



Social skills group interventions for autism spectrum disorders in individuals aged 6 to 21 years (Protocol)

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Protocol information

Co-registration: This protocol is co-registered within both the Cochrane and Campbell Collaborations. A version of this review can also be found in the Cochrane library.

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What's new

Date / Event	Description
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History

Date / Event	Description
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Abstract

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[Summary title]

[Summary text]

Background

Description of the condition

Autism and the related pervasive developmental disorders are early-onset conditions characterized by delay and deviance in the development of social, communicative, and other skills. In contrast to the lack of social interest that characterizes autism, unusual sensitivity to the inanimate environment is also typical and can take the form of motor mannerisms (stereotypies), difficulties with change, and idiosyncratic interests/preoccupations. Currently, recognized disorders in this group include autistic disorder, Rett's syndrome, childhood disintegrative disorder, Asperger's disorder, and pervasive developmental disorder not otherwise specified/atypical autism ([Volkmar 2005a](#)).

Autistic disorder is by far the best known of the pervasive developmental disorders, and is always apparent before age 3 years ([Volkmar 2005a](#)). The condition is frequently associated with an unusual pattern of strengths and difficulties and with intellectual disability. Autism was not recognized as a disorder in diagnostic manuals until 1980 but since that time, research has grown dramatically with over 1000 peer reviewed publications devoted to the topic in 2009. A growing body of work has clarified the strongly genetic nature of the condition ([Gupta 2007](#)) and its association with various neurobiological factors – including increased risk for seizures ([Minschew 2005](#)). Asperger's disorder and pervasive developmental disorder, not otherwise specified (PDD-

NOS) share many features with autism but differ in that in Asperger's disorder early verbal skills are preserved and there may be an even stronger genetic contribution ([Klin 2005](#)). In PDD-NOS, the severity of social and other difficulties is less than that of either Asperger's disorder or autistic disorder, although some features suggestive of these conditions must be present for this diagnosis to be made ([Towbin 2005](#)).

Advances in treatment have occurred over the past decade and prognosis appears to be improving. Whereas the earliest outcome studies suggested, at best, that 5% of individuals became independent as adults, more recent studies estimate these figures to be in the region of 20% to 25% even for 'classical' autism ([Howlin 2005](#)). Several factors appear involved in this change including a greater number of individuals being diagnosed with higher functioning autism spectrum disorders (ASDs; e.g., high functioning autism, Asperger's disorder, PDD-NOS) (although the improvement predates the implementation of the current *DSM-IV-TR* ([APA 2000](#)) or *ICD-10* ([WHO 1994](#)) approach), earlier detection and intervention, and the mandate, in many developed countries, for educational services (see [Volkmar 2005b](#) for a description of international perspectives and mandates on treatments). In the U.S. for example, the passage of the Education of All Handicapped Children Act in 1975 established the right of all children to education. Before these changes, few individuals with autism received school based service ([Volkmar 2009](#)). Significant advances have been made in educational intervention programs as well as in pharmacotherapy ([Volkmar 2009](#)). Given the centrality of social skills, both as a central defining feature of the condition and a critical area for intervention, work on social skills treatments have been an important area of emerging research over the past decade. In parallel with this growing body of work (see [Volkmar in press](#)) there also have been significant advances in research which have clarified the major contribution of autistic social dysfunction to learning and intellectual difficulties. For example, studies using fMRI procedures have replicably shown differences in the ways children with autism process the most salient social feature in the environment – the human face ([Schultz 2000](#)). Another line of work has used innovative eye tracking methods which suggest that perhaps 90% of available social-affective information is lost to individuals with autism ([Klin 2002a](#); [Klin 2002b](#)). Various attempts have been made to provide theoretical overviews of these difficulties and their close connection to learning and behavioral challenges (see [Klin 2003](#) for a review).

Social Skills of Individuals with ASD

Since autism was first described ([Kanner 1943](#)), major difficulties in social interaction have been a defining feature of individuals with ASD ([Carter 2005](#)). These difficulties have been identified as the single most powerful predictor of diagnostic status ([Siegel 1989](#)). Difficulties in the social arena typically remain

an area of great vulnerability even for the most cognitively able individuals with ASDs ([Howlin 2005](#); [Shea 2005](#)). Therefore, social skills training is an important aspect of intervention programming. There are a number of treatment methods including Social Stories, peer-mediated interventions, scripts and script fading, social skills group, video modeling (see [Paul 2003](#); [Reichow 2010](#)). However, total amelioration of social skills deficits do not occur, and social difficulties remain even in individuals with good treatment.

