale's publisher or other sources may be used to establish the score reliability of an outcome measure for the study population. If studies did not analyze the score reliability of outcome measures using study data, and analyses by test publishers or other researchers did not include children with disabilities, any other available evidence of score reliability and validity of the measure for the study population will be considered, and a decision about the adequacy of the outcome measure will be made on a case-by-case basis in consultation with experts.

For group-design studies:

- Internal consistency score reliability: minimum of 0.60
- Temporal stability/test-retest score reliability: minimum of 0.40
- Inter-rater score reliability for RCT and QED study outcomes that are not standardized tests: minimum of 0.50

For single-case design studies:

- Inter-assessor agreement: minimum of 0.80 as measured by percentage of agreement or 0.60 as measured by Cohen's kappa
- The study must collect inter-assessor agreement for each case on each outcome variable at least once in each phase and for at least 20% of sessions in each condition (e.g., 20% of baseline sessions and 20% of intervention sessions).

If an outcome measure is composed of different tests for different children in the sample, it will be considered a valid outcome if the following criteria are met:

- The tests purport to measure a similar construct and were standardized on a similar population, as reflected in the test manual or empirical studies focused on the test.
- The tests must meet the thresholds for reliability described above.
- There must be clear rules for which test is administered to which child or student, and the rules must be applied in the same way to the treatment and control groups.
- The distribution of tests administered at baseline to the treatment and control groups must be similar.

If information necessary to apply these criteria is not available in the article, an author query will be initiated to obtain the information.

### **Effectiveness of the intervention across subgroups of children or students**

An intervention's effectiveness is likely to vary among children and students with different characteristics, and a study that tests the effectiveness of an intervention may examine the effects of the intervention for important subgroups. For studies of interventions for children with an ASD, important subgroups include the following:

- Age
- Gender
- Socioeconomic status
- Race/ethnicity
- English language learner status
- Severity of intellectual and communicative disability

When a study that meets WWC evidence standards reports intervention effects for these subgroups and the subgroup analyses meet all of the WWC standards required for the full sample results, subgroup findings will be included in an appendix to the intervention report.

### **Effectiveness of the intervention across settings**

A study that seeks to test the effectiveness of an intervention might examine effects across different settings. For studies of interventions for children and students with an ASD, these settings might be defined by the following:

- Location (urban, suburban, or rural)
- Setting (child care center, clinic, prekindergarten, school, classroom, Head Start, workshop, home)
- Type of setting (segregated, inclusive)
- Staff education, qualifications, or training (e.g., certification, years of experience)

When a study that meets WWC evidence standards reports intervention effects separately for these settings and the analyses of results by setting meet all of the WWC standards required for the full sample results, these analyses will be included in an appendix to the intervention report.

