Effective Health Care Program

Comparative Effectiveness Review
Number 137

Therapies for Children With Autism Spectrum Disorder: Behavioral Interventions Update

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Number 137

Therapies for Children With Autism Spectrum Disorder: Behavioral Interventions Update

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Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-based Practice Centers (EPCs), sponsors the development of systematic reviews to assist public- and private-sector organizations in their efforts to improve the quality of health care in the United States. These reviews provide comprehensive, science-based information on common, costly medical conditions, and new health care technologies and strategies.

Systematic reviews are the building blocks underlying evidence-based practice; they focus attention on the strength and limits of evidence from research studies about the effectiveness and safety of a clinical intervention. In the context of developing recommendations for practice, systematic reviews can help clarify whether assertions about the value of the intervention are based on strong evidence from clinical studies. For more information about AHRQ EPC systematic reviews, see www.effectivehealthcare.ahrq.gov/reference/purpose.cfm.

AHRQ expects that these systematic reviews will be helpful to health plans, providers, purchasers, government programs, and the health care system as a whole. Transparency and stakeholder input are essential to the Effective Health Care Program. Please visit the Web site (www.effectivehealthcare.ahrq.gov) to see draft research questions and reports or to join an email list to learn about new program products and opportunities for input.

We welcome comments on this systematic review. They may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850, or by email to epc@ahrq.hhs.gov.

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Technical Expert Panel

In designing the study questions and methodology at the outset of this report, the EPC consulted several technical and content experts. Broad expertise and perspectives were sought. Divergent and conflicted opinions are common and perceived as healthy scientific discourse that results in a thoughtful, relevant systematic review. Therefore, in the end, study questions, design, methodologic approaches, and/or conclusions do not necessarily represent the views of individual technical and content experts.

Technical Experts must disclose any financial conflicts of interest greater than $10,000 and any other relevant business or professional conflicts of interest. Because of their unique clinical or content expertise, individuals with potential conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any potential conflicts of interest identified.

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Peer Reviewers must disclose any financial conflicts of interest greater than $10,000 and any other relevant business or professional conflicts of interest. Because of their unique clinical or content expertise, individuals with potential nonfinancial conflicts may be retained. The TOO

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Therapies for Children With Autism Spectrum Disorder: Behavioral Interventions Update

Structured Abstract

Objective. We updated a prior systematic review of interventions for children (0–12 years) with autism spectrum disorder (ASD), focusing on recent studies of behavioral interventions.

Data sources. We searched the MEDLINE® (PubMed®), PsycInfo, and Educational Resources Information Clearinghouse (ERIC) databases as well as the reference lists of included studies and recent systematic reviews. We conducted the search in December 2013.

Methods. We included comparative studies (with treatment and comparison groups) of behavioral interventions with at least 10 participants with ASD in the update, and made our conclusions based on the cumulative comparative evidence across the original report and update. Two investigators independently screened studies against predetermined inclusion criteria and independently rated the quality of included studies.

Results. We included 65 unique studies comprising 48 randomized trials and 17 nonrandomized comparative studies (19 good, 39 fair, and 7 poor quality) published since the prior review. The quality of studies improved compared with that reported in the earlier review; however, our assessment of the strength of evidence (SOE), our confidence in the stability of effects of interventions in the face of future research, remains low for many intervention/outcome pairs. Early intervention based on high-intensity applied behavior analysis over extended timeframes was associated with improvement in cognitive functioning and language skills (moderate SOE for improvements in both outcomes) relative to community controls in some groups of young children. The magnitude of these effects varied across studies, potentially reflecting poorly understood modifying characteristics related to subgroups of children. Early intensive parent training programs modified parenting behaviors during interactions; however, data were more limited about their ability to improve developmental skills beyond language gains for some children (low SOE for positive effects on language). Social skills interventions varied in scope and intensity and showed some positive effects on social behaviors for older children in small studies (low SOE for positive effects on social skills). Studies of play/interaction-based approaches reported that joint attention interventions may demonstrate positive outcomes in preschool-age children with ASD when targeting joint attention skills (moderate SOE); data on the effects of such interventions in other areas were limited (low SOE for positive effects on play skills, language, social skills). Studies examining the effects of cognitive behavioral therapy on anxiety reported positive results in older children with IQs ≥70 (high SOE for improvements in anxiety in this population). Smaller short-term studies of other interventions reported some improvements in areas such as sleep and communication, but data were too sparse to assess their overall effectiveness.

Conclusions. A growing evidence base suggests that behavioral interventions can be associated with positive outcomes for children with ASD. Despite improvements in the quality of the included literature, a need remains for studies of interventions across settings and continued improvements in methodologic rigor. Substantial scientific advances are needed to enhance our

understanding of which interventions are most effective for specific children with ASD and to isolate elements or components of interventions most associated with effects.

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Executive Summary

Background

Autism spectrum disorder (ASD) is a neurodevelopmental disorder marked by impaired social communication and social interaction accompanied by atypical patterns of behavior and interest. ASD is differentiated from other developmental disorders by significant impairments in social interaction and communication, along with restrictive, repetitive, and stereotypical behaviors and activities.[1] Social communication and social interaction features include deficits in social-emotional reciprocity (e.g., deficits in joint attention, atypical social approach and response, conversational challenges, reduced sharing of interest, emotions, and affect); deficits in nonverbal communication (e.g., atypical eye contact, reduced gesture use, limited use of facial expressions in social interactions, challenges understanding nonverbal communication); and deficits in forming and maintaining relationships (e.g., diminished peer interest, challenges joining in play, difficulties adjusting behavior to social context).

ASD features of restricted repetitive patterns of behavior, interests, or activities may include stereotyped motor mannerisms, use of objects, or speech (e.g., simple motor stereotypies, repetitive play, echolalia, and formal or idiosyncratic speech); insistence on sameness, inflexible adherence to routines, or ritualized patterns of behavior (e.g., distress at small changes, rigid patterns of thought and behavior, performance of everyday activities in ritualistic manner); intense preoccupation with specific interests (e.g., strong attachment to objects, circumscribed or perseverative topics of interest); and sensory sensitivities or interests (e.g., hyperreactivity or hyporeactivity to pain and sensory input, sensitivity to noise, visual fascination with objects or movement).[2-4]

ASD symptoms cause impairment across many areas of functioning and are present early in life. However, impairments may not be fully evident until environmental demands exceed children's capacity. They also may be masked by learned compensatory strategies later in life. Many children with ASD may also have intellectual impairment or language impairment, and the disorder may be associated with known medical, genetic, or environmental factors.

Treatments for ASD that families pursue include behavioral, educational, medical, allied health, and complementary approaches. Individual goals for treatment vary for different children and may include combinations of therapies. For many individuals, core symptoms of ASD (impairments in communication and social interaction and restricted/repetitive behaviors and interests) may improve with intervention and over time;[5-8] however, deficits typically remain throughout the lifespan. Lifelong management—often using multiple treatment approaches—may be required to maximize functional independence and quality of life.

Scope and Key Questions

Scope of Review

This systematic review updates the behavioral intervention portion of our comprehensive review of therapies for children with ASD published in 2011.[9] ASD intervention categories overlap substantially, and it can be difficult to cleanly identify the category into which an intervention should be placed. Ultimately, we defined behavioral interventions to include early intensive behavioral and developmental interventions, social skills interventions, play/interaction-focused approaches, interventions targeting symptoms commonly associated

with ASD, and other general psychosocial approaches. This behavioral category of intervention explicitly does not include primarily medical interventions, complementary and alternative interventions, allied health interventions, or educationally focused interventions unless a behavioral intervention representative of the operationalization above was included within the study design.

At the time of the 2011 review (available at www.effectivehealthcare.ahrq.gov/ehc/products/106/656/CER26_Autism_Report_04-14-2011.pdf), the strength of the evidence was considered low for the effectiveness of early intensive behavioral and developmental interventions. Positive outcomes from an early and intensive behavioral and developmental intervention were noted in cognitive performance, language skills, and adaptive behavior when the intervention was delivered over substantial intervals of time (i.e., 1–2 years). Variability in response to such approaches was tremendous, with subgroups of children who demonstrated a more modest response. The ability to describe and predict these subgroups was limited.

Some other behavioral interventions that varied widely in terms of scope, target, and intensity had demonstrated effects, but the lack of consistent data limited understanding of whether these interventions were linked to specific clinically meaningful changes in functioning. Information was similarly lacking on modifiers of effectiveness, generalization of effects outside the treatment context, components of multicomponent therapies that drive effectiveness, and predictors of treatment success.

Since the publication of the initial review in 2011, a sizable body of research has been published, particularly addressing behavioral interventions. Additional studies of behavioral interventions have the greatest potential to alter the low and insufficient strength of evidence reported in the original review and may potentially be used to update treatment recommendations due to the number of new studies available. For this reason, the current review update focuses on studies of behavioral interventions.

Key Questions

We focused this review on behavioral treatments for children ages 2–12 with ASD and children younger than age 2 at risk of a diagnosis of ASD. We synthesized evidence in the published literature to address the following Key Questions (KQs).

KQ 1: Among children ages 2–12 with ASD, what are the short- and long-term effects of available behavioral treatment approaches? Specifically—

KQ 1a: What are the effects on core symptoms (e.g., social communication and interaction, restricted and repetitive behaviors) in the short term (≤6 months)?

KQ 1b: What are the effects on commonly associated symptoms (e.g., motor, medical, mood/anxiety, irritability, and hyperactivity) in the short term (≤6 months)?

KQ 1c: What are the longer term effects (>6 months) on core symptoms (e.g., social communication and interaction, restricted and repetitive behaviors)?

KQ 1d: What are the longer term effects (>6 months) on commonly associated symptoms (e.g., motor, medical, mood/anxiety, irritability, and hyperactivity)?

KQ 2: Among children ages 2–12, what are the modifiers of outcome for different behavioral treatments or approaches?

KQ 2a: Is the effectiveness of the therapies reviewed affected by the frequency, duration, and intensity of the intervention?
KQ 2b: Is the effectiveness of the therapies reviewed affected by the training and/or experience of the individual providing the therapy?
KQ 2c: What characteristics, if any, of the child modify the effectiveness of the therapies reviewed?
KQ 2d: What characteristics, if any, of the family modify the effectiveness of the therapies reviewed?

KQ 3: Are there any identifiable changes early in the treatment phase that predict treatment outcomes?

KQ 4: What is the evidence that effects measured at the end of the treatment phase predict long-term functional outcomes?

KQ 5: What is the evidence that specific intervention effects measured in the treatment context generalize to other contexts (e.g., people, places, materials)?

KQ 6: What evidence supports specific components of behavioral treatment as driving outcomes, either within a single treatment or across treatments?

KQ 7: What evidence supports the use of a specific behavioral treatment approach in children under the age of 2 who are at high risk of developing ASD based on behavioral, medical, or genetic risk factors?

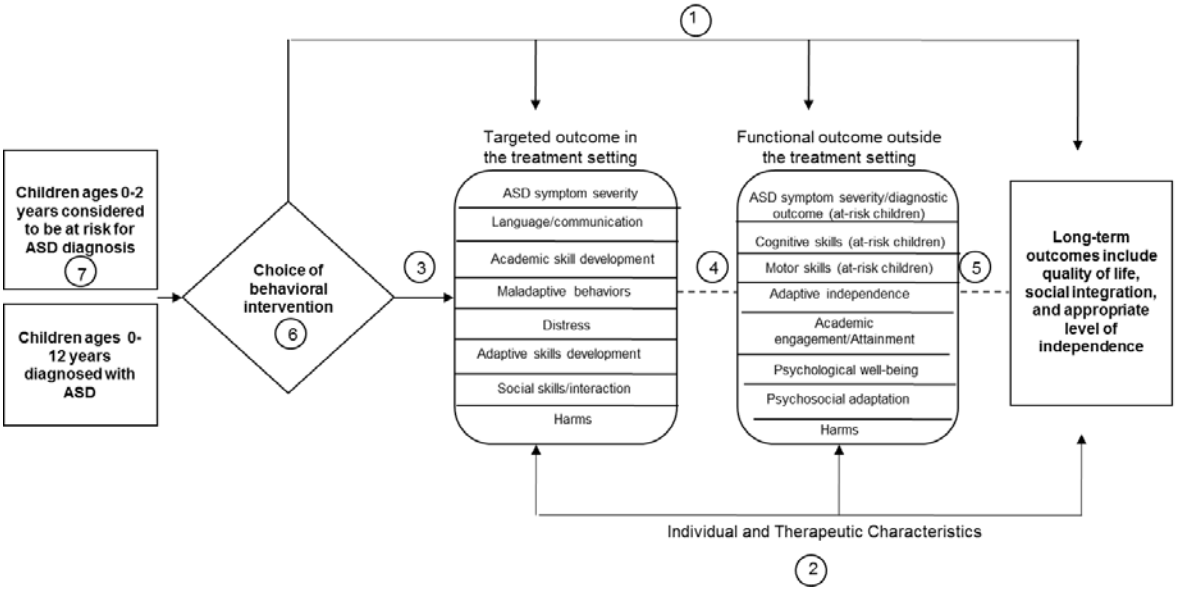
Uses of This Report

We anticipate that the report will be of value to clinicians who treat children with ASD, who can use the report to assess the evidence for different treatment strategies. In addition, this review will be of use to the National Institutes of Health, Centers for Disease Control and Prevention, Centers for Medicare & Medicaid Services, and Health Resources and Services Administration–all of which have offices or bureaus devoted to child health issues and may use the report to compare treatments and determine priorities for funding. This report can bring practitioners up to date about the current state of evidence related to behavioral interventions, and it provides an assessment of the quality of studies that aim to determine the outcomes of therapeutic options for the management of ASD. It will be of interest to families affected by ASD because of the recurring need for families and their health care providers to make the best possible decisions among numerous options. We also anticipate it will be of use to private-sector organizations concerned with ASD; the report can inform such organizations' understanding of the effectiveness of treatments and the amount and quality of evidence available. Researchers can obtain a concise analysis of the current state of knowledge related to behavioral interventions for ASD. They will be poised to pursue further investigations that are needed to understand best approaches to behavioral therapies for children with ASD.

Analytic Framework

Figure A illustrates the analytic framework for the current update. The figure illustrates the placement of the review's KQs within the context of treatment choice, potential outcomes, and characteristics that may affect outcomes. A child entering treatment may be between the ages of 0 and 2 and at risk for diagnosis of ASD or ages 0 to 12 with a diagnosis of ASD. Diagnoses may occur before age 2; thus the represented age ranges overlap.

Figure A. Analytic framework for behavioral interventions for children with ASD



ASD = autism spectrum disorder

Note: Numbers in circles represent placement of Key Questions.

Methods

Literature Search Strategy

A librarian employed search strategies provided in Appendix A of the full report to retrieve research on interventions for children with ASD. We searched MEDLINE® via the PubMed® interface, PsycINFO® (psychology and psychiatry literature), and the Educational Resources Information Clearinghouse using a combination of subject heading terms appropriate for each database and key words relevant to ASD (e.g., autism, Asperger). We limited searches to the English language and literature published since the development of the 2011 review. Our last search was conducted in December 2013. We also manually searched the reference lists of included studies and of recent narrative and systematic reviews and meta-analyses addressing ASD.

Inclusion and Exclusion Criteria

We developed criteria for inclusion and exclusion based on the patient populations, interventions, outcome measures, and types of evidence specified in the KQs and in consultation with a Technical Expert Panel. Table A summarizes criteria.

Table A. Inclusion criteria

Category	Criteria
Study population	Children ages 0–12 with ASD or 0–2 considered to be at risk for ASD based on sibling status or early developmental/behavioral vulnerabilities highly suspicious of ASD
Publication language	English only
Admissible evidence (study design and other criteria)	Admissible designs Randomized controlled trials, prospective and retrospective cohort studies, and nonrandomized controlled trials Other criteria Studies must be original research studies providing sufficient detail regarding methods and results to enable use and aggregation of the data and results. Studies must have relevant population and ≥10 participants with ASD. Studies must address 1 or more of the following for ASD: -Behavioral treatment modality -Predictors of treatment outcomes -Generalization of treatment outcomes to other contexts -Drivers of treatment outcomes Relevant outcomes must be able to be abstracted from data in the papers. Data must be presented in the aggregate (vs. individual participant data).

ASD = autism spectrum disorder

Study Selection

Two reviewers independently assessed each abstract identified for potential inclusion using an abstract review form with questions stemming from our selection criteria. If one reviewer concluded that the article could be eligible for the review based on the abstract, we retained it for full-text assessment. Two reviewers independently assessed the full text of each included study using a similar standardized form. Disagreements between reviewers were resolved by a third-party adjudicator. The group of abstract and full-text reviewers included expert clinicians and researchers and health services researchers; abstract and full-text review forms are in Appendix B of the full report.

Data Extraction

We extracted data from included studies into evidence tables that report study design, descriptions of the study populations (for applicability), description of the intervention, and baseline and outcome data on constructs of interest. Data were initially extracted by one team member and reviewed for accuracy by a second. The final evidence tables are presented in their entirety in Appendix C of the full report. For studies that were reported in the 2011 review and have followup data reported here, the evidence table for the original studies can be found in the 2011 report.[9]

Quality Assessment

We used the approach to assessing the quality of individual studies developed for the 2011 review and following methods outlined in the Agency for Healthcare Research and Quality Effective Health Care Program's "Methods Guide for Effectiveness and Comparative Effectiveness Reviews."[10] We assessed the quality of studies in domains including study design, participant ascertainment, diagnostic approach, and outcome measurement using specific questions to evaluate a study's conduct. We rated each domain individually and combined them

for an overall quality level, as described in the full report. Three levels were possible: good, fair, and poor.