Description of the intervention

Social skills group interventions for individuals with ASD are a commonly used intervention and several protocols, (e.g., [McGinnis 1997](#), [Painter 2006](#)) have now been published. The intervention is characterized by participation of 2 to 6 individuals with ASD in therapy sessions led by a team of 1 to 3 professional therapists (e.g., licensed). Participants of social skills group interventions are mainly school-aged or higher (i.e., older than 6 years old). The group typically meets once per week for 60 to 90 minutes for 12+ weeks (i.e., 3 months), although a relation between treatment intensity and/or duration has not been established. A social skills group session typically includes a structured lesson on a specific skill, modeling of the skill, role playing rehearsal/practice of the modeled skill, discussion, and individualized performance feedback. Common topics for the groups vary with respect to the age and/or functioning level of the group members, but often include emotional recognition and regulation, social competence, social problem solving, and social communication ([Rao 2008](#); [White 2007](#)).

How the intervention might work

The exact mechanism through which social skills group interventions change behavior is not known, but is theoretically based on learning theory. Social skills group interventions for individuals with ASD are thought to affect an individual's social functioning by providing instruction on specific social skills in a group format that allows for immediate rehearsal and practice of the learned skills. The social skill group intervention format also allows for immediate reinforcement for using the targeted skill (in an unstructured setting, the reinforcement for using a social skill might be social reinforcement, which may or may not be a reinforcer for an individual with autism). Providing immediate reinforcement for displaying the desired (targeted) social skill should increase the likelihood of the skill being used again, thereby providing the individual with additional repetitions and practice.

Why it is important to do this review

As noted previously it does appear that outcome for individuals with autism, Asperger's disorder, and PDD-NOS has significantly improved over the last several decades. This appears to result from several factors including earlier

diagnosis, explicit teaching of skills critical to learning, and agreement on many aspects of effective intervention programs ([National Research Council 2001](#)). The growing body of work on very young children at risk for autism (e.g., siblings) has helped to clarify important aspects of early difficulties which likely have a severe impact on subsequent learning, e.g., problems in social attention and joint attention, difficulties with social versus nonsocial environmental salience, and so forth ([Volkmar 2009](#)). The enhancement of learning is likely expressed in multiple contexts, e.g., with peers, in schools, and in generalization of skills across settings and in the community. Although a frequently recommended practice, only a handful of studies have addressed the issues of efficacy of social skills group interventions, which have shown mixed results ([Rao 2008](#); [Reichow 2010](#); [White 2007](#)). The reasons for these mixed results are unknown, but malleable factors such as intervention density, age of participants, degree of psychopathology, pre-treatment functioning, and the ratio of the number of therapists to group members are possible moderators of effect that are plausible. Development of effective social interventions is a high priority for the field. Given the frequent recommendation of social skills group interventions, the growing body of empirical evidence, and the mixed results not uncommon in these studies, a systematic review investigating the most effective methods of conducting social skills group interventions for individuals with ASD seems an important and timely undertaking.

Objectives

1. Systematically to review the evidence for the effectiveness of social skills group interventions for individuals with ASD.
2. To identify the characteristics of the methods and for which sub-sample(s) of children social skills group interventions for individuals with ASD are most successful.

Methods

Criteria for considering studies for this review

Types of studies

Randomized control trials and quasi-randomized control trials comparing treatment (social skills groups) to a group not receiving treatment (e.g., no treatment control, wait list control, treatment as usual). A trial will be considered quasi-randomized when systematic methods of allocation to groups are used (e.g., day of week, case number presentation).

Types of participants

Children and young adults aged 6 to 21 with ASD (i.e., autistic disorder, Asperger's disorder, PDD-NOS, Rett's syndrome, childhood disintegrative disorder), defined by diagnosis according to *DSM-IV-TR* ([APA 2000](#)) or *ICD-10* ([WHO 1994](#)).

Types of interventions

Social skills group interventions, delivered by professional personnel in groups of at least two individuals, in any setting at any frequency or duration (see [Background](#) for description of social skills group interventions). Participants may or may not be receiving standard treatment in addition to the social skills group intervention. Support group and psychodynamic group therapies will not be included in this review.

The comparison groups will typically be standard treatment groups or wait list control groups. Individuals with autism typically receive many treatments ([Green 2006](#); [Goin-Kochel 2007](#)), thus finding a standardized comparison group might be difficult.