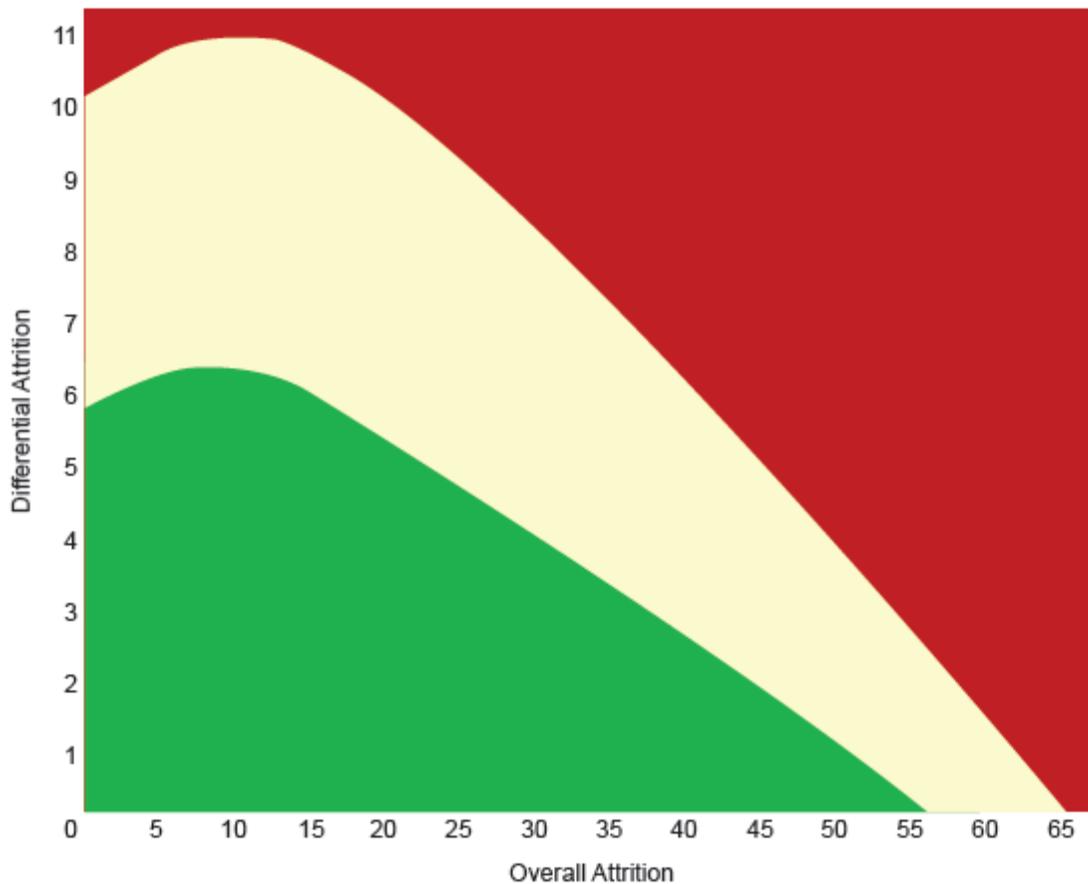
### **Attrition in RCTs and RDs**

As described in the *WWC Procedures and Standards Handbook (version 2.0)*, the WWC is concerned about overall and differential attrition from the intervention and comparison groups for RCTs, as both contribute to the potential bias of the estimated effect of an intervention. The

attrition bias model developed by the WWC will be used in determining whether a study meets WWC evidence standards (see Appendix A of the *Handbook*).

When the combination of overall and differential attrition rates causes an RCT study to meet the liberal attrition standard (illustrated heuristically by the green and white areas on the diagram shown below), the attrition will be considered “low” and the level of bias acceptable. This reflects the assumption that most attrition in studies of intellectual disability interventions for children with disabilities is due to exogenous factors, such as parent mobility and absences on the days that assessments are conducted. However, for RCTs with combinations of overall and differential attrition rates in the red area, the attrition will be considered “high” with potentially high levels of bias and, therefore, must demonstrate equivalence.

Many studies reviewed by the WWC are based on designs with multiple levels. Bias can be generated not only from the loss of clusters (such as schools), but also from sample members within the clusters (such as students), if those sample members attrit due to their treatment status. The attrition standard applies to both levels. To meet the standard, a study must first pass at the cluster level, using the designated attrition boundary. Second, the study must pass at the subcluster level, using the same attrition boundary, *with attrition based only on the clusters still in the sample*. That is, the denominator for the subcluster attrition calculation includes only sample members at schools or classrooms that remain in the study after cluster attrition.