Data Synthesis

We summarized all data qualitatively using evidence tables. We focused on outcomes related to core ASD symptoms (impairments in communication and social interaction and restricted/repetitive behaviors and interests); outcomes including IQ and adaptive behavior; and key symptoms in studies of interventions targeting conditions commonly associated with ASD (e.g., anxiety). For the update, we describe new comparative studies published since the original report, and we make our conclusions and assess the strength of evidence on the cumulative comparative evidence across the original report and update.

Strength of the Body of Evidence

Two senior investigators graded the entire body of evidence (i.e., studies from the 2011 review and studies identified for the current review) based on the "Methods Guide for Effectiveness and Comparative Effectiveness Reviews."[10] The team reviewed the final strength-of-evidence designation.

The assessment of the literature was done by considering how confident we were that the true effect was observed and how stable that effect is likely to be in the face of future research. Strength of evidence describes the adequacy of the current research in terms of both quantity and quality, as well as the degree to which the entire body of current research provides a consistent and precise estimate of effect. Strength of the evidence is assessed for a limited set of critical outcomes, typically those related to effectiveness of an intervention. We assessed the strength of the evidence for studies addressing KQs 1 and 7, which deal specifically with the outcomes of intervention.

We established the maximum strength of evidence possible based on criteria for each domain: study limitations, consistency in direction of the effect, directness in measuring intended outcomes, precision of effect, and reporting bias. (See the full report for further description of domains.) Then we assessed the number of studies and range of study designs for a given intervention-outcome pair and downgraded the rating when the cumulative evidence was not sufficient to justify the higher rating. The possible grades were—

- High: High confidence that the evidence reflects the true effect. Further research is unlikely to change estimates.
- Moderate: Moderate confidence that the evidence reflects the true effect. Further research may change our confidence in the estimate of effect and may change the estimate.
- Low: Low confidence that the evidence reflects the true effect. Further research is likely to change confidence in the estimate of effect and is also likely to change the estimate.
- Insufficient: Evidence is either unavailable or does not permit a conclusion.

Applicability

We assessed applicability by identifying potential population, intervention, comparator, outcome, and setting (PICOS) factors likely to affect the generalizability of results (i.e., applicability to the general population of children with ASD). For this particular review, the most likely factors that could affect applicability are the patient population (e.g., whether or not results are available to assess the utility of given interventions in target populations) and the intervention

(e.g., the difficulty of applying the intervention in a nonresearch setting given available resources). We noted where data were available for specific populations and made relative assessments of applicability for intervention components in the context of resource considerations such as availability of services/programs.

Results

Article Selection

We identified 2,639 newly published citations and abstracts. (Figure 2 in the full report shows the disposition of studies.) We excluded 2,012 studies at abstract review and assessed the full text of 627 studies. Of these, 79 publications, comprising 65 unique studies, met our criteria. Eight of these studies report followup data to papers included in the 2011 review of therapies for children with ASD. The 65 new studies described in this update to add to the conclusions of the original report comprise 48 randomized controlled trials (RCTs) and 17 nonrandomized trials or cohort studies. The full report includes detailed references. Appendix E of the full report includes a list of all studies excluded at the abstract and full-text review stages.

KQ 1. Effects of Behavioral Interventions on Core and Commonly Associated Symptoms in Children With ASD

Studies of Early Intensive Behavioral and Developmental Interventions

We located 37 papers comprising 25 unique studies addressing early intensive behavioral and developmental interventions. The studies included five RCTs of good quality, six of fair quality, and one of poor quality. Individual studies using intensive University of California, Los Angeles (UCLA)/Lovaas-based interventions, the Early Start Denver Model (ESDM), the Learning Experiences and Alternate Program for Preschoolers and their Parents (LEAP) program, and eclectic variants reported improvements in outcomes for young children. Improvements were most often seen in cognitive abilities and language acquisition, with less robust and consistent improvements seen in adaptive skills, core ASD symptom severity, and social functioning.

Young children receiving high-intensity applied behavior analysis (ABA)-based interventions over extended timeframes (i.e., 8 months–2 years) displayed improvement in cognitive functioning and language skills relative to community controls (Table B). However, the magnitude of these effects varied across studies. This variation may reflect subgroups showing differential responses to particular interventions. Intervention response is likely moderated by both treatment and child factors, but exactly how these moderators function is not clear. Despite multiple studies of early intensive treatments, intervention approaches still vary substantially, which makes it difficult to tease apart what these unique treatment and child factors may be. Further, the long-term impact of these early skill improvements is not yet clear, and many studies did not follow children beyond late preschool or early school years.

Studies of high-intensity early intervention services also demonstrated improvements in children's early adaptive behavior skills, but these improvements were more variable than those found for early cognitive and language skills. Treatment effects were not consistently maintained over followup assessments across studies. Many studies measured different adaptive behavior domains (creating within-scale variability), and some evidence suggests that adaptive behavior

changes may be contingent on baseline child characteristics, such as cognitive/language skills and ASD severity.

Evidence for the impact of early intensive intervention on core ASD symptoms is limited and mixed. Children's symptom severity often decreased during treatment, but these improvements often did not differ from those of children in control groups. Better quality studies reported positive effects of intervention on symptom severity, but multiple lower quality studies did not.

Since our previous review, there have been substantially more studies of well-controlled low-intensity interventions that provide parent training in bolstering social communication skills. Although parent training programs modified parenting behaviors during interactions, data were more limited about their ability to improve broad developmental skills (such as cognition, adaptive behavior, and ASD symptom severity) beyond language gains for some children. Children receiving low-intensity interventions have not demonstrated the same substantial gains in cognitive skills seen in the early intensive intervention paradigms.

Social Skills Studies

We located 13 studies addressing interventions targeting social skills, including 11 RCTs. The overall quality of studies improved in comparison with the previous review, with 2 good-quality and 10 fair-quality studies. Social skills interventions varied widely in terms of scope and intensity. A few studies replicated interventions using the Skillstreaming model, which uses a published treatment manual (i.e., is manualized) to promote a consistent approach. Other studies incorporated peer-mediated and/or group-based approaches, and still others described interventions that focused on emotion identification and Theory of Mind training. The studies also varied in intensity, with most interventions consisting of 1–2 hour sessions/week lasting approximately 4–5 weeks. However, some of the group-based approaches lasted 15–16 weeks.

Most studies reported short-term gains in either parent-rated social skills or directly tested emotion recognition. However, our confidence (strength of evidence) in that effect is low (Table B). Although we now have higher quality studies of social skills interventions that demonstrate positive effects, our ability to determine effectiveness continues to be limited by the diversity of the intervention protocols and measurement tools (i.e., no consistent outcome measures used across studies). Studies also included only participants considered "high functioning" and/or with IQ test scores >70, thus limiting generalization of results to children with more significant impairments. Maintenance and generalization of these skills beyond the intervention setting are also inconsistent, with parent and clinician raters noting variability in performance across environments.

Play-/Interaction-Focused Studies

Since our previous review, more studies of well-controlled joint attention interventions across a range of intervention settings (e.g., clinician, parent, teacher delivered) have been published. This growing evidence base includes 11 RCTs of good and fair quality and suggests that joint attention interventions may be associated with positive outcomes for toddler and preschool children with ASD, particularly when targeting joint attention skills themselves as well as related social communication and language skills (Table B). Although joint attention intervention studies demonstrated changes within this theoretically important domain, data are more limited about their ability to improve broad developmental skills (such as cognition, adaptive behavior, and ASD symptom severity) beyond direct measures of joint attention and related communication and language gains over time.

Specific training that used naturalistic approaches to promote imitation (e.g., Reciprocal Imitation Training) was associated with some improvements, not only in imitation skills, but also potentially in other social communication skills (such as joint attention). Additionally, parent training in a variety of play-based interventions was associated with enhanced early social communication skills (e.g., joint attention, engagement, play interactions), play skills, and early language skills.

Studies of Interventions Targeting Conditions Commonly Associated With ASD

Six RCTs (five good and one fair quality) of interventions addressing conditions commonly associated with ASD identified for the current update measured anxiety symptoms as a primary outcome. Five of these studies reported significantly greater improvements in anxiety symptoms in the intervention group compared with controls. Two found positive effects of cognitive behavioral therapy (CBT) on the core ASD symptom of socialization, and one reported improvements in executive function in the treatment group. The one RCT that did not find a significant benefit of CBT compared it with social recreational therapy rather than with treatment as usual or a wait-listed control group.

The studies examining the effects of CBT on anxiety had largely consistent methodologies. Six studies provided followup data reflecting treatment effects that lasted beyond the period of direct intervention. Two common factors limit the applicability of the results, however. Due to the nature of CBT, which is often language intensive and requires a certain level of reasoning skills to make abstract connections between concepts, most studies included only children with IQs much greater than 70. These studies report positive results regarding the use of CBT to treat anxiety in children with ASD (Table B). They also report some positive results in socialization, executive function, and communication; however, these results were less robust, and it is unclear in some studies if these improvements exceeded improvements related to the impact of ameliorated anxiety itself.

Additional data in the current review relate to parent training to address challenging behavior. Specifically, one fair-quality study combined a parent-training approach with risperidone. This combination significantly reduced irritability, stereotypical behaviors, and hyperactivity, and improved socialization and communication skills. However, these effects were not maintained at 1 year after treatment.

Other Behavioral Studies

Two RCTs (one fair and one poor quality) examined neurofeedback and found some improvements on parent-rated measures of communication and tests of executive function. Three fair-quality RCTs reported on sleep-focused interventions, with little positive effect of a sleep education pamphlet for parents in one, improvements in sleep quality in treatment arms (melatonin alone, melatonin + CBT) in another, and some improvements in time to fall asleep in one short-term RCT of sleep education programs for parents. One poor-quality study of parent education to mitigate feeding problems reported no significant effects.

KQ 2. Modifiers of Treatment Effects

Among the potential modifiers or moderators of early intensive ABA-based interventions, younger age at intake was associated with better outcomes for children in a limited number of studies. Greater baseline cognitive skills and higher adaptive behavior scores were associated

with better outcomes across behavioral interventions, but again, these associations were not consistent. In general, children with lower symptom severity or less severe diagnoses improved more than participants with greater impairments. Many studies (e.g., social skills, CBT) restricted the range of participants' impairment at baseline (e.g., recruiting only participants with IQs >70), limiting understanding of intervention impact on broader populations. Studies assessing parental responsiveness to children's communication typically reported better outcomes in children whose parents were more aligned with the child's communication versus those who attempted to redirect or were less synchronized. Regarding intervention-related factors, duration of treatment had an inconsistent effect. Some studies reported improved outcomes with more intervention time and others reported no association. Overall, most studies were not adequately designed or controlled to identify true moderators of treatment response.

KQ 3. Treatment Phase Changes That Predict Outcomes

The reviewed literature offers little information about what specific early changes from baseline measurements of child characteristics might predict long-term outcome and response.

KQ 4. Treatment Effects That Predict Long-Term Outcomes

Few studies assess end-of-treatment effects that may predict outcomes. Several early intensive behavioral and developmental interventions are associated with changes in outcome measures over the course of very lengthy treatments, but such outcomes usually have not been assessed beyond treatment windows. One family of studies attempted to follow young children receiving early joint attention intervention until they were school aged, but this study failed to include adequate followup of control conditions. It also involved children who were receiving many hours of uncontrolled interventions during the course of study.

KQ 5. Generalization of Treatment Effects

The majority of the social skills and behavioral intervention studies targeting associated conditions attempted to collect outcomes based on parent, self, teacher, and peer report of targeted symptoms (e.g., anxiety, externalizing behaviors, social skills, peer relations) at home, at school, and in the community. Although such ratings outside of the clinical setting may be suggestive of generalization in that they improve outcomes in the daily context/life of the child, in most cases, these outcomes are parent reported and not confirmed with direct observation. Behavioral intervention studies rarely measured outcomes beyond the intervention period, and we therefore cannot assume that effects were maintained over time.

KQ 6. Treatment Components That Drive Outcomes

We did not identify any studies meeting our inclusion criteria that addressed this question.

KQ 7. Treatment Approaches for Children Under Age 2 at Risk for Diagnosis of ASD

In the studies addressing interventions for younger children, children who received behavioral interventions seemed to improve regardless of intervention type (including the comparator interventions, which were also behavioral). None of the fair- or good-quality studies compared treatment groups with a no-treatment control group. Potential modifiers of treatment efficacy include baseline levels of object interest. Most outcome measures of adaptive

functioning were based on parent report, and the effect of parental perception of treatment efficacy on perception (and report) of child functioning was generally not explored.

Discussion

Key Findings and Strength of Evidence

Since our previous review in 2011, there has been a significant increase in the quantity and quality of studies investigating behavioral interventions. These new studies add to the prior report and strengthen our ability to make conclusions about the effectiveness of behavioral interventions. Of the 45 comparative studies of behavioral interventions (29 RCTs) in the 2011 review, we considered only 2 as good quality. Among the new studies described in this current review, 19 studies are good quality, and 48 of the 65 included studies are RCTs.

Evidence from the original report and this update suggests that early behavioral and developmental intervention based on the principles of ABA delivered in an intensive ($\geq$15 hours per week) and comprehensive (i.e., addressing numerous areas of functioning) approach can positively affect a subset of children with ASD (Table B). Across approaches, children receiving early intensive behavioral and developmental interventions demonstrate improvements in cognitive, language, adaptive, and ASD impairments compared with children receiving low-intensity interventions and eclectic non–ABA-based intervention approaches.

Since our previous review, there have also been substantially more studies of well-controlled low-intensity interventions aimed at parent training for comprehensive impact on social communication skills. Although parent training programs modified parenting behaviors during interactions, data are more limited about their ability to improve broad developmental skills (such as cognition, adaptive behavior, and ASD symptom severity) beyond short-term language gains for some children.

A growing number of studies of improved quality demonstrated positive effects of social skills interventions on at least one outcome measure, but a lack of consistency in the interventions studied and outcome measures used makes it difficult to understand specific effects of different intervention modalities.

A growing evidence base also suggests that children receiving targeted play-based interventions (e.g., joint attention, imitation, play-based interventions) demonstrate improvements in early social communication skills. Children receiving targeted joint attention packages in combination with other interventions show substantial improvements in joint attention and language skills over time. There is also evidence across a variety of play-based interventions that young children may display short-term improvements in early play, imitation, joint attention, and interaction skills. However, evidence that these short-term improvements are linked to broader indexes of change over time is not substantial.

CBT for associated conditions such as anxiety had the largest number of high-quality studies in the current review. A strong evidence base now suggests that school-aged children with average to above average intelligence and comorbid anxiety symptoms receiving manualized CBT therapy show substantial improvements in anxiety compared with wait-list controls. Table B summarizes the strength of the evidence for each category of intervention.

Table B. Strength of the evidence

Intervention	Outcome	SOE	Study Design Quality (N Participants)	Ratings for Domains Used To Assess SOE; Issues	Key Findings
Early intensive behavioral and developmental intervention: ABA based	**IQ/ cognitive**	Moderate for positive effect	RCT: 1 good, 2 fair (360) Prospective cohort: 6 fair, 2 poor (521) nRCT; 1 good, 4 fair (170) Retrospective cohort: 1 fair, 2 poor (182)	Study limitations: Medium Consistency: Consistent Directness: Direct Precision: Precise Reporting bias: Undetected Other concerns: Approaches across studies vary substantially; it is difficult to determine the effects of these unique studies on specific groups of children.	Young children receiving high-intensity interventions display improvements in aspects of cognitive functioning. Most studies found that children in treatment and comparison groups both improved on cognitive skills, with children in early intensive behavioral interventions (target intervention) improving more than children receiving other types of services (eclectic comparators). Not all improvements were maintained at long-term followup Therefore, SOE was moderate for a positive effect relative to eclectic controls.
	Adaptive behavior	Low for positive effect	RCT: 1 good, 1 fair (76) Prospective cohort: 7 fair, 2 poor (616) nRCT: 1 good, 4 fair (170) Retrospective cohort: 1 fair, 2 poor (182)	Study limitations: Medium Consistency: Inconsistent Directness: Direct Precision: Imprecise Reporting bias: Undetected Other concerns: Behavior was always measured by parent report (Vineland Scales of Adaptive Behavior) rather than objective observation.	Most studies found that children in both treatment and control groups improved on adaptive skills. However, children in early intensive behavioral interventions improved more than children receiving other types of services. Not all group differences were maintained over long-term followup Therefore, SOE was low for a positive effect relative to eclectic controls.
	Symptom severity	Low for positive effect	RCT: 1 good, 1 fair (332) nRCT: 1 good, 1 fair (74) Prospective cohort: 4 fair, 2 poor (470) Retrospective cohort: 1 fair (142)	Study limitations: Medium Consistency: Inconsistent Directness: Direct Precision: Imprecise Reporting bias: Undetected Other concerns: Most control groups were also receiving treatments and also showed improvement, making it difficult to tease apart the effect of intervention.	There was mixed impact on symptom severity. SOE is low for a positive effect on symptom severity because 2 good-quality studies showed positive effects but multiple lower quality studies did not. More studies are needed to confirm results.