Types of outcome measures

Primary outcomes

1. Social Competence

The primary outcome (i.e., social competence) will typically be measured through parent and/or teacher report on a standardized assessment scale (e.g., Vineland Adaptive Behavior Scale ([Sparrow 1984](#)), Social Skills Rating System ([Gresham 1990](#))). It is expected that some studies will have used researcher created or defined measures of social competence as well. Due to the likely variability in quality, we will consider all measures but we will discuss the evidence of their reliability and validity, which will be included as an item in the risk of bias assessment.

Secondary outcomes

1. Social communication

2. Quality of life

3. Individual (e.g., specific) behaviors

The secondary outcomes (i.e., social communication, quality of life, and individual behaviors) will typically be measured using standardized assessments, qualitative data (e.g., social validity), parent and/or teacher rated scales, and behavioral observation. As with the primary measures, it is expected that some studies will have used researcher created or defined measures of social competence as well. Due to the likely variability in quality, we will consider

all measures but we will discuss the evidence of their reliability and validity, which will be included as an item in the risk of bias assessment.

We will group outcome time points as follows: immediately post-intervention, 1 to 5 months post-intervention, 6 to 11 months post-intervention, 12 to 23 months post-intervention, 24 to 35 months post-intervention, etc.

We will determine the clinical relevance of each outcome measure (e.g., how well does the measure approximate real life social skills) through discussion of each measure.

We will report the outcomes social competence, social communication, and quality of life in the Summary of Findings Table.

Search methods for identification of studies

See: Cochrane Developmental, Psychosocial and Learning Problems Group methods used in reviews.

Electronic searches

The following electronic databases will be searched, with no language restrictions:

Cochrane Central Register of Controlled Trials (*The Cochrane Library*) (Latest issue)

MEDLINE (1950-current)

EMBASE (1980 current)

CINAHL PLUS (1937- current)

PsycINFO (1806 current)

Sociological Abstracts (1952-current)

ERIC (1966 current)

Social Science Citation Index (SSCI) (1970 current)

Dissertation Abstracts International (1981 - current)

metaRegister of Controlled Trials (latest issue)

The search strategy will employ sensitivity rather than specificity to avoid missing any potential studies. The following search strategy will be used to search MEDLINE:

- 1 exp Child Development Disorders, Pervasive/
- 2 exp Communication/
- 3 autis\$.tw.
- 4 PDD.tw.

- 5 pervasive developmental disorder\$.tw.
- 6 (language adj3 delay\$.tw.
- 7 communicat\$.tw.
- 8 (speech adj3 disorder\$.tw.
- 9 childhood schizophrenia.tw.
- 10 kanner\$.tw.
- 11 asperg\$.tw.
- 12 or/1-11
- 13 (social skills adj3 (group\$ or train\$ or program\$ or therap\$)).tw.
- 14 12 and 13

Search terms will be modified as necessary when searching other databases. No filters such as language or randomized controlled trials will be used to prevent missing any relevant study.

Searching other resources

Gray Literature

At least three databases that will be searched contain unpublished theses and dissertations. We hope to identify additional unpublished and ongoing trials by searching the following sources:

Reference lists

We will search the reference lists of the studies included in this review and relevant papers to identify additional studies in the published or unpublished literature.

Correspondence

We will contact the authors of the included studies to identify any unpublished or ongoing trials.

Data collection and analysis

Selection of studies

Two review authors (BR and FV) will independently screen the titles and abstracts yielded by the search against the inclusion criteria listed above. We will obtain and independently screen the full text of papers or reports for trials that appear relevant or for which more information is needed to determine relevance to determine whether they meet the criteria for inclusion. We will resolve disagreement about eligibility through discussion and, when disagreements cannot be resolved, we will seek advice from a mediator. We will

contact study authors for additional information as necessary to resolve questions about the relevance or methodology of a trial. We will record the reasons for excluding trials. Neither of the review authors will be blind to the study authors, institutions, or the journals of publication of the articles.

Data extraction and management

We will independently extract data for each trial using a data extraction form to collect information about the population, the intervention, randomization methods, blinding, sample size, outcome measures, follow-up duration, attrition and handling of missing data, and methods of analysis. We will use this information to assess methodological quality and we will include it in the descriptions of included and excluded studies where relevant in the review. When data are missing, one author (BR) will contact the authors to request additional information. If further information cannot be obtained, the variables in question will be coded as "unsure."

Assessment of risk of bias in included studies

We will independently assess methodological quality using The Cochrane Collaboration's tool for assessing risk of bias ([Higgins 2008](#)). We will resolve any disagreements by discussion and, if necessary, disagreements will be arbitrated by a third party. We will use the tool to assess the following domains: sequence generation, allocation concealment, blinding, type of outcome measures, incomplete outcome data, selective outcome reporting, types of outcome measures, assessing incomplete outcome measures, selective reporting, treatment fidelity, and other sources of bias.