**Highest Level of Differential Attrition Allowable to Meet the Attrition Standard Under the Liberal Attrition Standard**

Overall Attrition	Allowable Differential Attrition	Overall Attrition	Allowable Differential Attrition
0	10.0	34	7.4
1	10.1	35	7.2
2	10.2	36	7.0
3	10.3	37	6.7
4	10.4	38	6.5
5	10.5	39	6.3
6	10.7	40	6.0
7	10.8	41	5.8
8	10.9	42	5.6
9	10.9	43	5.3
10	10.9	44	5.1
11	10.9	45	4.9
12	10.9	46	4.6
13	10.8	47	4.4
14	10.8	48	4.2
15	10.7	49	3.9
16	10.6	50	3.7
17	10.5	51	3.5
18	10.3	52	3.2
19	10.2	53	3.0
20	10.0	54	2.8
21	9.9	55	2.6
22	9.7	56	2.3
23	9.5	57	2.1
24	9.4	58	1.9
25	9.2	59	1.6
26	9.0	60	1.4
27	8.8	61	1.1
28	8.6	62	0.9
29	8.4	63	0.7
30	8.2	64	0.5
31	8.0	65	0.3
32	7.8	66	0.0
33	7.6	67	-

## **Group equivalence in RCTs/RDs with high attrition and in QEDs**

If the study design is a RCT or RD with high levels of attrition or a QED, the study must demonstrate baseline equivalence of the intervention and comparison groups for the analytic sample. The onus for demonstrating equivalence in these studies rests with the authors.

Sufficient reporting of pre-intervention data should be included in the study report (or obtained from the study authors) to allow the review team to draw conclusions about the equivalence of the intervention and comparison groups. Pre-intervention characteristics can include the outcome measure(s) administered prior to the intervention or other measures that are not the same as, but are highly related to, the outcome measure(s).

For this topic area, it is possible for a study to meet evidence standards in one or more domains and not in others. Thus, rules for establishing baseline equivalence should be applied *within each domain*.

Groups are considered equivalent if the reported differences in pre-intervention characteristics of the groups are less than or equal to one-quarter of the pooled standard deviation in the sample, regardless of statistical significance. However, if differences are greater than 0.05 standard deviations and less than or equal to one-quarter of the pooled standard deviation in the sample, the analysis must control analytically for the individual-level pre-intervention characteristic(s) on which the groups differ. If pre-intervention differences are greater than 0.25 for *any* of the listed characteristics below, the study does not meet standards.

Given the potential for selection bias in QEDs, the possibility that the intervention and comparison groups were drawn from different populations also is a concern. Fundamental differences in the settings from which the intervention and comparison groups in a QED study were drawn and baseline differences in the characteristics of the intervention and comparison groups may indicate that the children in the two groups were drawn from different populations, even if they are equivalent on pretest measures. Statistically significant or large (half a standard deviation or more) differences in the characteristics and settings of children in the intervention and comparison groups are evidence that the groups were drawn from different populations, and the study would not meet WWC evidence standards. Important characteristics and settings to consider when they are reported include the following:

- Percentage of children and students with an ASD
- Percentage of children and students with a specific type or severity of ASD
- Percentage of children and students with an Individualized Education Program (IEP) or Individualized Family Service Plan (IFSP)
- Percentage of children and students from specific program settings, such as Head Start, school-based programs, and homes
- Percentage of children and students from low socioeconomic status (SES) families

## **Statistical and analytical issues**

RCT studies with low attrition do not need to use statistical controls in the analysis, although statistical adjustment for well-implemented RCTs is permissible and can help generate more precise effect-size estimates. For RCTs, the effect-size estimates will be adjusted for differences in pre-intervention characteristics at baseline (if available) using a difference-in-differences method if the authors did not adjust for pretest (see Appendix B of the *Handbook*). Beyond the pre-intervention characteristics required by the equivalence standard, statistical adjustment can be made for other measures in the analysis as well, although they are not required.

For the WWC review, the preference is to report on and calculate effect sizes for post-intervention means adjusted for the pre-intervention measure. If a study reports both unadjusted and adjusted post-intervention means, the WWC review will report the adjusted means and unadjusted standard deviations. If adjusted post-intervention means are not reported, they will be requested from the authors.

The statistical significance of group differences will be recalculated if (a) the study authors did not calculate statistical significance, (b) the study authors did not account for clustering when there is a mismatch between the unit of assignment and unit of analysis, or (c) the study authors did not account for multiple comparisons when appropriate. Otherwise, the review team will accept the calculations provided in the study.