Table B. Strength of the evidence (SOE) (continued)

Intervention	Outcome	SOE	Study Design Quality (N participants)	Ratings for Domains Used to Assess SOE, and Issues	Key Findings
Early intensive behavioral and developmental intervention: ABA based	**Language/ commun-ication**	Moderate for positive effect	RCT: 1 good, 2 fair (360) nRCT: 1 good, 3 fair (143) Prospective cohort: 6 fair, 2 poor (616)	Study limitations: Medium Consistency: Consistent Directness: Direct Precision: Precise Reporting bias: Undetected Other concerns: Some studies measured language using direct testing, whereas others only used parent-reported measures (Vineland Scales of Adaptive Behavior).	Most studies found a positive effect of treatment on language/communication skills, although the specific domain of improvement (e.g., receptive vs. expressive language) varied across study. Some initial between-group differences disappeared at long-term followup There is moderate SOE of a positive effect on language overall.
	Social skills/social behavior	Low for positive effect	RCT: 1 good, 1 fair (332) nRCT: 1 fair (34) Prospective cohort: 4 fair, 1 poor (406) Retrospective cohort: 1 fair (142)	Study limitations: Medium Consistency: Inconsistent Directness: Direct Precision: Imprecise Reporting bias: Undetected Other concerns: Social skills were assessed almost exclusively using parent-reported standard scores on the Vineland Scales of Adaptive Behavior.	Many studies found that treatment groups improved more than controls on measures of social skills, although a significant minority did not find any treatment effect. SOE is low for a positive effect at this time because, although positive effects were observed, they were not consistent.

Table B. Strength of the evidence (SOE) (continued)

Intervention	Outcome	SOE	Study Design Quality (N participants)	Ratings for Domains Used to Assess SOE, and Issues	Key Findings
Early intensive behavioral and developmental intervention: parent training	**IQ/cognitive**	Low for no effect	RCT: 3 fair (148) Prospective cohort: 1 good, 1 fair, 1 poor (142)	Study limitations: Medium Consistency: Inconsistent Directness: Direct Precision: Imprecise Reporting bias: Undetected Other concerns: None	Most studies of parent-implemented ABA demonstrated no improvements in IQ relative to community-based interventions; in some studies worse outcomes were reported relative to center-based treatment. SOE is low for no effect due to heterogeneity in interventions and outcomes measured.
	Symptom severity	Low for positive effect	RCT: 3 good, 3 fair (361) Prospective cohort: 1 good, 1 fair, 2 poor, (203)	Study limitations: Low Consistency: Inconsistent Directness: Direct Precision: Imprecise Reporting bias: Undetected Other concerns: The measure of symptom severity varied across studies and was inconsistently defined.	Many studies found that treatment groups had improved ASD symptoms relative to controls.
	Language/ commun-ication	Low for positive effect	RCT: 4 good, 6 fair, 1 poor (664) nRCT: 1 poor (22) Prospective cohort: 2 good, 2 poor (176)	Study limitations: Low Consistency: Inconsistent Directness: Direct Precision: Precise Reporting bias: Undetected Other concerns: A mix of outcome measures was used—both parent reported (Vineland Scales of Adaptive Behavior) and more standardized measures such as Reynell or Mullen scales.	Parent training was associated with improvements in language (low SOE for improvements), but interventions and comparators were different across studies, as were the outcome measures. More studies are needed to confirm results. .
Social skills	**Social skills/ social behavior**	Low for positive effect	RCT: 2 good, 11 fair, 6 poor (730) nRCT: 2 fair (45) Retrospective cohort: 1 poor (117)	Study limitations: Medium Consistency: Inconsistent Directness: Direct Precision: Precise Reporting bias: Undetected Other concerns: Interventions varied widely in terms of scope and intensity.	School-aged children diagnosed without concomitant cognitive and language deficits demonstrated short-term gains in social skills and emotion recognition. Maintenance and generalization of these skills beyond the treatment context had variable results.

Table B. Strength of the evidence (SOE) (continued)

Intervention	Outcome	SOE	Study Design Quality (N participants)	Ratings for Domains Used to Assess SOE, and Issues	Key Findings
Play/interaction based interventions	**Joint attention**	Moderate for positive effect	RCT: 3 good, 6 fair (305)	Study limitations: Low Consistency: Consistent Directness: Indirect Precision: Precise Reporting bias: Undetected Other concerns: Children in several studies were also receiving other early intervention; disentangling results is difficult.	Selected joint attention skills consistently increased in treatment arms, but duration of effects is unclear. The SOE is lowered to moderate, as children in most studies were also receiving other early intervention and disentangling effects is difficult.
	Play skills	Low for positive effect	RCT: 3 good, 3 fair, 3 poor (265) Prospective cohort: 1 poor (12)	Study limitations: Medium Consistency: Consistent Directness: Direct Precision: Precise Reporting bias: Undetected Other concerns: Children in several studies were also receiving other early intervention; disentangling results is difficult.	Play skills increased in treatment arms but duration of effects is unclear. Imitation skills improved in treatment arms in 4 small short-term studies and in the treatment and control arms in 1 study.
	Language/ commun-ication	Low for positive effect	RCT: 4 fair (165)	Study limitations: Medium Consistency: Consistent Directness: Direct Precision: Imprecise Reporting bias: Undetected Other concerns: Children in several studies were also receiving other early intervention; disentangling results is difficult.	Expressive, but not receptive, language skills generally increased in the treatment arms in 2 studies; prompted, but not spontaneous, communication improved in 1 study.
	Social skills	Low for positive effect	RCT: 1 good, 3 fair (173)	Study limitations: Medium Consistency: Consistent Directness: Indirect Precision: Precise Reporting bias: Undetected Other concerns: Children in several studies were also receiving other early intervention; disentangling results is difficult.	Joint engagement or positive affect improved in treatment arms in 3 studies.

Table B. Strength of the evidence (SOE) (continued)

Intervention	Outcome	SOE	Study Design Quality (N participants)	Ratings for Domains Used to Assess SOE, and Issues	Key Findings
Interventions addressing commonly associated conditions: CBT	**Anxiety**	High (for positive effect in older children with at least average IQs)	RCT: 6 good, 1 fair, 2 poor (413) nRCT: 1 fair (31)	Study limitations: Low Consistency: Consistent Directness: Direct Precision: Precise Reporting bias: Undetected Other concerns: Studies included older children, typically with IQ >70.	Improvement in anxiety symptoms was greater for CBT vs. control group in 5/6 studies; study that did not show improvement compared CBT with an active treatment instead of a wait-listed control. Improvements were maintained at followup.
	Symptom severity	Low for positive effect	RCT: 2 good (81)	Study limitations: Low Consistency: Consistent Directness: Direct Precision: Imprecise Reporting bias: Undetected Other concerns: None	There was significant improvement in clinician- and parent-rated measures of anxiety severity in both studies, with improvement maintained at followup. SOE is low based on only 2 small studies.

ABA = applied behavior analysis; CBT = cognitive behavioral therapy; nRCT = nonrandomized controlled trial; RCT = randomized controlled trial; SOE = strength of evidence

Applicability

Studies of early intensive behavioral and developmental interventions were conducted primarily in preschool-age and early school-age children (i.e., typically children initially ages 1.5–7 years). The cognitive, language, and adaptive behavior profiles of participants included in these studies were generally in line with those seen in the community (i.e., typically marked by substantial impairment/delay, but with some children with more intact early cognitive/language profiles).

Often studies were conducted in highly controlled environments (e.g., university-supported intervention trials) or the methodology was not well described (i.e., nonmanualized approaches), which substantially limits their applicability to community-based settings. Even available manualized interventions require high degrees of specialization and training that make them difficult to implement in community practices.

Studies of parent training interventions and play-based interventions for preschool children often emphasized principles of ABA, in accordance with current practice recommendations for the target populations typically referred for these services. Training programs included components to improve social communication skills such as joint attention, play-based interactions, and pragmatic language approaches; interventions were conducted for approximately 1–4 hours/week, with parents trained in how to generalize these skills to other natural settings. Several programs offer manualized intervention protocols that can facilitate their use in community settings. Again, however, the number of providers in community settings who are capable of implementing these programs may be limited.

Most studies of social skills interventions targeted elementary school–aged children (6–13 years old) with few studies targeting preschool-age children, although such interventions may be important in this younger age group. Most studies also excluded children with IQs falling outside of the average range. Similarly, CBT for conditions commonly associated with ASD was targeted toward older children with generally average cognitive abilities and comorbid anxiety disorders.

Limitations of the Review Process

We limited this update to comparative studies and included only those with at least 10 individuals. Thus, we did not include data from pre-post studies or those with a very small number of children. These would include a number of single subject design studies that may be helpful for understanding focused questions of short-term efficacy in individual children and that may be useful for explicating mechanisms of action. These studies are less able to contribute to the body of evidence that we sought on population-level and generalizable effects. Users of this review may want to take those studies into account as context when applying our findings. We limited our review to English-language studies, not finding evidence that we were missing relevant research in other languages. We also did not include interventions primarily viewed as medical, educational, complementary/alternative, or allied health in nature.

Limitations of the Evidence Base

Despite improvements, the existing literature still has significant methodological concerns that in many ways continue to limit the strength of these conclusions. Evidence for the impact of intensive ABA-based interventions on cognitive, language, and adaptive skills and ASD symptoms also highlights important limitations of current treatment modalities. First, even

children who demonstrate clinically significant improvements in these areas often continue to display substantial impairment in these and other areas over time. Second, not all children receiving intensive ABA-based intervention showed robust improvements in these domains. Thus, it is still challenging to predict long-term functional and adaptive outcomes on an individual level. Further, although children receiving early intensive developmental and behavioral intervention commonly display substantial improvements, the magnitude of these effects varies across studies and may indicate subgroups showing variable responses to particular interventions. Intervention response is likely moderated by both treatment and child factors.

Despite multiple studies of early intensive treatments, intervention approaches still vary substantially, which makes it difficult to tease apart what these unique treatment and child factors may be. Similarly, data on provider type and qualifications are variably reported, and the impact of provider characteristics on treatment outcomes is unclear. Study sample sizes are typically small (total numbers ranging from 11 to 284 for studies in the current review, median = 40), and some studies may be considered pilots for larger studies that may better answer questions about intervention intensity and moderators of effects. At this time, the evidence is insufficient to adequately identify and target the children who are most likely to benefit (or not benefit) from specific interventions.

Many early intervention studies found that children in all groups improved on ASD symptom measures regardless of intervention type, although the degree of improvement was often significantly greater in the treatment group. In many studies, results were confounded by nonrandom assignment of participants, including assignment based on child characteristics (such as having the skills necessary to participate in the intervention setting) or parental preference. The latter is especially problematic when outcomes are measured by parent report, given some evidence that parental stress influences parent perceptions of child outcomes. Additionally, in most studies, both enrolled and control/wait-listed children were receiving concomitant interventions, whose magnitude was inconsistently documented and controlled for in analyses.

A remaining significant challenge to interpreting the early intensive intervention literature relates to how interventions are described and implemented. Although researchers are attempting to manualize approaches as well as operationalize and measure treatment fidelity, most of the body of literature categorized in this report as "early intensive behavioral and developmental intervention" remains an eclectic grouping. This category of intervention presently groups different treatment approaches (i.e., developmental, intensive behavioral, center based, and combinations), intensity (12 hours over 3 months vs. 30 hours over 1 week), and duration (weeks to years); varied inclusion and baseline assessment criteria; children of varying ages (intake age ranging from 18 months to 7 years); and many different outcome measurements over different periods of time (weeks to years). Manualizing intensive interventions to be delivered over the course of months and years for a heterogeneous patient population is intrinsically challenging. However, recent progress toward this end has shown that children may respond differentially to early intensive approaches.

Few studies directly compared the effects of well-controlled treatment approaches, instead comparing interventions with nonspecific "treatment as usual," which clearly lacks the level of control for expectancy bias in a placebo-controlled medication study. Additionally, little data on the practical effectiveness or feasibility of these treatments beyond research studies exist, and questions remain about whether reported findings would generalize on a larger scale within communities. Furthermore, the studies conducted have used small samples, drastically different

treatment approaches and duration, and different outcome measurements. Similarly, no studies reported harms of intervention in terms of child, family, or system impact.

Although there was a fairly robust evidence base on CBT, the literature lacks head-to-head comparisons of treatment or controlled comparisons of combinations of treatments, despite the fact that most children are undergoing multiple concurrent treatments. Although the studies are well designed, the sample sizes are quite modest. Additionally, the CBT approaches were modified for children with ASD and often manualized by the study authors themselves.

Research Gaps and Needs

Given the heterogeneity of the expression of ASD across children, a critical area for further research is understanding which children are likely to benefit from particular interventions. To date, studies have failed to characterize adequately the characteristics of interventions (or the children receiving them) in a manner that helps clarify why certain children show more positive responses than others. It is simpler to identify the characteristics of those children who show at most a minimal benefit from a particular treatment, but most existing studies also fail to adequately describe this population. It is possible that meta-analyses of individual patient data may provide additional information for identifying subgroups of responders.

Further, our understanding of early indicators of treatment response is extremely limited, such that it is not realistic to implement evidence-based changes in intervention based on assessing children's responses. This is quite important to parents, providers, and families, as they often want to know not only when a treatment is working, but also when the lack of a robust response should lead them to pursue other treatment options. Similarly, research is lacking on the durability of treatment gains and approaches needed to maintain gains.

Currently, the evidence suggests that some children will show dramatic improvement overall, others will display robust improvement in some areas with continued areas of vulnerability in others, and still other children will show more modest responses to treatment. It is also unclear how similar groups of children would respond to differing levels of intervention intensity, approaches, and methods. Research suggests that child characteristics such as baseline cognitive, language, and adaptive skills and ASD symptoms correlate with treatment outcome regardless of intervention. However, these correlational data provide limited information to predict what treatments will work best for individual children. Intensive comprehensive intervention strategies are often, by their very nature, multicomponent, but little data exist on whether specific treatment components drive effectiveness. Also, little is known about mediators of change. Finally, intervention research often fails to collect data on pragmatic factors related to family, culture, available resources, and stressors that are likely critical to understanding treatment response in a "real-world" context.

Measuring appropriate outcomes is a primary methodologic concern in the ASD literature. Intervention research has typically measured differing outcomes across studies, which has limited the ability to understand change within and across individual studies.[11] Many studies also used problematic methods to operationalize outcomes, doing so in terms of change on standardized measures that reference normative populations (i.e., IQ measurement, adaptive behavior scores). This may not be an appropriate or adequate method for measuring or predicting early treatment response, changes in quality of life, or long-term functional outcomes. Such measurement, while allowing for comparison with typically developing populations, may miss important information about changes that are relevant within the ASD population specifically. More simply, it is unclear that measures of cognitive ability, language, and ASD diagnostic

symptoms are adequately sensitive methods for measuring symptom frequency, intensity, and impairment in children with ASD. Research on appropriate methods for capturing meaningful change will be critical to advancing our understanding of behavioral interventions. In addition, although more studies are reporting primary and secondary outcome measures determined a priori, continued improvements in reporting will benefit the field.

Given that the treatment process for ASD is typically intensive and requires highly specific and well-trained individuals to deliver with fidelity, questions of feasibility and accessibility are pertinent but largely understudied. Our understanding of treatment impact and implementation would be greatly enhanced by research that explicitly evaluates which treatments have the greatest real-world impact. Similarly, evaluations of interventions delivered by community providers are important for comparing effects of such approaches with those of interventions delivered in controlled research environments. Such evaluations are complicated by the complexity of community systems and methodologic challenges, including creating similar treatment and control groups and maintaining fidelity. However, they will be increasingly valuable for scaling intervention for ASD. Also important in addressing this gap is improving our currently limited understanding of the effects of provider training and provider characteristics on outcomes of treatment.

Finally, this literature lacks studies that directly compare interventions or employ combinations of interventions (e.g., comparing medical interventions with behavioral interventions, with educational interventions, or with allied health interventions), despite the fact that most children receive multiple concurrent treatments.

Conclusions

In sum, a growing evidence base suggests that behavioral interventions are associated with positive outcomes for some children with ASD. Despite improvements in the quality of the included literature, a need remains for studies of interventions across settings and continued improvements in methodologic rigor. Substantial scientific advances are needed to enhance our understanding of which interventions are most effective for specific children with ASD and to isolate the elements or components of interventions most associated with effects.

References

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. Fifth ed., Washington DC: American Psychiatric Association; 2013.

2. Zwaigenbaum L, Bryson S, Lord C, et al. Clinical assessment and management of toddlers with suspected autism spectrum disorder: insights from studies of high-risk infants. Pediatrics. 2009 May;123(5):1383-91. PMID: 19403506.

3. Myers SM, Johnson CP. Management of children with autism spectrum disorders. Pediatrics. 2007 Nov;120(5):1162-82. PMID: 17967921.

4. Myers SM. Management of autism spectrum disorders in primary care. Pediatr Ann. 2009 Jan;38(1):42-9. PMID: 19213293.

5. Shattuck PT, Seltzer MM, Greenberg JS, et al. Change in autism symptoms and maladaptive behaviors in adolescents and adults with an autism spectrum disorder. J Autism Dev Disord. 2007 Oct;37(9):1735-47. PMID: 17146700.

6. McGovern CW, Sigman M. Continuity and change from early childhood to adolescence in autism. J Child Psychol Psychiatry. 2005 Apr;46(4):401-8. PMID: 15819649.

7. Fecteau S, Mottron L, Berthiaume C, et al. Developmental changes of autistic symptoms. Autism. 2003 Sep;7(3):255-68. PMID: 14516059.