We will present the quality of the trials in a risk of bias table where, for each question-based entry, the judgment ('yes' for low risk of bias; 'no' for high risk of bias, or 'unclear') of the review authors will be followed by a text box providing details on the available information that lead to each judgment. The sources of bias that we will assess are:

Sequence generation

Randomization will receive the following judgments:

'yes' when participants were allocated to treatment conditions using randomization such as computer-generated random numbers, a random numbers table, or coin-tossing;

'unclear' when randomization method was not clearly stated or unknown;

'no' when randomization did not use any of the above methods or randomization was not used (i.e., for quasi-randomized trials).

Selection bias

Selection bias will receive the following judgments:

'yes' when groups of participants did not have mean differences in baseline characteristics;

'unclear' when baseline characteristics of different groups of participants was not clearly stated or is unknown;

'no' when different groups of participants had mean differences in baseline characteristics.

Allocation concealment

Allocation concealment will receive the following judgments:

'yes' when participants and researchers were unaware of participants' future allocation to treatment condition until after decisions about eligibility were made and informed consent was obtained;

'unclear' when allocation concealment was not clearly stated or unknown;

'no' when allocation was not concealed from either participants before informed consent or from researchers before decisions about inclusion were made or allocation concealment was not used.

Blinding

Quality of blinding will be determined whether participants, treatment personnel, and individuals involved in the outcome measure assessments were blind to treatment conditions, and the quality of blinding will receive the following judgments:

'yes' when all three groups were blind to the treatment conditions;

'unclear' when blinding information was not available from researchers;

'no' when one or more groups were not blind to treatment conditions.

Type of outcome measures

Addressing incomplete outcomes

The adequacy of the way the authors of the trials dealt with missing data will receive the following judgments:

'yes' when the number of participants randomized to groups is clear and it is clear that all participants completed the trials in all participant groups;

'unclear' when information about which participants completed the study could not be acquired by contacting the researchers of the study;

'no' when there is clear evidence that there was attrition or exclusion from analysis in at least one participant group.

Selective reporting

The likelihood that the authors of the trial omitted some of the collected data when presenting the results will be determined and will receive the following judgments:

'yes' when all collected data seem to be reported.

'unclear' when it is not clear whether other data were collected and not reported.

'no' when the data from some measures used in the trial are not reported.

Treatment fidelity

The assessment will also take into account whether the researchers took any steps to ensure that practitioners maintained fidelity to the treatment protocol by using, for example, treatment manuals, training sessions, and supervision, and will receive the following judgments:

'yes' for studies showing evidence that efforts to ensure treatment fidelity were made;

'no' for studies in which treatment fidelity was not apparent or in which there is evidence that treatment fidelity was low.

Other bias

Other potential sources of bias

Assessment will determine whether any other bias is present in the trial, such as stopping the trial early, changing methods during the trial, or other anomalies.

Measures of treatment effect

Dichotomous data

Where dichotomous data are presented, we will calculate a risk ratio with a 95% confidence interval and the number needed to treat with a 95% confidence interval for each outcome in each trial ([Higgins 2008](#)).

Continuous data

We will analyze continuous data when means and standard deviations are presented in the study papers, are made available by the authors of the trials, or are calculable from the available data. Where outcomes are measured using the same scale, we will calculate a mean difference to determine the differences in mean scores between groups. Where similar outcomes are measured using different scales, we will calculate a standardized mean difference using Hedges *g* with small sample correction ([Hedges 1985](#)). The meta-analysis will combine all three types of effect sizes by transforming to a single effect size metric. We will convert raw mean differences to standard mean differences.

Unit of analysis issues

The inclusion of cross-over trials cannot be ruled out. Where appropriate, we will combine the results of the cross-over trials with the results of the parallel-group trials. If data from a cross-over trial are restricted or cannot be obtained from the

authors, we will use the presented data within the first phase up to the point of cross-over. We will pool data from cross-over trials according to the methods described by Higgins and Green ([Higgins 2008](#)) and Elbourne and colleagues ([Elbourne 2002](#)). Issues of studies using more than two experimental groups, such as if a study includes a wait-list control, and an alternative treatment to social skills groups might also be encountered. When this occurs, precedence will be given to making comparisons of trials that were run concurrently (e.g., comparison of treatment and wait list control). If a study were to compare social skills group interventions with another type of social skills intervention and a third group not receiving treatment, the comparison would be made between the social skills group intervention group and the no treatment control.