When a misaligned analysis is reported (i.e., the unit of analysis is not the same as the unit of assignment) and the authors are not able to provide a corrected analysis, the effect sizes computed by the WWC will incorporate a statistical adjustment for clustering. The default intra-class correlations used for this review are 0.20 for academic and intellectual outcomes and 0.10 for behavioral, communication, and social-emotional development outcomes. For an explanation about the clustering correction, see Appendix C of the *Handbook*.

When multiple comparisons are made (i.e., multiple outcome measures are assessed within an outcome domain in one study) and not accounted for by the authors, the WWC accounts for this multiplicity by adjusting the reported statistical significance of the effect using the Benjamini-Hochberg correction. See Appendix D of the *Handbook* for the formulas the WWC uses to adjust for multiple comparisons.

All standards apply to overall findings as well as analyses of subsamples.

## **Statistical and analytical issues for SCDs**

The following criteria apply to the inclusion of single-case design research:

- The independent variable (i.e., the intervention) must be systematically manipulated, with the researcher determining when and how the independent variable conditions change.
- The outcome variable must be measured systematically over time by more than one assessor, and the study needs to collect inter-assessor agreement in all phases and at

least 20% of all sessions (total across phases) for a condition (e.g., baseline, intervention).

- The study must include at least three attempts to demonstrate an intervention effect at three different points in time or with three different phase repetitions.
- For a phase to qualify as an attempt to demonstrate an effect that meets evidence standards, the phase must have a minimum of five data points.
- For a phase to qualify as an attempt to demonstrate an effect that meets evidence standards with reservations, the phase must have a minimum of three data points.
- For the purposes of this review, there may be occasions when fewer than three data points in a phase would not automatically require the study to be rated as “not meeting standards.” Possible exceptions include the following:
  - Interventions for severe problem behavior such as aggression and self-injury in which extended initial baselines or reversal conditions pose serious ethical and procedural concerns.
  - Interventions on “zero baseline” behaviors for which there is no logical reason to conceive that further assessment would yield other than zero baseline performance. An example of such a zero baseline performance may be when a child is asked to provide a verbal label for an object (“what is this?”) and consistently provides no response to the request because the child has little to no language and has never been observed to label the item or similar items. In such cases, a multiple probe design may be used to alleviate potential “punishing” effects of repeated failure experiences.

## LITERATURE SEARCH METHODOLOGY

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The literature search strategy for the WWC evidence review for children with an ASD is two pronged. First, the review team will conduct a keyword search to identify interventions with studies that may be eligible for review. Then, the team will conduct focused intervention searches to ensure that all potentially eligible studies of the identified interventions are found. Each type of search is described below.

### Keyword Search

**Objective:** To identify interventions with potentially eligible studies and assess the likely number of studies on each intervention, so that interventions can be prioritized for review. The focus will be on breadth rather than depth. Subsequent searches will focus on the selected interventions and be designed to capture *all* potentially eligible studies, including any that the keyword search did not identify.

**Search Strategy:** The following keywords are meant to capture literature that falls within the scope of the protocol. Given the objective stated above, targeted outcomes and study design terms are included to focus the search on identifying literature that will support an intervention report. The keyword list is followed by a list of databases that are searched.

### Keyword List

#### Target Disability:

ASD OR  
Asperger OR  
Autis\* OR  
CDD OR  
Childhood Disintegrative Disorder OR

PDD\* OR  
Pervasive Developmental Disorder OR  
Rett OR  
Spectrum Disorder\*

AND

#### Interventions:

Intervention\* OR  
Curricul\* OR  
Program\* OR  
Strateg\* OR  
Instruct\* OR  
Teach\* OR  
Train\* OR  
Technique\* OR  
Therap\* OR  
Approach\*OR  
Pivotal response OR  
Natural language paradigm OR  
Video-modeling OR  
Functional communication training OR