8. Seltzer MM, Shattuck P, Abbeduto L, et al. Trajectory of development in adolescents and adults with autism. Ment Retard Dev Disabil Res Rev. 2004;10(4):234-47. PMID: 15666341.

9. Warren Z, Veenstra-VanderWeele J, Stone W, Bruzek JL, Nahmias AS, Foss-Feig JH, Jerome RN, Krishnaswami S, Sathe NA, Glasser AM, Surawicz T, McPheeters ML. Therapies for Children With Autism Spectrum Disorders. Comparative Effectiveness Review No. 26. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2007-10065-I.) AHRQ Publication No. 11-EHC029-EF. Rockville, MD: Agency for Healthcare Research and Quality; April 2011. www.effectivehealthcare.ahrq.gov/reports/final.cfm.

10. Methods Guide for Effectiveness and Comparative Effectiveness Reviews. AHRQ Publication No. 10(14)-EHC063-EF. Rockville, MD: Agency for Healthcare Research and Quality; January 2014. Chapters available at www.effectivehealthcare.ahrq.gov.

11. Bolte EE, Diehl JJ. Measurement tools and target symptoms/skills used to assess treatment response for individuals with autism spectrum disorder. J Autism Dev Disord. 2013 Nov;43(11):2491-501. PMID: 23479074.

Introduction

Background

Because no medical or biological marker exists for autism spectrum disorder (ASD), the diagnosis is behaviorally based. Diagnosis is typically established with a combination of history, observation, and/or formal testing, which may include ASD-specific screening and assessment instruments.[1, 2]

ASD is defined in terms of persistent, significant impairments in social interaction and communication as well as restrictive, repetitive behaviors and activities.[3] Social communication and social interaction features include deficits in social-emotional reciprocity (e.g., deficits in joint attention, atypical social approach and response, conversational challenges, reduced sharing of interest, emotions, and affect), deficits in nonverbal communication (e.g., atypical eye contact, reduced gesture use, limited use of facial expressions in social interactions, challenges understanding nonverbal communication), and deficits in forming and maintaining relationships (e.g., diminished peer interest, challenges joining in play, difficulties adjusting behavior to social context). ASD features of restricted, repetitive patterns of behavior, interests, or activities may include stereotyped motor mannerisms, use of objects, or speech (e.g., simple motor stereotypies, repetitive play, echolalia, and formal or idiosyncratic speech); insistence on sameness, inflexible adherence to routines, or ritualized patterns of behavior (e.g., distress at small changes, rigid patterns of thought and behavior, performance of everyday activities in ritualistic manner); intense preoccupation with specific interests (e.g., strong attachment to objects, circumscribed or perseverative topics of interest); and sensory sensitivities or interests (e.g., hyper- or hypo-reactivity to pain and sensory input, sensitivity to noise, visual fascination with objects or movement).[4-6]

ASD symptoms cause impairment across many areas of functioning and are present early in life. However, impairments may not be fully evident until environmental demands exceed children's capacity. They also may be masked by learned compensatory strategies later in life. Many children with ASD may also have intellectual impairment or language impairment, and the disorder may be associated with known medical, genetic, or environmental factors.

Prevalence and Burden of Disease/Illness

The prevalence of ASD in the United States is 14.7 cases per 1,000 (or 1 in 68) children living in the communities surveyed, with rate estimates varying widely by region of the country, sex, and race/ethnicity.[7] Considerably more males (1 in 42) than females (1 in 189) are affected. For some individuals, the core symptoms of ASD (impairments in communication and social interaction and restricted/repetitive behaviors and interests) may improve with intervention and maturation[8-10]; however, core deficits typically translate into varying developmental presentations that remain throughout the lifespan.[11] Longitudinal studies indicate that adults with ASD struggle to obtain adaptive independence.[12-16] The estimated costs of medical and nonmedical care (e.g., special education and daycare) for individuals with ASD are high. One study estimates that the total lifetime societal cost of caring for and treating a person with ASD in the United States is $3.2 million, and about $35 billion yearly for an entire birth cohort of individuals with ASD.[17]

Etiology and Risk Factors

ASD has a strong genetic component, with heritability estimated to be between 40 and 90 percent.[18-20] At least 100 genes are implicated in susceptibility to ASD;[20-22] however, environmental exposures and context also play a role in ASD development and neurogenetic expression.[22, 23] Identification of specific genetic risk variants has been challenging, and many researchers suggest that multiple pathways are involved, including prenatal and postnatal insult.[21] Current research[24, 25]suggests that certain metabolic and other maternal conditions (such as diabetes, hypertension, obesity, and influenza infection) during pregnancy may be associated with increased risk of ASD in offspring. Other studies have investigated the role of advanced maternal and paternal age,[26-28] intrapregnancy interval,[29, 30] pesticide exposure,[31] and exposure to mercury and other heavy metals,[32] among other potential risk factors.

In addition to the potential causative genetic and environmental factors described above, being the sibling of another child diagnosed with ASD increases the risk of receiving an ASD diagnosis from approximately 6.7 to 18.7 percent.[33, 34] This risk varies by gender and increases twofold when two or more older siblings have ASD.

Interventions/Treatment

The manifestation and severity of symptoms of ASD differs widely, and treatments pursued by families include a range of behavioral, psychosocial, educational, medical, and complementary approaches[35-39] that vary by a child's age and developmental status. The goals of treatment for ASD are to improve core deficits in social communication and social interactions and minimize the impact of restricted behaviors, with an overarching goal to help children develop greater functional skills and independence.[5] Treatment frequently is complicated by symptoms or comorbidities that may warrant targeted intervention. There is no cure for ASD and no global consensus on which intervention is most effective.[38, 40] Individual goals for treatment vary for different children and may include combinations of behavioral therapies, educational therapies, medical and related therapies, and allied health therapies; parents may also pursue complementary and alternative medicine (CAM) therapies.

Behavioral approaches are the most common treatment approaches for ASD. In 1987, Ivar Lovaas published findings[41] on a subgroup of children who demonstrated improvements in cognitive abilities and educational placement in response to intensive intervention based on the principles of applied behavior analysis (ABA). As a result, ASD was reconceptualized from a largely untreatable disorder[41] to a condition characterized by plasticity and heterogeneity, where there was hope for higher functioning and better outcomes for children receiving appropriate intervention. Subsequent research focused on social communication and behavioral impairments and used both highly structured approaches and natural/developmental approaches that deliver interventions within natural/everyday contexts (Floortime and the Social Communication Emotional Regulation Transactional Support model), as well as some that integrate these different approaches (Early Start Denver Model [ESDM]). These types of early and intensive treatment programs typically target behaviors and development more broadly, instead of focusing on a specific behavior of interest.[42] Positive effects seen with these approaches in terms of cognition and language have led to the suggestion that beginning intensive therapy at an earlier age may lead to greater improvements.[40, 42, 43] Recent systematic reviews and meta-analyses have highlighted the potential of early intervention to promote behavioral change.[36-39, 43-52]

Other behavioral approaches include interventions focused on joint attention and play, social skills interventions, and cognitive behavioral therapy and other approaches to ameliorate symptoms commonly associated with ASD such as anger or anxiety.

Chronic management throughout different developmental periods is often pursued to maximize functional independence and quality of life by minimizing the core ASD features, facilitating development and learning, promoting socialization, reducing maladaptive behaviors, and educating and supporting families. For many individuals core symptoms of ASD may see improvements with intervention and over time[8-11]; however, deficits typically remain throughout the lifespan, although developmental expression may vary.

Scope and Key Questions

The current systematic review updates our comprehensive review of therapies for children with ASD published in 2011 (available at www.effectivehealthcare.ahrq.gov/ehc/products/106/656/CER26_Autism_Report_04-14-2011.pdf).[39] The 2011 review assessed the literature reporting on any intervention approaches (i.e., behavioral, educational, medical, allied health, and CAM) and included more than 150 unique studies, the majority of which were considered of poor quality. Strength of the evidence for most interventions/outcomes was insufficient, with the exception of moderate and high ratings for the effectiveness and harms of the antipsychotics risperidone and aripiprazole. The strength of the evidence was considered low for the effectiveness of early intensive behavioral and developmental intervention. Positive outcomes from an early and intensive behavioral and developmental intervention were noted in cognitive performance, language skills, and adaptive behavior when the intervention was delivered over substantial intervals of time (i.e., 1–2 years) but at the time, a limited body of comparative evidence led to a low strength of evidence for these effects. Variability in response to such approaches was large, with subgroups of children who demonstrated a more moderated response. The ability to describe and predict these subgroups was limited.

Since the publication of the initial review in 2011, a sizable body of research has been published on behavioral interventions. Additional studies of these interventions have the potential to alter the low and insufficient strength of evidence reported in the original review and potentially affect treatment recommendations.

We recognize that ASD intervention categories overlap substantially, and it is difficult to cleanly identify the category into which an intervention should be placed. We considered multiple approaches for organizing the results with key stakeholders involved in the 2011 review. Ultimately, we defined behavioral interventions to include early intensive behavioral and developmental interventions, social skills interventions, play/interaction-focused approaches, interventions targeting symptoms commonly associated with ASD such as anxiety, and other general psychosocial approaches. This behavioral category does not include interventions that are primarily medical, complementary and alternative interventions, allied health, or educationally focused. We did include some studies that had a primarily behavioral approach combined with another approach (e.g., medical).

We again adopted an approach of assessing effects on core symptoms as well as commonly associated symptoms. Changes in commonly adopted diagnostic criteria related to ASD have changed in the interim since the previous report. These changes include additions to the core symptoms of ASD (e.g., hypo/hyper-sensory reactivity now a core feature).[3] Our approach to the

review encompassed both core and associated symptoms, and neither inclusion nor interpretation was affected by whether specific outcomes were considered core or associated.

Key Questions

As noted, this review is focused on behavioral treatments for children ages 0-12 with ASD or very young children at risk of a diagnosis of ASD. We have synthesized evidence in the published literature to address these Key Questions (KQ):

KQ1: Among children ages 2-12 with ASD, what are the short and long-term effects of available behavioral treatment approaches? Specifically,

KQ1a: What are the effects on core symptoms (e.g., social communication and interaction, restricted and repetitive behaviors), in the short term (≤6 months)?

KQ1b: What are the effects on commonly associated symptoms (e.g., motor, medical, mood/anxiety, irritability, and hyperactivity) in the short term (≤6 months)?

KQ1c: What are the longer-term effects (>6 months) on core symptoms (e.g., social communication and interaction, restricted and repetitive behaviors)?

KQ1d: What are the longer-term effects (>6 months) on commonly associated symptoms (e.g., motor, medical, mood/anxiety, irritability, and hyperactivity)?

KQ2: Among children ages 2-12, what are the modifiers of outcome for different behavioral treatments or approaches?

KQ2a: Is the effectiveness of the therapies reviewed affected by the frequency, duration, and intensity of the intervention?

KQ2b: Is the effectiveness of the therapies reviewed affected by the training and/or experience of the individual providing the therapy?

KQ2c: What characteristics, if any, of the child modify the effectiveness of the therapies reviewed?

KQ2d: What characteristics, if any, of the family modify the effectiveness of the therapies reviewed?

KQ3: Are there any identifiable changes early in the treatment phase that predict treatment outcomes?

KQ4: What is the evidence that effects measured at the end of the treatment phase predict long-term functional outcomes?

KQ5**:** What is the evidence that specific intervention effects measured in the treatment context generalize to other contexts (e.g., people, places, materials)?

KQ6: What evidence supports specific components of behavioral treatment as driving outcomes, either within a single treatment or across treatments?

KQ7**:** What evidence supports the use of a specific behavioral treatment approach in children under the age of 2 who are at high risk of developing ASD based on behavioral, medical, or genetic risk factors?

Organization of This Report

The report describes our review methods including our search strategy, inclusion and exclusion criteria, approach to review of abstracts and full publications, and our method for extraction of data into the evidence table and compiling evidence. We also describe the approach to grading of the quality of the literature and to evaluating the strength of the body of evidence.

The results section synthesizes the findings by category of behavioral intervention (see Categorization of Interventions below). We report the number of comparative studies fully described in the 2011 review, the number and type identified for the current review, and any overlap of studies (i.e., those reporting followup data) between the prior and this current review. We make our conclusions and assess the strength of evidence on the cumulative, comparative evidence across the original report and update.[39]

We differentiate between total numbers of publications and unique studies to bring into focus the number of duplicate publications in this literature in which multiple publications are derived from the same study population. We also integrate discussion of sub-questions within that for each Key Question because there was not adequate distinction in the literature to address them separately. Full details of the results of studies addressed in the prior review can be found in that report.[39]

The report's discussion section expands on methodologic considerations relevant to each Key Question and outlines the strength of the evidence for key outcomes, current state of the literature and challenges for future research on ASD. The report includes a number of appendixes to provide further detail on our methods and the studies assessed. The appendixes are as follows:

- Appendix A: Search Strategies and Results
- Appendix B: Screening and Quality Assessment Forms
- Appendix C: Evidence Tables
- Appendix D: Quality of the Literature
- Appendix E: Excluded Studies
- Appendix F: Characteristics and Outcomes of Studies of Early Intensive Behavioral and Developmental Interventions
- Appendix G: Applicability Summary Tables.

A list of abbreviations and acronyms used in the report follows the References section.

Categorization of Interventions

In line with the 2011 review, we categorized behavioral interventions as follows: early intensive behavioral and developmental interventions, social skills interventions, parent training, play/interaction-focused interventions, interventions targeting symptoms commonly associated with ASD such as anxiety, and other general behavioral approaches. This categorization was largely driven by an end user perspective (i.e., taking into account how parents, clinicians, and

systems of care might attempt to access or support intervention decisions). Thus, we categorized studies based on treatment setting/context rather than outcomes examined.

As noted previously,[39] ASD intervention categories overlap substantially, and it is difficult to cleanly identify the category into which an intervention should be placed.[38] We acknowledge that multiple approaches for organizing the results could be used; however, we retained the categorization used in the 2011 review. We note that alternative approaches are unlikely to change our overall findings either in terms of outcomes or strength of evidence for any category of intervention.

Early intensive behavioral and developmental interventions. We adopted a similar approach to the operationalization of the early intensive behavioral and developmental intervention category as Rogers and Vismara in their review of "comprehensive" evidence-based treatments for early ASD.[43] Interventions in this category all have their basis in or draw from principles of ABA, with differences in methods and setting. ABA is an umbrella term describing principles and techniques used to assess, treat, and prevent challenging behaviors and to promote new, desired behaviors. The goal of ABA is to teach new skills, promote generalization of these skills, and reduce challenging behaviors with systematic reinforcement. The principles and techniques of ABA existed for decades before being specifically applied to the study and treatment of ASD.

We include in this category two intensive interventions that have published manuals to facilitate replication: the University of California, Los Angeles (UCLA)/Lovaas model and the Early Start Denver Model (ESDM). These two interventions have several key differences in their theoretical frameworks and in how they are implemented, although they share substantial similarity in the frequent use of high-intensity (many hours per week, one-on-one) instruction using ABA techniques. They are described together here because of these similarities. We note, however, that the UCLA/Lovaas method relies heavily on one-on-one therapy sessions during which a trained therapist uses discrete trial teaching with a child to practice target skills, while ESDM blends ABA principles with developmental and relationship-based approaches for young children.

The other treatment approaches in this category also incorporate ABA principles and may be intensive in nature; often, however, they have not been documented in a manual. We have classified these approaches broadly as UCLA/Lovaas-based given their similarity in approach to the Lovaas model. A third particular set of interventions included in this category are those using principles of ABA to focus on key pivotal or foundational skills and behaviors (such as motivation to communicate or initiation of communication), rather than global improvements. These approaches often emphasize parent training as a modality for treatment delivery (e.g., Pivotal Response Training, Hanen More than Words, social pragmatic intervention, etc.) and may focus on specific behaviors such as initiating or organizing activity or on core social communication skills. Because they emphasize early training of parents of young children, they will be reviewed in this category.

We utilize the term ABA-based interventions to refer to this overarching, broad grouping of early intensive behavioral and developmental interventions throughout the remainder of the work. As such, it is important to recognize this term reflects a broader category of specific interventions that often vary in terms of approach, scope, and intensity.

Social skills interventions. Social skills interventions focus on facilitating social interactions and may include peer training and social stories.

Play/interaction-focused interventions. These approaches use interactions between children and parents or researchers to affect outcomes such as imitation or joint attention skills or the ability of the child to engage in symbolic play.

Interventions focused on behaviors commonly associated with ASD. These approaches attempt to ameliorate symptoms such as anger or anxiety, often present in children with ASD, using techniques such as Cognitive Behavioral Therapy (CBT) and parent training focused on challenging behaviors.

Additional behavioral interventions. We will categorize approaches not cleanly fitting into the behavioral categories above in this group.

Uses of This Report

This evidence report addresses the Key Questions outlined above using methods described in the following section to conduct a systematic review of published literature.

We anticipate that the report will be of value to clinicians who treat children with ASD, who can use the report to assess the evidence for different treatment strategies. In addition, this review will be of use to the National Institutes of Health, U.S. Centers for Disease Control and Prevention, Centers for Medicare & Medicaid Services, and the Health Resources and Services Administration–all of which have offices or bureaus devoted to child health issues and who may use the report to compare treatments and determine priorities for funding. This report can bring practitioners up to date about the current state of evidence related to behavioral interventions, and it provides an assessment of the quality of studies that aim to determine the outcomes of therapeutic options for the management of ASD. It will be of interest to families affected by ASD because of the recurring need for families and their health care providers to make the best possible decisions among numerous options. We also anticipate it will be of use to private sector organizations concerned with ASD; the report can inform such organizations' understanding of the effectiveness of treatments and the amount and quality of evidence available. Researchers can obtain a concise analysis of the current state of knowledge related to behavioral interventions for ASD. They will be poised to pursue further investigations that are needed to understand best approaches to behavioral therapies for children with ASD.