Dealing with missing data

We will assess missing data and dropouts in the included studies. We will investigate and report reasons, numbers, and characteristics of dropouts. We will endeavor to contact the authors of trials when further information or data are necessary. Any meta-analyses will use data from all original participants when possible, and will report when that is not the case. For studies in which the missing data are not available, we will use a sensitivity analysis to assess potential bias in the analysis and we will discuss the extent to which the results might be biased by missing data. Due to the heterogeneity shown by individuals with ASD, we will not impute missing data.

Assessment of heterogeneity

We will examine heterogeneity among included studies through the use of the Chi² test, where a low P value indicates heterogeneity of treatment effects. We will also use the I² statistic ([Higgins 2002](#)) to determine the percentage of variability that is due to heterogeneity rather than sampling error or chance. We will also discuss the possible reasons for any heterogeneity and conduct sensitivity analyses accordingly, where data permit. Subgroup analyses may be used to investigate this further, as described below.

Assessment of reporting biases

We will use funnel plots to investigate the relations between effect size and standard error when possible. When such a relation is found, we will conduct sensitivity analyses to determine what, if any, impact the biases had on the results.

Data synthesis

We will conduct meta-analyses when event rates or means and standard deviations are available or can be calculated and studies include similar interventions and outcome measurements. The meta-analysis will combine all three types of effect sizes by transforming to a single effect size metric. Raw

mean differences will be converted to standard mean differences. Although studies will only be combined if similar, where the Chi² test or the I² statistic indicate that heterogeneity is likely, we will use a random-effects meta-analysis. Where studies appear to be homogeneous according to known characteristics and those statistics, we will use a fixed-effect model. When meta-analysis is inappropriate, we will provide only a narrative description of the study results, although general conclusions about the effectiveness of social skills group interventions would not be possible in that case.

Subgroup analysis and investigation of heterogeneity

Further investigation of the causes of heterogeneity may be conducted using subgroup analyses. Possible subgroups that may be examined if present are: type of trial (e.g., randomized or quasi-randomized), intervention density and duration, age of participants, diagnostic category, and level of pre-treatment cognitive, communicative, and social functioning.

Sensitivity analysis

In order to explore the impact of varying aspects of methodological quality that might impact on the robustness of the results of the review, we will conduct sensitivity analyses by removing studies with particular characteristics and re-analyzing the remaining studies to determine whether the relevant factors affect the results. These analyses will be conducted to examine the effects of:

1. The removal of studies with variability across studies in the definition, measurement, or reporting of results (e.g., if the number of participants varies in the report or if measures were not taken at consistent time points for all participants)
2. The removal of studies with variability across studies in treatments comparison groups were receiving
3. The removal of studies that did not make efforts to ensure treatment fidelity (e.g., use of treatment manual, training, supervision)
4. Reanalyzing the data using different statistical approaches (e.g., using a fixed-effect model instead of a random-effects model) ([Higgins 2008](#))

Results

Description of studies

Results of the search

Included studies

Excluded studies

Risk of bias in included studies

Allocation

Blinding

Incomplete outcome data

Selective reporting

Other potential sources of bias

Effects of interventions

Discussion

Summary of main results

Overall completeness and applicability of evidence

Quality of the evidence

Potential biases in the review process

Agreements and disagreements with other studies or reviews

Authors' conclusions

Implications for practice

Implications for research

Acknowledgements

Contributions of authors

BR and FV contributed to the development of this protocol. BR and FV drafted the introduction. BR drafted the objectives and methods, which were reviewed by FV. BR and FV will screen the abstracts and titles, retrieve potentially eligible papers, and make decisions about eligibility - any disagreements will be resolved by conference until there is agreement. BR will extract data, which will

be doubled-checked by FV. BR will draft the full review with regular input from FV at every stage.

Declarations of interest

None known.

Differences between protocol and review

Published notes

Characteristics of studies

Characteristics of included studies

Footnotes

Characteristics of excluded studies

Footnotes

Characteristics of studies awaiting classification

Footnotes

Characteristics of ongoing studies

Footnotes

Summary of findings tables

Additional tables

References to studies

Included studies

Excluded studies

Studies awaiting classification

Ongoing studies

Other references

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Other published versions of this review

Classification pending references

Data and analyses

Figures

Sources of support

Internal sources

- Associates of the Yale Child Study Center, USA
- Yale University School of Medicine, USA

External sources

- No sources of support provided

Feedback

Appendices