Observational learning OR  
In vivo modeling OR  
Peer modeling OR  
Naturalistic instruction OR  
Natural environment training OR  
Precision teaching OR  
Mand-model procedure OR  
Time-delay procedure OR  
Behavior chain interruption OR  
Shaping OR  
Chaining OR  
Milieu teaching OR  
Antecedent OR  
Stimulus control OR

Function-based intervention OR  
Assessment-based intervention OR  
Incidental teaching OR  
Autism support services OR  
Facilitated communication OR  
Picture exchange communication OR  
Augmentative communication OR  
Alternative communication OR

Self-monitoring OR  
Self-management OR  
Choice making OR  
Social stor\* OR  
Peer mediated OR  
Interspersal OR  
Task variation OR

AND

**Study Design:**

Control group OR  
Comparison group OR  
Matched groups OR  
Treatment OR  
Random\* OR  
Assignment OR  
Baseline OR  
Experiment OR  
Evaluation OR  
Impact OR  
Effectiveness OR  
Causal OR  
Posttest OR  
Pretest OR  
Randomized Control Trial OR  
RCT OR  
Quasi-experimental Design OR

QED OR  
Regression discontinuity design OR  
RDD OR  
Changing criterion design OR  
Intrasubject replication design OR  
Multiple baseline design OR  
Multi-element design OR  
Multiple probe design OR  
Single case design OR  
Single subject design OR  
ABAB design OR  
Alternating treatment OR  
Simultaneous treatment OR  
Meta-analysis OR  
Meta analysis OR  
Reversal design OR  
Withdrawal design

**Databases:** The core list of electronic databases that are searched across topics includes the following:

**ERIC.** Funded by the U.S. Department of Education (ED), ERIC is a nationwide information network that acquires, catalogs, summarizes, and provides access to education information from all sources. All ED publications are included in its inventory.

**PsycINFO.** PsycINFO contains more than 1.8 million citations and summaries of journal articles, book chapters, books, dissertations, and technical reports, all in the field of psychology. Journal coverage, which dates back to the 1800s, includes international material selected from more than 1,700 periodicals in more than 30 languages. More than 60,000 records are added each year.

**Campbell Collaboration.** C2-SPECTR (Social, Psychological, Educational, and Criminological Trials Register) is a registry of more than 10,000 randomized and possibly randomized trials in education, social work and welfare, and criminal justice.

***Dissertation Abstracts.*** As described by Dialog, Dissertation Abstracts is a definitive subject, title, and author guide to virtually every American dissertation accepted at an accredited institution since 1861. Selected master's theses have been included since 1962. In addition, since 1988, the database has included citations for dissertations from 50 British universities that have been collected by and filmed at the British Document Supply Centre. Beginning with *Dissertation Abstracts International*, Volume 49, Number 2 (Spring 1988), citations and abstracts from Section C, Worldwide Dissertations (formerly European Dissertations) have been included in the file. Abstracts are included for doctoral records from July 1980 (*Dissertation Abstracts International*, Volume 41, Number 1) to the present. Abstracts are included for master's theses from spring 1988 (*Masters Abstracts*, Volume 26, Number 1) to the present.

***Academic Search Premier.*** This multidisciplinary database provides full text for more than 4,500 journals, including full text for more than 3,700 peer-reviewed titles. PDF backfiles to 1975 or further are available for well over 100 journals, and searchable cited references are provided for more than 1,000 titles.

***EconLit.*** EconLit, the American Economic Association's electronic database, is the world's foremost source of references to economics literature. The database contains more than 785,000 records from 1969 to the present. EconLit covers virtually every area related to economics.

***Business Source Corporate.*** Business Source Corporate contains full text from nearly 3,000 quality business and economics magazines and journals (including full text of many articles only abstracted in other sources we search). Information in this database dates as far back as 1965.