Methods

Topic Development and Refinement

The 2011 report was nominated by Autism Speaks in a public process. We drafted the initial Key Questions and analytic framework and refined them with input from key informants and a focus group of family members of children with autism spectrum disorder (ASD). After review from the Agency for Healthcare Research and Quality (AHRQ), the questions and framework were posted to a public Web site. After reviewing the public commentary, we drafted final Key Questions and submitted them to AHRQ for review. The need for an update of that report was documented through an ongoing update assessment project at AHRQ.

For the current update, we identified technical experts on the topic of ASD in children to provide input during the project. Technical Expert Panel (TEP) members represented the clinical and research communities from a range of perspectives. TEP members included both researchers and clinicians with expertise in behavioral, social, and psychological issues. To ensure robust, scientifically relevant work, we called on the TEP to provide reactions to work in progress. TEP members participated in conference calls and discussions through email to:

- Refine the analytic framework and Key Questions to ensure that they continued to represent important decisional dilemmas;
- Discuss the preliminary assessment of the literature, including inclusion/exclusion criteria;
- Ensure that we had captured seminal studies addressing interventions for children with ASD.

After discussions with the TEP and our initial scan of the literature, we retained all of the Key Questions (KQ) from the earlier review in the current report, modifying them slightly to reflect a focus on behavioral interventions. The protocol for the current update is available on the AHRQ Effective Health Care web site.

Role of the AHRQ Task Order Officer

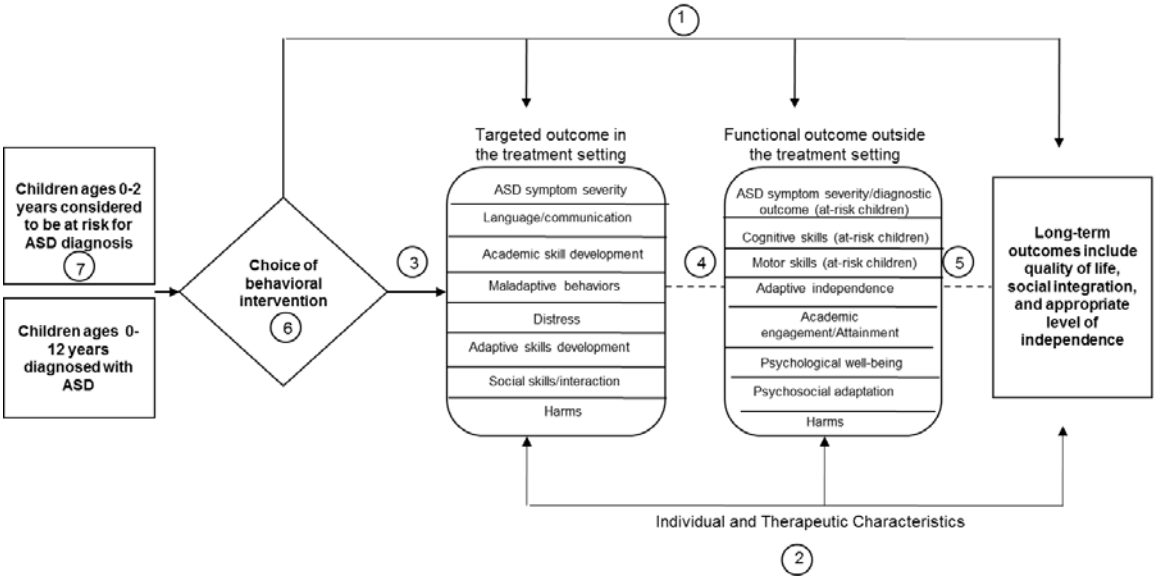
The Task Order Officer (TOO) was responsible for overseeing all aspects of this project. The TOO helped to develop a common understanding among all parties involved in the project, resolved questions and ambiguities, and addressed our queries regarding the scope and processes of the project. The TOO reviewed the report for consistency, clarity, and to ensure that it conforms to AHRQ standards.

Analytic Framework

Figure 1 illustrates the placement of the review's Key Questions within the context of treatment choice, potential outcomes, and characteristics that may affect outcomes. Circled numbers indicate the KQs, and their placement indicates the points in the treatment process where they are likely to arise. This update focuses on behavioral interventions for children with ASD or considered to be at risk for ASD. The population of interest is patients 0–12 years diagnosed with ASD. A child entering treatment may be between the ages of 0 and 2 and at risk for diagnosis of ASD or ages 0 to 12 with a diagnosis of ASD. Diagnoses may occur before age 2; thus the represented age ranges overlap. Individuals engage in behavioral interventions, which may lead to specific outcomes (KQ 1). Outcomes may be modified by characteristics of the child/family or of the intervention (KQ 2). KQ 3 involves identifiable changes early in the treatment process that may affect outcomes. KQ 4 involves the relationship between targeted

outcomes in the treatment setting and functional outcomes outside the treatment setting. KQ 5 involves generalization of interventions to other contexts, and KQ 6 addresses components of treatments that may drive outcomes, the "active ingredients" of treatments. KQ 7 addresses treatments for very young children considered to be at risk for ASD. Target outcomes in the treatment setting include ASD symptom severity, language/ communication, academic skill development, maladaptive behaviors, distress, adaptive skills development, and social skills/interaction. Functional outcomes outside the treatment setting include adaptive independence, academic engagement/attainment, psychological well-being, and psychosocial adaptation; for children considered to be at risk, the outcomes include changes in ASD symptom severity or diagnostic outcome, motor skills, and cognitive skills. Long-term outcomes include quality of life, social integration, and appropriate level of independence. Harms of intervention are also considered.

Figure 1. Analytic framework for behavioral interventions for children with ASD



ASD = autism spectrum disorder; KQ = Key Question

Note: Numbers in circles on diagram represent placement of Key Questions.

Literature Search Strategy

Databases

A librarian employed search strategies provided in Appendix A to retrieve research on interventions for children with ASD. Our primary literature search employed three databases: MEDLINE® via the PubMed interface, PsycINFO® (psychology and psychiatry literature), and the Educational Resources Information Clearinghouse. Our search strategies used a combination of subject heading terms appropriate for each database and key words relevant to ASD (e.g., autism, Asperger). We limited searches to the English language and literature published since the development of the 2011 review.

We also manually searched the reference lists of included studies and of recent narrative and systematic reviews and meta-analyses addressing ASD. We also invited TEP members to provide additional citations.

Grey Literature and Hand Searching

As the review focuses on behavioral interventions, we did not search for regulatory information. As noted, we hand searched the reference lists of included studies and recent reviews.

Search Terms

Controlled vocabulary terms served as the foundation of our search in each database (e.g., MEDLINE vocabulary terms including autistic disorder, child development disorders, pervasive), complemented by additional keyword phrases (e.g., Asperger, autism). We also limited searches to items published in English. Our searches were executed in July 2013. Appendix A provides our search terms and the yield from each database. We imported all citations into an electronic database.

Process for Study Selection

Inclusion and Exclusion Criteria

We developed criteria for inclusion and exclusion based on the patient populations, interventions, outcome measures, and types of evidence specified in the Key Questions and in consultation with the TEP. Table 1 summarizes criteria.

Table 1. Inclusion criteria

Category	Criteria
Study population	Children ages 0–12 with ASD or 0–2 considered to be at risk for ASD based on sibling status or early developmental/behavioral vulnerabilities highly suspicious of ASD
Publication languages	English only
Admissible evidence (study design and other criteria)	Admissible designs Randomized controlled trials, prospective and retrospective cohort studies, and nonrandomized controlled trials Other criteria Studies must be original research studies providing sufficient detail regarding methods and results to enable use and aggregation of the data and results Studies must have relevant population and ≥10 participants with ASD Studies must address one or more of the following for ASD: -Behavioral treatment modality -Predictors of treatment outcomes -Generalization of treatment outcomes to other contexts -Drivers of treatment outcomes Relevant outcomes must be able to be abstracted from data in the papers Data must be presented in the aggregate (vs. individual participant data)

ASD = autism spectrum disorder

Study Population

Studies needed to provide adequate information to ensure that participants fell within the target age range. For studies with populations including individuals with ASD in our target range and over age 12, we retained the study if we could infer that at least 80 percent of the study

participants were in the 0 to 12 age range or if the mean age of participants did not exceed 12 years and 11 months. Similarly, for studies including individuals with ASD and those with other developmental disabilities, we retained the study if we could isolate data on those participants with ASD.

Sample Size

We included studies with at least 10 individuals with ASD between the ages of 0 to 12 years. Our goal was to identify and review the best evidence for assessing the efficacy and effectiveness of therapies for children with ASD, with an eye toward utility in the treatment setting. Interventions to address ASD are frequently behavioral in nature and highly intensive. They are also frequently adapted to be targeted to specific study participants given the significant heterogeneity of individuals with ASD. In part because this makes behavioral research quite complex and intensive, study sizes tend to be very small. A cutoff sample size of 10 provides a balance, allowing us to review and comment on adequate literature for the review but with studies large enough to suggest effects of the interventions.

With the assistance of our technical experts, we selected a minimum sample size of 10 in order to maximize our ability to describe the state of the current literature, while balancing the need to identify studies that could be used to assess treatment effectiveness.

We recognize that the combination of requiring a comparison group and setting a minimum of 10 participants for studies to be included effectively excluded much of the literature on behavioral interventions using single-subject designs.

Single-subject design studies can be helpful in assessing response to treatment in very short timeframes and under very tightly controlled circumstances, but they typically do not provide information on longer term or functional outcomes, nor are they ideal for external validity without multiple replications.[53] They are useful in serving as demonstration projects, yielding initial evidence that an intervention merits further study, and, in the clinical environment, they can be useful in identifying whether a particular approach to treatment is likely to be helpful for a specific child. Our goal was to identify and review the best evidence for assessing the efficacy and effectiveness of behavioral interventions for children with ASD, with an eye toward utility in the treatment setting.

Study Design

We accepted any comparative study designs; that is, any study that included both a treatment/intervention and a separate control group. Control participants could receive an alternate intervention, no intervention/waitlist, or placebo. While we recognize that case series and single-subject design studies can be useful for testing hypotheses or piloting interventions, we did not include such studies as the potential for bias associated with the lack of a control group limits the utility of their findings.

Outcomes

We assessed outcomes in the broad areas of symptom severity, cognitive skills, motor skills, adaptive behavior, language/communication, maladaptive behavior, distress, social skills, and academic attainment. We considered intermediate outcomes as those that occur directly as a result of the intervention and that may also have longer term implications for the ultimate, functional outcomes that are the long-term goal of therapies. We also assessed the harms of

interventions, defined by the AHRQ Effective Health Care program as the totality of adverse consequences of an intervention.[54]

Language

We focused the review on studies published in English. In the opinion of our content experts, most research on ASD is published in English regardless of the native language of the investigators or country of publication.

Screening of Studies

Once we identified articles through the electronic database searches, review articles, and bibliographies, we examined abstracts of articles to determine whether studies met our criteria. Two reviewers separately evaluated each abstract for inclusion or exclusion, using an Abstract Review Form (Appendix B). If one reviewer concluded that the article could be eligible for the review based on the abstract, we retained it for full text assessment.

Two reviewers independently assessed the full text of each included study using a standardized form (Appendix B) that included questions stemming from our inclusion/exclusion criteria. Disagreements between reviewers were resolved by a third-party adjudicator. The group of abstract and full text reviewers included expert clinicians and researchers and health services researchers.

Data Extraction and Data Management

The staff members and clinical experts who conducted this review jointly developed the evidence tables, which were used to extract data from the studies. We used table categories and parameters as outlined in the 2011 review. Tables aim to provide sufficient information to enable readers to understand the studies, including issues of study design, descriptions of the study populations (for applicability), description of the intervention, and baseline and outcome data on constructs of interest.

All team members shared the task of initially entering information into the evidence table. Another member of the team also independently reviewed the articles and edited all initial table entries for accuracy, completeness, and consistency. The full research team met regularly during the article extraction period and discussed issues related to data extraction (e.g., optimal level of detail in the description of the intervention). In addition to outcomes related to treatment effectiveness and modifiers of effects, we extracted all data available on harms. Harms encompass the full range of specific negative effects, including the narrower definition of adverse events.

The final evidence tables are presented in their entirety in Appendix C. Studies are presented in the evidence tables alphabetically by the last name of the first author within each year. When possible to identify, analyses resulting from the same study were grouped into a single evidence table. For those studies reported in the 2011 review and with followup data reported here, the evidence table for the original studies can be found in the 2011 report.[39]

Individual Study Quality Assessment

We used the approach to assessing the quality of individual studies that was developed for the 2011 review and following methods outlined in the AHRQ Effective Health Care program's "Methods Guide for Effectiveness and Comparative Effectiveness Reviews."[55] We assessed the

quality of studies in the domains below using specific questions to evaluate a study's conduct. We rated each domain individually and combined them for an overall quality level as described below and in Appendix D. Three levels were possible: good, fair, and poor (Table 2).

Study design

1. Did the study employ a group design (have a comparison group)?
2. Were the groups randomly assigned?
3. If no, was there an appropriate comparison group?
4. If yes, was randomization done correctly?

Diagnostic approach

1. Was a valid diagnostic approach for ASD used within the study, or were referred participants diagnosed using a valid approach?
   A. A clinical diagnosis based on the DSM, in addition to the ADI-R and/or ADOS assessments.
   B. A combination of a DSM clinical diagnosis with one other assessment tool; or the ADOS assessment in combination with one other assessment tool.
   C. Either a clinical DSM-based diagnosis alone or the ADOS assessment alone.
   D. Neither a clinical DSM-based diagnosis nor the ADOS assessment

Participant ascertainment

1. Was the sample clearly characterized (e.g., information provided to characterize participants in terms of impairments associated with their ASD, such as cognitive or developmental level)?
2. Were inclusion and exclusion criteria clearly stated?
3. Do the authors report attrition?
4. Were characteristics of the drop-out group evaluated for differences with the participant group as a whole?

Intervention characteristics

1. Was the intervention fully described?
2. Was treatment fidelity monitored in a systematic way? (for non-medical interventions)
3. Did the authors measure and report adherence to the intended treatment process? (for medical interventions)
4. Did the authors report differences in or hold steady all concomitant interventions?

Outcomes measurement

1. Did outcome measures demonstrate adequate reliability and validity (including inter-observer reliability for behavior observation coding)?
2. Were outcomes coded and assessed by individuals blinded to the intervention status of the participants?

Statistical analysis

1. For RCTs, was there an intent-to-treat analysis?
2. For negative studies, was a power calculation provided?
3. For observational studies, were potential confounders and effect measure modifiers captured?

4. For observational studies, were potential confounders and effect measure modifiers handled appropriately?

Table 2. Description of study quality levels

Quality Level	Description
Good	Good studies are considered to have the least bias and results are considered valid. A good study has a clear description of the population, setting, interventions, and comparison groups; uses a valid approach to allocate patients to treatments; has a low dropout rate; and uses appropriate means to prevent bias; measure outcomes; analyze and report results.
Fair	Fair studies are susceptible to some bias, but probably not sufficient to invalidate the results. A study may be missing information, making it difficult to assess limitations and potential problems. As the "fair quality" category is broad, studies with this rating vary in their strengths and weaknesses. The results of some fair-quality studies are possibly valid, while others are probably valid.
Poor	Poor studies are subject to significant bias that may invalidate the results. These studies have serious errors in design, analysis, or reporting; have large amounts of missing information; or have discrepancies in reporting. The results of a poor-quality study are at least as likely to reflect flaws in the study design as to indicate true differences between the compared interventions.

Determining Quality Levels

We assessed each domain described above individually and considered the individual ratings to determine an overall quality assessment of good, fair, or poor. We required that studies receive positive scores questions related to study design and diagnostic approach to be considered good quality. Scores were calculated first by domain and then summed and weighted as described in Table 3 to determine overall study quality. Studies could receive up to two points on the domains of study design, diagnostic approach, participant ascertainment, and intervention, and up to one point on the domains of outcome measurement and statistical analysis.

Table 3. Quality scoring algorithm

Definition and Scoring Algorithm	Rating
Score algorithm for internal validity quality rating	
• ≥8/10 points, including a ++ on study design and ++ on diagnostic approach	Good quality
• ≥6/10 points, including at least a + on intervention	Fair quality
• ≤5/10 points	Poor quality

Data Synthesis

We summarized all data qualitatively using evidence tables. We focused on outcomes related to core ASD symptoms (impairments in communication and social interaction and restricted/repetitive behaviors and interests), outcomes including IQ and adaptive behavior, and key symptoms in studies of interventions targeting conditions commonly associated with ASD (e.g., anxiety). For the update, we describe new comparative studies published since the original report, and we make our conclusions and assess the strength of evidence on the cumulative, comparative evidence across the original report and update.

Grading the Body of Evidence for Each Key Question

The assessment of the literature is done by considering both the observed effectiveness of interventions and the confidence that we have in the stability of those effects in the face of future research. The degree of confidence that the observed effect of an intervention is unlikely to

change is presented as strength of evidence, and it can be regarded as insufficient, low, moderate, or high. Strength of evidence describes the adequacy of the current research, both in terms of quantity and quality, as well as the degree to which the entire body of current research provides a consistent and precise estimate of effect. Interventions that have demonstrated benefit in a small number of studies but have not yet been replicated using the most rigorous study designs will therefore have insufficient or low strength of evidence to describe the body of research. Future research may find that the intervention is either effective or ineffective. Strength of the evidence is assessed for a limited set of critical outcomes, typically those related to effectiveness of an intervention. We assessed the strength of the evidence for studies addressing Key Questions 1 and 7, which deal specifically with the outcomes of intervention.

Methods for applying strength of evidence assessments are established in the "Methods Guide for Effectiveness and Comparative Effectiveness Reviews"[55] and are based on consideration of five domains (Table 4): study limitations, consistency in direction of the effect, directness in measuring intended outcomes, precision of effect, and reporting bias. Strength of evidence is assessed separately for major intervention-outcome pairs and incorporates data from the entire body of reviewed evidence on behavioral interventions (i.e., comparative studies—both RCTs and prospective and retrospective cohort studies—reported in the 2011 review[39] and studies reported in the current review). We required at least three fair studies to be available to assign a low strength of evidence rather than considering it to be insufficient. We required at least one good study for moderate strength of evidence and two good studies for high strength of evidence. In addition, to be considered "moderate" or higher, intervention-outcome pairs needed a positive response on two out of the three domains other than study limitations.

Once we had established the maximum strength of evidence possible based upon these criteria, we assessed the number of studies and range of study designs for a given intervention-outcome pair, and downgraded the rating when the cumulative evidence was not sufficient to justify the higher rating. The possible grades were:

- High: High confidence that the evidence reflects the true effect. Further research is unlikely to change estimates
- Moderate: Moderate confidence that the evidence reflects the true effect. Further research may change our confidence in the estimate of effect and may change the estimate
- Low: Low confidence that the evidence reflects the true effect. Further research is likely to change confidence in the estimate of effect and is also likely to change the estimate
- Insufficient: Evidence is either unavailable or does not permit a conclusion.

Table 4. Domains used to assess strength of evidence[a]

Domain	Explanation
Study Limitations	Degree to which included studies for a given outcome have a high likelihood of adequate protection against bias (i.e., good internal validity), assessed through study design and study conduct.
Consistency	Degree to which included studies find either the same direction or similar magnitude of effect. Assessed through two main elements: • Direction of effect: Effect sizes have the same sign (that is, are on the same side of no effect or a minimally important difference). • Magnitude of effect: The range of effect sizes is similar.

Table 4. Domains used to assess strength of evidence[a] (continued)

Domain	Explanation
Directness	Extent to which evidence links interventions directly to a health outcome of specific importance for the review, and for comparative studies, whether the comparisons are based on head-to-head studies. Evidence may be indirect in several situations such as: • Outcome being graded is considered intermediate in a review that is focused on clinical health outcomes (such as morbidity, mortality). • Data do not come from head-to-head comparisons but rather from two or more bodies of evidence to compare. • Data are available only for proxy respondents instead of directly from patients for situations in which patients are capable of self-reporting and self-report is more reliable.
Precision	Degree of certainty surrounding an effect estimate with respect to a given outcome, based on the sufficiency of sample size and number of events. A body of evidence will generally be imprecise if the optimal information size (OIS) is not met. OIS refers to the minimum number of patients (and events when assessing dichotomous outcomes) needed for an evidence base to be considered adequately powered.
Reporting bias	Degree of selective publishing or reporting of research findings based on the favorability of direction or magnitude of effect.

[a] Excerpted from Berkman et al. 2013[56]

Applicability

Finally, it is important to consider the ability of the outcomes observed to apply both to other populations and to other settings (especially for those therapies that take place within a clinical/treatment setting but are hoped to change behavior overall). Our assessment of applicability included determining the population, intervention, comparator, and setting in each study and developing an overview of these elements for each intervention category.

Peer Review and Public Commentary

Researchers and clinicians with expertise in behavioral, medical, social, psychological and educational issues and individuals representing stakeholder and user communities provided external peer review of this report; AHRQ and an associate editor also provided comments. The draft report was posted on the AHRQ Web site for 4 weeks to elicit public comment. We addressed all reviewer comments, revised the text as appropriate, and documented changes and revisions to the report in a disposition of comments report that will be made available 3 months after AHRQ posts the final review on the AHRQ Web site.

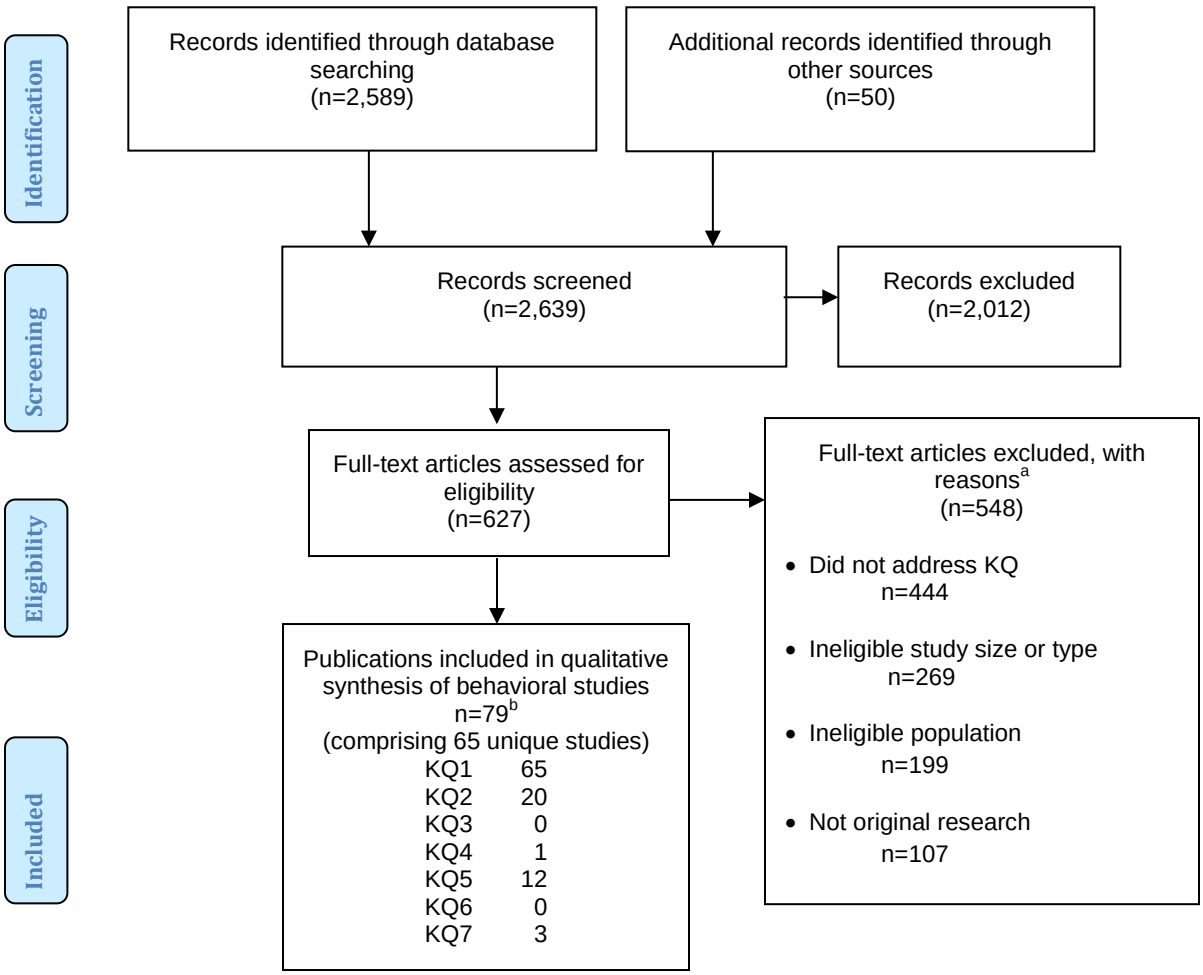
Results

Results of Literature Searches and Description of Included Studies

Article Selection

We identified 2,639 citations and abstracts (Figure 2). We excluded 2,012 studies at abstract review and assessed the full text of 627 studies. Among these, 79 publications, comprising 65 unique studies, met our criteria. Eight of these studies report followup data to papers included in the 2011 review of therapies for children with autism spectrum disorder (ASD). The 65 included studies comprise 48 randomized controlled trials (RCTs) and 17 nonrandomized trials or cohort studies. Table 5 outlines study characteristics. Appendix E includes a list of all studies excluded at the abstract and full-text review stages.

Figure 2. Disposition of studies identified for this review



KQ = Key Question; n = number

[a] Numbers do not tally as studies could be excluded for multiple reasons.

[b] 8 studies among these include followup data from studies reported in the 2011 review.

Table 5. Overview of included studies

Characteristic	RCTs	nRCTs	Prospective Cohort Studies	Retrospective Cohort Studies	Total Literature
	(n=48)	(n=5)	(n=11)	(n=1)	(n=65)
Intervention					
Early intensive behavioral and developmental	12	2	10	1	25
Social skills	11	2	0	0	13
Play-/interaction-based	11	0	1	0	12
Interventions targeting associated behaviors	9	0	0	0	9
Other	5	1	0	0	6
Treatment duration					
<1 month	2	1	0	0	3
≥1 to ≤3 months	24	2	2	0	28
>3 to ≤6 months	12	0	1	0	13
>6 to ≤12 months	8	1	5	1	15
>12 months	2	1	3	0	6
Final followup after end of treatment					
Immediately post-treatment	31	3	9	0	43
≥1 to ≤3 months	8	1	1	0	10
>3 to ≤6 months	4	0	0	0	4
>6 to ≤12 months	1	1	0	0	2
>12 months	4	0	1	0	5
Not reported/unclear	0	0	0	1	1
Study population					
U.S./Canada	33	0	2	1	36
Europe	8	3	7	0	18
Asia	4	0	0	0	4
Other	3	2	2	0	7
Total N participants	2,344	133	660	142	3,279

N = number; nRCT = nonrandomized controlled trial; RCT = randomized controlled trial

Note: Among the 25 early intensive behavioral and developmental intervention studies, four reported followup data from studies addressed in the 2011 review; one social skills study, one play/interaction-based study, and two studies reporting on interventions targeting associated behaviors also reported followup data to studies addressed in the 2011 review.

KQ1. Effects of Behavioral Interventions on Core and Commonly Associated Symptoms in Children With ASD

A wide range of interventions can be classified as behavioral. For the 2011 review and this update, we included studies of early intensive behavioral and developmental interventions, which comprised University of California, Los Angeles (UCLA)/Lovaas-based approaches, the Early Start Denver Model (ESDM), and parent training approaches incorporating principles of Applied Behavior Analysis (ABA) to improve outcomes among young children with ASD; social skills interventions; focal play-based /interaction-based interventions; behavioral interventions focused on commonly associated behaviors; and a small group of other behavioral interventions assessing other interventions in core/associated areas (e.g., sleep workshops).

Early Intensive Behavioral and Developmental Interventions

Key Points

- Of the 25 new studies addressing early intensive behavioral and developmental interventions, eight were good, 13 were fair, and four were poor quality.
- Many studies used parent-report measures of adaptive and ASD symptom-related outcomes, which may be confounded by parental stress, parental involvement in treatment protocols, and nonrandom assignment based upon parental treatment preferences.
- All studies of ABA-based interventions compared a minimum of two treatment groups. No study included a control group that was not receiving some type of intervention (including school enrollment or eclectic community-based therapies, such as medication or occupational therapy), although some limited the number of behaviorally based treatment hours that control participants could receive.
- Studies with parent training components reported improvements in language with inconsistent results for other outcomes.
- No studies reported harms related to children.

Overview of the Literature

In the 2011 review, we identified 17 comparative studies[57-75] (described in 19 papers), of which six were RCTs (two good quality,[73, 75] four fair[57, 69, 71, 72]), five were nonrandomized trials (four fair quality,[64-68, 74] one poor[70]), four were prospective cohort studies (three fair[60, 61, 63] and one poor quality[62]), and two were poor quality retrospective cohort studies.[58, 59] For the current review we identified 25 comparative studies (reported in 37 publications) meeting our inclusion criteria and evaluating either ABA-based early intervention approaches[73, 76-91] or approaches integrating parent training components).[72, 92-109] Four of these studies (published in multiple papers) report followup data for studies reported in the 2011 review.[72, 73, 79, 80, 85-90, 105, 110] Additionally, one study in the current report[95] may include some participants reported in studies in the 2011 review.[111, 112]

ABA-based approaches. Ten studies (reported in 18 publications) assessed ABA-based early intensive behavioral and developmental intervention (Table 6).[73, 76-88, 90, 91, 110, 113] Studies included two RCTs conducted in the United States;[73, 84, 85] two non-randomized controlled trials conducted in Europe;[76, 91] three European,[77-80] one U.S.-based,[83] and one Israeli[81] prospective cohort study; and one Canadian retrospective cohort study that reported on segments of the same population in multiple publications.[86-90, 110] Five studies compared ABA-based approaches to

care-as-usual community therapies[73, 78, 79, 81, 85, 86] and five to preschool-based programs.[76, 77, 83, 84, 91] Mean participant age ranged from 15-72 months. Treatment duration ranged from 6 to 24 months. We rated two studies as good, seven studies as fair, and one study as poor quality.

Parent training. We identified 15 studies (reported in 19 publications) of early intervention with parent training components (Table 7).[72, 92-109] Studies included five European[95, 97, 101, 102, 108] and one Australian[100] prospective cohort studies; four RCTs conducted in the United States or Canada,[93, 98, 103, 104, 107, 109] two (including one crossover) in Asia,[92, 99] one in Australia,[96] and two (one with suboptimal randomization) in Europe.[72, 94, 105] Seven studies compared parent training to treatment as usual (community-based intervention).[72, 92-,94, 98, 101, 102, 105- 107] Five compared ABA-based parent training to other parent-training paradigms[97, 100, 103, 104, 108, 109] or multiple other interventions,[95, 96] and the comparison arm in one study received no specific intervention.[99] Mean participant age ranged from 14 to 81 months. Treatment duration ranged from 12 weeks to 2 years. We rated six studies as good, six studies as fair, and three studies as poor quality.

Detailed Analysis

ABA-Based Approaches

One fair quality RCT examined the use of the Learning Experiences and Alternative Program for Preschoolers and Their Parents (LEAP) protocol in preschool classrooms in the United States.[84] The study compared 27 classrooms (n children=177; mean age: 50.1 months±4.6 months) with teachers trained in the full LEAP curriculum (including peer mediated social skills, incidental teaching, pivotal response training, the Picture Exchange Communication System (PECS), and positive behavior support) to 23 classrooms (n children=117; mean age: 50.7 months±4.2 months) where teachers received the LEAP manual but no formal training. Both groups received an average of 17 hours per week of intervention over two years. Relative to the manuals-only group, children in the full LEAP training classrooms showed significant ($p < .05$) improvement on investigator-rated Childhood Autism Rating Scale (CARS) scores, language, cognitive, and social skills measures. The students of teachers rated as having better intervention fidelity showed better outcomes on all measures.

Five additional studies (reported in multiple publications) examined the use of school-based ABA programs (one fair quality nonrandomized controlled trial and four fair quality prospective cohort studies. [76-77, 78, 81-83] All five compared standard special education preschool curriculums to special education preschools with some sort of enhanced intervention modality, including general ABA,[81, 82] individual UCLA/Lovaas-based behavioral intervention,[76, 78] Treatment and Education of Autistic and Communication related handicapped Children (TEACCH)- or LEAP-programs,[83] and a mix of behaviorally-based operant conditioning techniques.[77] Mean treatment intensity ranged from 13.8-28.38 hours per week, with length of enrollment varying from 8-24 months. Mean child ages ranged from 25.1-53.5 months.

The effects of enhanced school-based interventions relative to standard special education preschool curricula were mixed. Some studies[76-78] found that the enhanced intervention groups showed greater gains in cognitive outcomes and parent-reported adaptive skills. Other studies found that children in all groups improved on cognitive, adaptive, and ASD symptom measures[76, 81-83] regardless of intervention type, although in some cases treatment groups showed greater improvements.[76] Others found declines in both groups on standardized scores of motor skills.[81, 82] Intervention efficacy was associated with baseline cognitive scores in one study of TEACCH classrooms,[83] with lower baseline cognitive scores associated with more improvement.

Lower baseline ASD severity was associated with parent-reported cognitive and adaptive growth for children who received eclectic vs. ABA intervention, but not with standardized test scores.[81, 82] Additional UCLA/Lovaas-style intervention over-and-above classroom involvement was associated with reduced ASD symptoms as rated by clinicians on the CARS[78] but not as rated by parents using the Scale of Pervasive Developmental Disorder in Mentally Retarded Persons.[76] Where examined, total hours of intervention per week were not associated with cognitive or adaptive outcomes, although hours were similar across intervention groups within each study (e.g., comparing half-day programs to other half-day programs).