***SocINDEX with Full Text.*** SocINDEX with Full Text is the world's most comprehensive and highest quality sociology research database. The database features more than 1,986,000 records with subject headings from a 19,600+ term sociological thesaurus designed by subject experts and expert lexicographers. SocINDEX with Full Text contains full text for 708 journals dating back to 1908. This database also includes full text for more than 780 books and monographs and full text for 9,333 conference papers.

***EJS E-Journals.*** Electronic journals from EBSCO host® provide article-level access for thousands of electronic journals available through EBSCO's Electronic Journal Service (EJS). This resource covers Mathematica's journal subscriptions.

***Education Research Complete.*** Education Research Complete is the definitive online resource for education research. Topics covered include all levels of education, from early childhood to higher education, and all educational specialties, such as multilingual education, health education, and testing. Education Research Complete provides indexing and abstracts for more than 1,840 journals as well as full text for more than 950 journals, and it includes full text for more than 81 books and monographs and for numerous education-related conference papers.

***WorldCat.*** WorldCat is the world's largest network of library content and services and allows users to simultaneously search the catalogs of more than 10,000 libraries, containing more than 1.2 billion books, dissertations, articles, CDs, and other media.

***Cochrane Central Register of Controlled Trials.*** The Cochrane Central Register of Controlled Trials is a bibliography of controlled trials identified by contributors to the Cochrane Collaboration and others; it is part of an international effort to hand-search the world's journals and to create an unbiased source of data for systematic reviews.

***Cochrane Database of Systematic Reviews.*** Cochrane Database of Systematic Reviews contains full-text articles, as well as protocols focusing on the effects of health care. Data are evidence-based medicine and often are combined statistically (with meta-analysis) to increase the power of the findings of numerous studies, each too small to produce reliable results individually.

***Database of Abstracts of Reviews of Effects.*** Database of Abstracts of Reviews of Effects (DARE) includes abstracts of published systematic reviews on the effects of health care from around the world that have been critically analyzed according to a high standard of criteria. This database provides access to quality reviews in subjects for which a Cochrane review may not yet exist.

***Cochrane Methodology Register.*** The Cochrane Methodology Register (CMR) is a bibliography of publications that reports on methods used in the conduct of controlled trials. It includes journal articles, books, and conference proceedings; these articles are taken from the Medline database and from hand searches. The database contains studies of methods used in reviews and more general methodological studies that could be relevant to anyone preparing systematic reviews. CMR records contain the title of the article, information on where it was published (bibliographic details), and in some cases a summary of the article. CMR is produced by the UK Cochrane Centre on behalf of the Cochrane Methodology Review Group.

***CINAHL with Full Text.*** The Cumulative Index to Nursing and Allied Health Literature (CINAHL) with Full Text is the world's most comprehensive source of full text for nursing and allied health journals, providing full text for more than 600 journals indexed in CINAHL. This authoritative file contains full text for many of the most used journals in the CINAHL index with no embargo. Full-text coverage dates back to 1981.

***Medline.*** Medline covers the international literature on biomedicine, including the allied health fields and the biological and physical sciences, humanities, and information science as they relate to medicine and health care. Information is indexed from approximately 3,900 journals published worldwide.

**Additional Sources:** In addition to the keyword search, the review team seeks to identify other relevant studies through the following approaches:

- Public submissions
  - Materials submitted via the WWC website
  - Materials submitted directly to WWC staff
- Solicitations made to key researchers by the review team

- Checking websites summarizing research on programs for children and youth, prior reviews, and research syntheses (i.e., using the reference lists of prior reviews and research syntheses to make sure key studies have not been omitted)
- Searches of the websites of all the developers of relevant interventions or practices for any research or implementation reports
- Searches of the websites of more than 50 think tanks, research centers, and associations that conduct research in this topic area
- Published meta-analyses, such as the National Standards Project report from the National Autism Center

References resulting from these searches will be screened and sorted by intervention. The list of websites to be searched includes the following:

Abt Associates  
 After-School Alliance  
 After-School Corporation  
 Alliance for Excellent Education  
 American Enterprise Institute  
 American Institutes of Research  
 American Speech-Language-Hearing Association (ASHA)  
 American Youth Policy Forum  
 Appalachian Education Laboratory (Edvantia)  
 Best Evidence Encyclopedia  
 Broad Foundation (Education)  
 Brookings Institution  
 Carnegie Corporation of New York  
 Center for Comprehensive School Reform and Improvement  
 Center for Data-Driven Reform in Education  
 Center for Research and Reform in Education  
 Center for Research in Educational Policy (CREP)  
 Center for Social Organization of Schools  
 Center on Education Policy  
 Center on Instruction  
 Chapin Hall Center for Children at the University of Chicago  
 Child Care and Early Education Research Connections  
 Congressional Research Service (via OpenCRS.org)  
 Council for Exceptional Children  
 Council for Learning Disabilities  
 Education Resources Institute  
 Finance Project  
 Florida Center for Reading Research (FCCR)

Government Accountability Office (GAO)  
Harvard Family Research Project  
Harvard Graduate School of Education  
Heritage Foundation  
Hoover Institution  
Institute for Higher Education Policy  
Institute for Public Policy and Social Research (IPPSR)  
Johns Hopkins University School of Education  
Learning Disabilities Association of America  
Learning Point Associates  
Linguistic Society of America (LSA)  
Mathematica Policy Research homepage  
MDRC  
Mid-continent Research for Education and Learning  
National Association for Bilingual Education (NABE)  
National Association of State Boards of Education  
National Association of State Directors of Special education  
National Autism Center - National Standards Project  
National Center for Learning Disabilities  
National Center for Research on Evaluation, Standards, and Student Testing (CRESST) at  
UCLA  
National Center on Response to Intervention (RTI)  
National Center on Secondary Education and Transition  
National Child Care Information and Technical Assistance Center (NCCIC)  
National College Access Network  
National Dissemination Center for Children with Disabilities  
National Dissemination Center for Children with Disabilities (NICHCY)  
National Dropout Prevention Center/Network  
National Governors' Association  
National Institute for Early Education Research (NIEER)  
National Institute on Out-of-School Time at the Wellesley Centers for Women  
National Reading Panel  
Northwest Regional Education Lab  
Pacific Resources for Education and Learning (PREL)  
Pathways to College Network  
Policy Studies Associates  
PolicyArchive  
Promising Practices Network  
Public Education Network  
Public Policy Research Institute at Texas A&M University

Public/Private Ventures (PPV)  
RAND  
Regional Education Lab Appalachia  
Regional Educational Laboratory Northeast and Islands  
Resources on Afterschool  
Southeast Regional Education Lab (included in the SERVE Center)  
Southwest Educational Development Laboratory (SEDL)  
SRI  
Teachers of English to Speakers of Other Languages (TESOL)  
Technical Assistance Center on Social Emotional Intervention for Young Children  
Thomas B. Fordham Institute  
U.S. Department of Education (includes Institute for Education Sciences, National Center for Special Education Research etc)  
Urban Institute  
WestEd (includes REL West)

## Intervention Search

**Objective:** To identify *all* effectiveness studies conducted for a specific intervention identified in the keyword search.

### Search Strategy:

- Conduct standard library searches of the intervention name (e.g., video-modeling).<sup>1</sup>
- Scan references to identify possible synonyms for the intervention in the literature. Conduct standard library searches of these terms.
- Once potentially eligible studies are identified, request full text and review the reference lists to cross-check search results. Similarly, review relevant literature reviews. Revise search terms as needed.
- Identify seminal researchers associated with the intervention. Conduct full-text searches of the researcher name combined with the intervention name.
- Identify seminal studies of the intervention and conduct searches of the associated citation.

All references resulting from these searches will be screened for eligibility.

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<sup>1</sup> A standard library search consists of searching titles and abstracts in each of the databases described above.