Four studies (reported in multiple publications) compared ABA-based early intervention to eclectic treatment as usual.[73, 79, 80, 85-91, 110] One good quality RCT compared ESDM to community-based interventions.[73, 85] It randomized children into two groups based on gender and IQ. For two years, 24 children in the ESDM arm (mean age: 23.9±4.0 months at study entry, mean IQ: 61.0±9.2) received 1:1 therapist-delivered manualized intervention (mean of 15.2±1.4 hours/week) as well as parent-delivered treatment (mean 16.3±6.2 hours/week). The comparison group of 21 children (mean age: 23.1±3.9 months, mean IQ: 59.4±8.6) received individual (mean 9.1 hours/week) and group (mean 9.3 hours/week) therapies, including speech-language therapy, occupational therapy, and developmental preschool enrollment. The ESDM intervention targets social communication and engagement as well as general child development. After one year of treatment, The ESDM group showed significantly greater improvement in IQ but not adaptive behavior. After two years of treatment, the ESDM group continued to show significantly more IQ improvement as well as receptive and expressive language. Both groups improved in all domains of adaptive behavior but socialization, with greater improvements in the ESDM group. Neither group showed significant differences in Autism Diagnostic Observation Schedule (ADOS) severity scores or repetitive behavior, although the ESDM group demonstrated a diagnostic shift toward a milder diagnosis (PDD-NOS) at followup. Electroencephalography (EEG) measures of engagement and cognitive processing for children in the ESDM group with usable data were comparable to typically developing children.

A good quality non-randomized trial from Europe[91] compared children (mean age=62.52±16.96 months) with ASD and co-occurring intellectual disability receiving school-based ABA therapy (n=20) to a matched control group of children receiving care-as-usual (e.g., enrollment in TEACCH classrooms, PECS; n=20). The intervention group received one-to-one treatment (mean=4.98 hours, SD=1.45; range: 1.32-7.11) from master's level interventionists. Eleven participants received 2 years of treatment and 9 participants received only one year due to funding loss and school noncompliance. Independent ratings indicated high treatment fidelity (90.3%). Monthly meetings between therapists and parents and teachers provided them with strategies on skill instruction and maintenance.

Cognitive, adaptive, and language skills, and ASD symptoms, were assessed at 12- and 24-months after starting treatment. Both the treatment and control groups showed significant improvement from baseline to 12-month and from 12-month to 24-month followups in developmental age, adaptive skills, and receptive language, with the treatment group showing significantly more improvement than the control (p values<.04, effect sizes ranging from 1.09-2.61). The treatment group showed significant improvements in IQ (p<.001, effect size=.40) between baseline and the 12-month assessment but not the 24-month assessment, whereas the control group did not show significant IQ gains at either time point. Fifty-five percent of treatment group participants showed reduced levels of intellectual disability post-treatment versus 5 percent in the control group. The treatment group (but not the control group) also had

reduced ASD symptoms as measured by the CARS and ADOS (p values<.01, effect sizes 1.50-1.51). Neither group significantly improved in expressive language. Multiple baseline child factors were significantly correlated with progress over time, including developmental age, hours of treatment per week, IQ, adaptive and play skills, and receptive language.

A fair quality Canadian retrospective cohort study[86-90, 110] matched children receiving a large-scale, publicly funded, community-based early intensive intervention program that incorporated ABA, discrete trial training, and naturalistic approaches (n=61, mean age=42.93±11.53 months) to waitlisted children receiving care-as-usual (n=61, mean age=42.79±10.51 months). The intervention group received treatment (mean 25.81±3.44 hours/week) conducted by trained instructor therapists in specialized centers, preschools, and the home environment. The control group received a mean of 17.9±12.3 hours/week of school-based services and <10 hours/week of behavioral intervention conducted by community-based interventionists in community settings. The approaches included low-intensity ABA, speech and occupational therapy, and behavioral consultation. Children in the treatment arm were enrolled in treatment longer (mean=27.84±8.11 months) than children in the waitlist group (mean=17.01±2.81months), and analyses controlled for this difference.

ASD severity improved for the treatment group compared with control, as did Vineland composite standard and ratio scores and IQ estimates (p values≤.033, effect sizes ranging from 0.53 to 0.83). Although treatment group participants had cognitive scores an average of 19 points higher than controls at followup, this should be interpreted with caution due to a lack of baseline cognitive data. Outcomes were related to age at enrollment, treatment duration, and higher baseline adaptive scores, with duration becoming nonsignificant after accounting for group membership (correlation of duration, group=.57, p<.01). A significant interaction emerged between age at enrollment and group membership, with younger starting age influencing outcomes for the treatment group but not control. Analyses including participants in the cohort study and additional participants found that younger age at intake, higher initial developmental levels[90] and treatment intensity[88, 90] were related to treatment outcomes.

Additional analyses of some children in these earlier Canadian studies (overlap not clear) assessed the effects of baseline age and IQ on cognitive and adaptive outcomes in 207 children, and, in a separate analysis of matched older and younger children, effects of baseline age on the same outcomes.[110] In the initial retrospective analysis of 207 children, participant ages at intake ranged from 2 to 14.5 years, IQ from 10 to 104, and mental age from 3 months to roughly 7.5 years. Higher baseline IQ and younger age were significantly associated with greater cognitive rate of change (pre-post change in mental age/time in intervention) and with higher IQ at followup (all p<.001), but change in IQ was not significantly associated with higher initial IQ. Higher baseline IQ was also associated with higher adaptive behavior scores at followup (p<.001), but age was not a significant predictor. Longer duration of intervention was associated with slower rate of IQ and adaptive behavior development (p values ≤.01); however, as this analysis was not prospective, the children who received more intervention could have been making slower progress. In the analysis of older (n=60, age 6-13.58 years at baseline) and younger (n=60, age 2.08-5.92 at baseline) children matched on developmental trajectory (i.e., number of intervention hours, baseline IQ and adaptive behavior), younger children had significantly better followup IQ outcomes compared with the older group. Younger children gained an average of roughly 17 IQ points (effect size=0.80) while older children gained an average of 2 points. Cognitive rate improved significantly for younger (effect size=3.19) but not

older children. Both groups improved over time in adaptive behavior, but differences between groups were not significant (improvement of 4 points in younger children and 5 in older).

Finally, a poor quality UK study[79, 80] compared the long-term effects (2 years post-treatment) of 1:1 home-based early intervention (both university-provided and privately-provided) to community-based treatment-as-usual, including PECS, TEACCH, and medication. The early intervention group included 23 children (mean age=35.7±4 months; mean IQ=61.43±16.43 months), and the community-based group included 18 (mean age=38.4±4.4 months; mean IQ=62.33±16.64) at the two-year followup, with children in the community-based group significantly older at the start of treatment ($p < .05$). For 24 months, children in the early intervention group received an average of 25.6 hours/week of ABA-based intervention using discrete trial training in the home environment, whereas children in the community-based arm received an unspecified amount of eclectic treatment. After 24 months of intervention, IQ, mental age, and language comprehension/expression improved significantly for the ABA group versus community-based ($p \leq .05$; effect size for IQ change=0.77). At the two year followup, IQ gains were only maintained for children who received privately-provided ABA-based intervention. IQ remained stable for children in the community-based group and significantly declined for children who received university-provided intervention (effect size=.49). This result is confounded by nonrandom assignment and the fact that at baseline, the university-based group had higher levels of ASD symptoms, lower levels of adaptive behavior, and fewer total intervention hours.

Table 6. Key outcomes of ABA-based early intervention studies

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	Key Outcomes
Peters-Scheffer et al. 2013[91] Netherlands **G1:** Low intensity Lovaas-based intervention+specialized preschool, 20/20 **G2:** Specialized preschool, 20/20 Quality: Good	**G1+G2:** 62.52±16.96 (median) **G1:** 40.66±20.1 **G2:** 40.14±18.3	• 9/20 participants in G1 received 1 year of treatment vs. 2 years • Developmental age in both groups improved over time, but increase was greater in G1 vs. G2 (p=.001); effect size for change=1.09 • IQ improved significantly from baseline to 12 months (mean 40.66 to 48.17, P<.001) in G1 and remained stable from 12-24 months; no significant change over time in G2 (baseline mean=40.14, 24-month mean=39.42); effect size for change=0.40 • Total Vineland and subscale scores improved in both groups with greater improvements in G1 vs. G2 (p values<.001); effect size for change in total score=1.74 • Receptive language improved at 24 months in G1 vs. G2 (p=.04); expressive language improve over time in both groups but between group differences at 24 months were not significant (effect size for change=0.40) • Both groups generally improved over time on Early Social Communication Scales domains but between group differences were not significant at 24 months • Severity ratings (CARS, ADOS) decreased significantly over time for G1 but not G2; effect size for change in ADOS=1.51, CARS=1.50) • Differences between groups in measures of emotional and behavioral problems and behavioral flexibility were not significant • More G1 participants achieved clinical and reliable significant on developmental age, adaptive behavior, interpersonal relationships, play and leisure time, receptive and expressive language, ASD severity, and responding to social interaction vs. G2 • More G2 vs. G1 participants obtained clinical and reliable significance on measures of problem behavior and maternal stress; equal numbers of G1 and G2 participants obtained clinical and reliable significance on IQ, behavioral flexibility, joint attention, behavioral requests, and initiating social interaction • Diagnoses changes from autism to PDD-NOS in 45% of G1 and 20% of G2; 10% in G1 classified as non-autistic at 24 months (0 in G2); level of intellectual disability declined in 55% of G1 and 5% of G2 • Baseline hours of treatment, developmental age, IQ, level of adaptive behavior, play skills , receptive language significant predictors of progress

Table 6. Key outcomes of ABA-based early intervention studies (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	Key Outcomes
Dawson et al. 2012[73, 85] US **G1:** ESDM, 24/24 **G2:** Community-based interventions, 24/21 Quality: Good	**G1:** 23.9±4.0 **G2:** 23.1±3.9 **G1:** 61.0±9.2 **G2:** 59.4±8.6	1 year outcomes: • Significantly greater improvement in IQ for G1 (54 vs. 22 points) compared with G2 • No adaptive behavior differences 2 year outcomes: • Significantly more improvement in G1 vs. G2 on IQ; receptive language, and expressive language • Adaptive behavior improvements in both groups (all domains except socialization); significantly greater improvements in G1; no change in ADOS severity scores or repetitive behavior • Diagnostic shift toward milder diagnosis (PDD-NOS) greater for ESDM group • No differences between groups in EEG measurements of perceptual face processing • EEG measures of engagement/cognitive processing comparable to those of typically developing children for G1 children with usable EEG data; 11/15 G1 participants and 4/14 G2 showed faster neural response to faces vs. objects
Boyd et al. 2013[83] US **G1:** TEACCH preschools, 85/81 **G2:** LEAP preschools, 54/48 **G3:** Non-model specific preschools, 59/56 Quality: Fair	G1: 48±6.84 G2: 47.52±8.4 G3: 48.84±7.68 NR	• Groups differed at baseline on ASD characteristics and severity (p=.0013), communication (p<.001), parent-rated reciprocal social interaction (p=.0241) and fine motor (p=.0066) composite scores • All groups showed significant change over time on ASD characteristics and severity, fine motor, and communication composites (p values ≤.05); G1 and G2 improved on teacher-rated reciprocal social interaction (p≤.05). G1 improved on parent-rated reciprocal social interaction (p<.05) • No significant differences among groups on any measure at followup • Children with higher Mullen scores made fewer gains in G1; children with high Preschool Language Scale scores at baseline had higher communication and ASD characteristics and severity composite scores in G1 • Females in G2 had smaller communication gains, although few females in study overall (n=33)

Table 6. Key outcomes of ABA-based early intervention studies (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	• Key Outcomes
Eldevik et al. 2012[77] Norway **G1:** Preschool-based early intensive intervention, 31/31 **G2:** Usual care preschool, 12/12 Quality: Fair	**G1:** 42.2±9.0 **G2:** 46.2±12.4 **G1:** 51.6±16.9 **G2:** 51.7±18.1	• Greater gains in cognitive outcomes (p=.004) and overall adaptive behavior (p=.036), Vineland communication (p=.034) and socialization (p=.008) for G1 vs. G2; no significant differences in Vineland daily living skills between groups • Effect size for change in IQ=1.03 (95% CI: .34 to 1.72) and for change in overall adaptive behavior=.73 (95% CI: .05 to 1.36) • Baseline age and PDD-NOS or Asperger diagnosis correlated with larger gains in overall adaptive behavior, communication, and daily living skills; baseline IQ positively correlated with Vineland socialization gains
Eikeseth et al. 2012[78] Norway/Sweden **G1:** Early intensive intervention, 35 / 13-15 depending on outcome **G2:** Standard care , 24 / NR Quality: Fair	**G1:** 3.9±0.9 years **G2:** 4.4±1.2 years Vineland age equivalent: **G1:** 1.9±0.9 **G2:** 2.1±0.8	• G1 scored significantly higher on all Vineland scales as compared withG2 (p<0.05) with an effect size of Total (composite)=0.92, Communication=1.08, ADL=0.71, Socialization=0.75,Motor=0.70, and Learning rate=0.97 • G1: CARS scores continued to decrease significantly during the second year of treatment (from 31.8 (SD=8.5) to 27.2 (SD=6.2), p<.05), effect size of 0.59 • Children receiving G1 scored significantly higher on standard scores of adaptive behavior. • Significant improvements were found in maladaptive behaviors and excess and deficit behaviors as compared with G2 • Largest gains were observed during the first year. Effect size on all measures at year one were moderate to large
Flanagan et al. 2012[86-88, 90, 110] Canada **G1:** Intensive behavioral intervention, 61/61 **G2:** Wait list control (matched by age), 61/61 Quality: Fair	**G1:** 42.93±11.53 **G2:** 42.79±10.51 NR	• In 2008 retrospective case series (Perry 2008) reporting on ~30% of G1 participants ASD severity (CARS), cognitive level, adaptive behavior, and rate of development improved significantly (all p <.001); outcomes varied across children: approximately 25% showed substantial improvements, 30% showed clinically significant improvement, 19% showed some/modest improvement, 25% showed no improvement or worsening of outcome. Analyses of a subset of the total participants (n=89) showed similar improvements (Freeman 2010) • Age (younger at baseline), IQ, adaptive behavior, and ASD severity were correlated with outcome; IQ was strongest predictor, accounting for 5-12% of the variance in outcomes (Perry 2011); in sub-set analysis (Shine 2010), duration of intervention also associated with better outcomes • ASD severity improved for G1 vs. G2 as did Vineland composite

Table 6. Key outcomes of ABA-based early intervention studies (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	• Key Outcomes
		standard and ratio scores and IQ estimates (p values≤.033, effect sizes ranging from 0.53 to 0.83); 19 point difference in IQ at end of intervention in favor of G1 • Younger age at intervention and higher adaptive skills associated with better outcomes; adaptive skills also associated with better outcomes for G2. Duration of intervention became nonsignificant after intervention type was entered into statistical models (Flanagan 2012) • In retrospective analyses (Perry 2013), higher baseline IQ predicted gains in IQ, and children starting early intervention at younger ages (2-5 years) gained significantly more IQ points (mean 17 points vs. mean 2 points) than children entering intervention at older ages (6-13 years); differences in adaptive behavior gains were not significant
Strain et al. 2011[84] US **G1**: LEAP program with coaching and training, 28 classrooms (27 analyzed)/177 children **G2**: LEAP intervention manuals only, 28 classrooms (23 analyzed)/117 children Quality: Fair	**G1:** 50.1±4.6 **G2:** 50.7±4.2 **G1:** 59.6±6.9 **G2:** 63.2±6.6	• Significant gains on CARS, language, cognitive, and social skills measures for G1 vs. G2 (P<.05) • G1 improved by 18.5 points compared with 9.4 for G2 on the Preschool Language Scale (effect size difference=0.92, p<.01) • G1 improved by 28.6 points compared with 12 for G2 on socials skills rating (effect size difference=1.22, p<.01) • Greater intervention fidelity associated with better outcomes on all measures
Itzchak et al. 2011[81, 82] Israel **G1:** ABA-based approach, 45/45 **G2:** Eclectic approach, 33/33 Quality: Fair	**G1:** 25.1±3.9 **G2:** 26.0±4.6 **G1:** 72.2±19.2 **G2:** 73.3±22.2	• Cognitive abilities (Mullen Scales) and overall Vineland raw and standard scores improved in both groups (p<.05) over time; no significant differences between groups at followup • Vineland motor skills domain decreased over time for both groups (p<.001),with greater decline for those with higher severity; children in G1+G2 with lower severity (ADOS) improved significantly more than those with higher severity on cognitive and adaptive measures; G2 participants with lower severity improved significantly on Vineland communication and socialization measures compared with G1 (p<.001) • In analyses combining G1 and G2, higher cognitive abilities at baseline,

Table 6. Key outcomes of ABA-based early intervention studies (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	• Key Outcomes
		particularly verbal abilities, and older maternal age were associated with greater adaptive skills at followup (p<.05); among those with greater severity, greater verbal ability was associated with better adaptive skills at followup (r=.672, p<.001); cognitive gains greater for those with lower severity (p<.01) and older, more educated mothers (p values <.001, .05); younger children had a better chance of cognitive improvement with intervention (p=NS)
Peters-Scheffer et al.2010[76] Netherlands **G1:** Specialized preschool +UCLA/ Lovaas-based intervention, 12/12 **G2:** Specialized preschool, 22/22 Quality: Fair	**G1:** 53.5±5.52 **G2:** 52.95±11.14 **G1:** 47.00±10.33 **G2:** 45.73±15.99	• Both groups improved over time on cognitive and adaptive measures; G1 improved significantly compared with G2 on IQ/developmental age and Vineland composite, communication, daily living, and socialization domains (all p≤.02) • G2 had greater emotional and behavioral problem scores at baseline vs. G1 (p<.05), changes in scores not significant for either group over time • Decreases in symptom severity not significant between groups

Table 6. Key outcomes of ABA-based early intervention studies (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	Key Outcomes
Kovshoff et al. 2011[79, 80] UK **G1:** Early intensive intervention (publicly-funded or privately purchased), 23/23 **G2:** Usual care, 21/18 Quality: Poor	**G1:** 35.7±4.0 **G2:** 38.4±4.4 **G1:** 61.43±16.43 **G2:** 62.33±16.64	• Groups differed significantly on age at baseline (p<.05); IQ, mental age, and language comprehension improved significantly for G1 vs. G2 after 24 months of intervention (p≤.05); effect size for IQ change=0.77 • Vineland daily living and motor skills scores improved for G1 vs. G2 (p<.05) but composite, communication, severity, and socialization scores did not differ significantly between groups at the 24 month followup • Parents noted more positive social behavior for G1 vs. G2 at the 24 month followup; responders had higher IQ, higher mental age, higher Vineland composite, communication, and socialization scores, lower motor skills, more behavior problems, and more autistic symptoms and fewer hours of intervention in Year 2; at 2-year followup no significant group differences in IQ, adaptive behavior, communication, socialization, or behavior; more G1 participants achieved standard score on receptive language measure vs. G2 (p=.048) • In analyses of G1 participants in privately purchased vs. publicly funded early intensive intervention programs, IQ declined for publicly funded group compared with control or privately purchased participants (p<.0001); privately purchased participants maintained IQ and adaptive behavior gains from end of intervention to the 2 year followup. Publicly funded group had more severe ASD symptoms, lower adaptive behavior, and received less intensive intervention than the privately purchased group

ABA = applied behavior analysis; ADOS = Autism Diagnostic Observation Schedule; ASD = autism spectrum disorder; CARS = Childhood Autism Rating Scale; G-group; IQ = intelligence quotient; LEAP = Learning Experiences and Alternate Program for Preschoolers and their Parents; N = number; PDD-NOS = Pervasive Developmental Disorder-Not Otherwise Specified; SD = standard deviation; TEACCH = Treatment and Education of Autistic and Related Communication-Handicapped Children

Parent Training Approaches

One good quality RCT examining parent training[96] was conducted in Australia and compared two variations of the Building Blocks® program—home or center-based-- to waitlisted controls. The program targeted social and communication skill development. Mean child ages at enrollment ranged from 41.5 to 43.7 months. Mean IQs ranged from 57-66. Treatment duration was 40 weeks. Not all enrolled children had autism spectrum diagnoses; the breakdown was 100 percent of the home-based group, 82.8 percent of the center-based group, and 78.6 percent of the control group. To be enrolled in the center-based group, children had to have a baseline level of "social maturity," a lack of "high levels" of problem behavior, and parents willing to attend sessions. The home-based group (n at followup=27) received individualized 2-hour visits every 2 weeks in the home environment. Center-based children (n=29) received weekly manualized, 2-hour, center-based sessions in small groups of 4 to 6 children, as well as parent training and a parent support group. The control group (n=28) comprised a non-randomized treatment comparison waitlist. All groups received concomitant additional interventions classified as educational (home-based: 2.37 interventions±1.28; center-based: 2.41±1.50; control: 3.11±1.64) or ASD-specific (home-based: .22±.42; center-based: .14±.35; control: .54±.79). Providers were multidisciplinary teams of teachers, speech-language pathologists, occupational therapists and psychologists.

Children in all three groups showed significant improvements in Vineland Communication scores. Compared with the home-based group, children receiving center-based intervention had significantly greater improvement in language comprehension and expression as measured by the Reynell Developmental Language Scales. Waitlisted children had significantly greater improvements in followup Vineland Socialization scores than children in either treatment group. No other significant differences emerged among the three groups on other child outcomes. When analyses were limited only to children with autism spectrum diagnoses, the magnitude of the effects increased, but the presence of statistical significance did not change.[96]

Another good quality RCT from the United States [109] compared the language development of two groups of children with ASD diagnoses, one whose parents received training in a component of ABA, Pivotal Response Training (n=20, mean age=29.5 months, SD=6.9), and another whose parents received training in PECS (n=19, mean age=28.9, SD=4.2). Exclusion criteria included having more than nine intelligible words and having primary diagnoses of intellectual disability, neurological pathology or major sensory impairment. Participants were matched on word use, age, and cognitive functioning. Over the course of 23 weeks, parents completed weekly or biweekly 2-hour parent training sessions from doctoral students. Participants received one-on-one treatment in the home (mean=247 hours, range=181-263) from undergraduate student therapists. Therapist and parent-educator fidelity was maintained at 80 percent. Participants continued to receive outside interventions (e.g., speech therapy) and this was monitored via weekly parent report, with no significant between-group differences emerging.

Outcome variables were assessed at intake, immediately post-treatment, and three months post-treatment. Not all post-treatment coders were blind to participant condition, but no differences were found across blinded vs. not blinded sites. Data were not available on all participants at followup (n=38 for Mullen Scales of Early Learning, 35 for MacArthur Communicative Development Inventories, 35 for Vineland). No differences emerged between Pivotal Response Training and PECS groups. Both improved similarly on all variables over time, with effect sizes across collapsed groups of .216 for expressive communication (Mullen Scales of Early Learning; $p<.001$), .486 for words produced (MacArthur Communicative Development

Inventories; p<.001), and .110 for adaptive communication skills (Vineland; p=.037). The authors reported significant variability in participants' responses to treatment. Parent satisfaction post-treatment was similar across groups, with the only significant difference being the parent-reported difficulty of PECS (p=.005).

Two prospective cohort studies also received good quality ratings. The first was conducted in Australia[100] and compared professional-led parent training (n=17; mean child age, 36.38 months±7.54; 88.2% male) to a self-directed video-based parent intervention (n=22; mean=35.71 months±6.92; 72.7% male). Nearly 80 percent (77%) of participants were diagnosed with autism and the rest with an ASD. Mean IQ was 53.06±9.06 for the professionally led group and 52.86±6.53 for the video-based group. Exclusion criteria included being enrolled in early intervention, passing the Modified Checklist for Autism in Toddlers (M-CHAT), or receiving more than 20 hours/week of services. No information was provided about manualization.

In the professionally led group, parents attended a two-day group workshop and completed a series of 10 hour-long home visits, which occurred two times a week for 5 to 6 weeks. These visits focused on parental stress and child communication. In the video group, parents received an interactive instructional DVD called "Being Responsive: You and Your Child with Autism." They independently completed video lessons and accompanying worksheets. Followup assessments were conducted 3 months after treatment finished. All outcomes were based on parent report. Children in the professionally led arm showed significantly greater improvement in social communication than children in the video-based arm, regardless of baseline scores. Parents in the professionally led group also reported reduced child-related stress relative to parents in the video group, with fathers reporting more stress than mothers in both groups. Parents in the professionally led group with low baseline self-efficacy reported higher followup self-efficacy levels than parents in the video arm.[100]

The second good quality prospective cohort study was conducted in Italy and reported in two papers.[101, 102] It compared staff- and parent-led ABA-based intervention (n=24, 92% male; mean age=55.67±17.63 months) to eclectic community-based therapy (n=20, 95% male; mean age=41.94±13.07 months). Group assignments were not random and were based upon parental preference. Children were excluded based on the presence of major medical issues. In the parent training group, children alternated between one week (average of 25 hours) of therapist-led center-based intervention (discrete trial training, incidental teaching, natural environment teaching) and 3 weeks (average of 14 hours/week) of parent-led home intervention. Treatment focused on individual skills, problem behaviors, and facilitated play and social interactions. In the eclectic group, children received in-home developmental and cognitive behavioral treatments (approximately 12 hours/week) with minimal parent involvement. Treatment goals were based upon staff expertise and preferences.

Compared with the eclectic group, children in the parent training arm showed a significant decrease in ASD symptom severity and increases in language production and mental development. The parents of children in the eclectic group reported that their children showed improved socialization and motor skills, but this was not confirmed by behavioral observation. In the parent training group, older children achieved better adaptive behavior outcomes; younger children made more gains in early language comprehension and production. Children who gained more language comprehension had higher adaptive behavior scores pre-treatment. Pre-treatment language comprehension predicted post-treatment language production. In the eclectic group, higher pre-treatment mental development state and early language skills predicted better outcome on parent-reported adaptive behaviors. Initial higher adaptive behaviors predicted better

post-treatment early language comprehension. In both groups, child outcomes on early language skills, mental developmental state, and adaptive behaviors were significantly influenced by self-reported parental stress, children's ability to respond correctly to prompts, the number and difficulty of treatment targets, and children's problem behaviors in sessions. Children who were perceived by their parents as more difficult had less improvement in ASD severity.[101, 102]

Two studies compared interventions focused on increasing parental responsivity. A good quality RCT from Europe (reported in two papers)[72, 105] compared treatment-as-usual + a manualized, communication-focused parent training (n=14, median age 48 months) to treatment-as-usual alone (n=14, median age=51 months) over 12 months. The intervention focused exclusively on parents and targeted increased parental response to child communication. The additional targeted treatment consisted of a recommended 30 minutes/day of parent-led intervention. Parents received monthly training for 6 months followed by training every 2 months for another 6 months. The intensity of treatment as usual alone was not reported but approaches consisted of speech pathology and ABA-based community treatments. The additional treatment group showed improvements in ASD symptoms, expressive language, and number of communicative acts during interactions with parents. Parents in the additional treatment group showed increased responsiveness to their children during videotaped interactions, which was correlated with reduced ASD symptom severity. No between-group differences were found in adaptive behavior or parenting stress. Greater language gains were seen in children who were younger with lower functioning levels at baseline.

A second fair quality RCT conducted in the United States also focused on enhancing parental responsivity and child communication.[93] It compared Hanen's More Than Words intervention to treatment-as-usual. The More Than Words group (n=29, mean age=21.11±2.71 months) received eight manualized group sessions with parents only and three in-home individualized parent-child sessions over a span of 3.5 months, whereas the control group (n=26, mean age=21.61±2.82 months) received no treatment or treatment as usual. There was no treatment effect on parental responsivity. The More Than Words group showed differential effects on child communication depending on children's baseline object interest; children with lower levels of baseline object interest had greater growth in communication skills, whereas children with higher levels of object interest showed attenuated growth.

A good quality RCT conducted in the United States compared the manualized Assessment Evaluation and Programming System for Infants (AEPS) with and without additional joint attention and social interaction opportunities.[103, 104] Both the AEPS group (n=24, mean age=28.6±2.6 months; mean intervention hours=205.66±18.63) and the control (n=24; mean age=28.8±2.8 months; mean intervention hours=196±21) received identical amounts of classroom-based treatment (10 hours/week), home-based parent training (1.5 hours/month), parent education (38 hours), and intervention methods. However, AEPS children received extra training in "interpersonal synchrony," targeting the three outcome variables of socially engaged imitation, initiation of joint attention, and shared positive affect. No significant ($p<.05$) differences emerged post-treatment on variables of interest. At the 6-month followup, the AEPS treatment group engaged in significantly more socially engaged interaction than controls ($p<.05$), with most of the growth in this skill occurring during the treatment period ($p<.05$) but not during followup ($p=.24$). No between-group differences were found for initiations of joint attention, shared positive affect, expressive language, or nonverbal problem solving. The AEPS group showed significant growth over time for all variables (p values<.01), but the control group only showed significant growth for expressive language ($p=.01$). Combined group analyses including

34 children from both the AEPS and control groups examined long-term outcomes an average of 37.6 months after the end of treatment (mean participant age=72.6±months). In this sample, cognitive skills and Vineland-II communication standard scores increased significantly from baseline (mean change 21.4±22.9, effect size=1.02, p<.001 and 12.7±19.4, effect size=0.81, p<.001, respectively), but there was no significant change in ASD symptom severity based on the ADOS.

A fair quality prospective cohort study[95] compared outcomes for four different types of intervention after 9 months of treatment: 1:1 home-based, manualized ABA (n=14, mean age=39±6.9 months); special education classroom enrollment (n=21, mean age=41.5±4.0 months); comparatively low-intensity, home-based, manualized behavioral intervention ("portage;" n=18, mean age 39.5±6.3 months), and 1:1 behavioral intervention ("local authority") that included an intensive introductory 5-day parent training component (n=13, mean age=40.2±6.3 months). The home-based ABA group received an average of 30.4 hours/week of intervention, 28.3 of which were 1:1. The special education group received an average of 12.7 hours/week (3.1 hours 1:1). The portage group received an average of 8.5 hours/week (6.5 1:1), and the local authority group received an average of 12.6 hours/week (12.2 1:1). Participants were not receiving any other teaching interventions during the study.

Post-treatment, mean cognitive and adaptive scores were not significantly different across groups. Children in the home-based ABA group showed significant improvements in educational outcomes as measured by the British Abilities Scale relative to other groups (p<.05). The authors created composite scores based on cognitive, adaptive, and educational functioning, but between-group comparisons only approached significance (p<.06). Baseline ASD severity and total intervention hours did modify effects of treatment significantly. First, baseline ASD severity was inversely related to composite change scores for all but the home-based ABA group and was positively related that group. That is, children with more severe ASD symptoms made more progress in ABA and less in the other intervention groups. Second, more intervention time was negatively related to composite change scores for children in ABA but not in the other groups. More hours of ABA were associated with less progress relative to school enrollment or other home-based interventions.[95]

One fair quality U.S. RCT (reported in two papers) compared parent-delivered ESDM to community-based treatment-as-usual.[98, 106] The ESDM group included 49 children (mean age 21.02±3.51 months, mean developmental quotient [DQ]=64.88±17.22); their parents completed 12 1-hour sessions that included manualized parent-training and coaching. Both the ESDM group and the community group (N=49; mean age=20.94±3.42 months, mean DQ=63.08±15.93) continued receiving community-based treatment-as-usual services as well, including the Developmental, Individual Difference, Relationship-based (DIR) model, TEACCH, ABA, and occupational and speech therapies (range of hours: 0-15.9), with the community group receiving significantly more intervention hours at the second time point (mean 3.68 vs. 1.48; p<.05). Compared with the ESDM group, children in the community-based arm had more severe social affect deficits, poorer imitation skills, and higher nonsocial orienting scores at baseline (p<.05). After treatment, both groups showed improvement in DQ and ADOS Social Affect scores with no main effects of group assignment. Both groups of parents showed significant increases in parent-child interaction behaviors, with greater increases in the ESDM group (effect size=.57) than the community-based group (.37).). Parents in the ESDM group reported significantly less parenting stress at followup (p=.04) but did not report more parenting competence. When examining combined groups, two key effects emerged. First, total intervention hours were

associated with reduced restrictive and repetitive behavior and nonsocial orienting and improved DQ and vocabulary comprehension. Second, children younger than 24 months showed greater increases in DQ scores (effect size=-1.20, p=.002).

A fair quality RCT from Canada compared a DIR-based model, MEHRIT (Milton and Ethel Harris Research Initiative Treatment Program), (n=25; mean age=42.52 months, SD=8.76) to community care-as-usual (n=26; mean age=46.38 months, SD=8.29).[107] Data were collected 12 months into an ongoing 24-month treatment course. MEHRIT was administered by trained occupational therapists and speech-language pathologists who worked with participants' parents for two hours per week. Community intervention included no more than 15 hours per week of ABA, speech and occupational therapy, social skills groups, and alternative treatments (mean intervention hours: 3.9 per week). Post-treatment, the MEHRIT group showed significantly more initiation of joint attention (p<.001), involvement in activities (p<.01), and attention to activities (p<.05). They also showed more enjoyment in interaction, but this group difference was also present at baseline (p<.05). Both groups showed significantly improved language skills adjusted for developmental quotients, with no significant between-groups effects (effect sizes of .451 for MEHRIT and .915 for community treatment).

Another fair quality RCT from Asia examined DIR/Floortime (n=15) compared with center-based ABA (n=16).[92] Groups were stratified based on age (24-47 months, 28-72 months) and ASD severity, based upon CARS scores. Both groups continued to receive treatment-as-usual, including enrollment in preschool programs and community-based services (such as speech or behavioral therapies.) Relative to the center-based group, the DIR/Floortime group showed significant improvement on the Functional Emotional Assessment Scale (p<.05) and ASD symptoms as rated by the CARS (2.9 vs. .08, p<.01). Parents in the DIR/Floortime group also rated their children as showing significant improvements in emotional development (p<.01). A fourth fair quality RCT comparing parent training plus special education preschool to special education preschool alone reported no between-group differences on language development after 12 months of intervention, though language skills within both groups improved over time.[94]

Three poor quality studies, two European prospective cohort studies [97, 108] and a crossover RCT from China,[99] compared parent training to lower intensity supportive interventions. Mean ages ranged from 25.33-33.6 months. Both involved home visits and working with children and parents. A lower intensity treatment model, Autism-1-2-3, compared two groups that received the same series of 10 half-hour child- and parent-training sessions, with one group having a lagged start date and serving as a control. It did not yield group differences on ASD symptoms, language skills, or parent stress scores.[99] Another lower intensity model, the Barnet Early Autism Model (BEAM), incorporated aspects of ABA, TEACCH, PECS, and other occupational and speech-language interventions. It provided an average of 6.4 hours of home-based intervention per week over ten months. Participants were compared with a care-as-usual group and were not randomly assigned. Relative to the control group, BEAM recipients improved significantly more in adaptive behavior (p<.001) and receptive language (p<.05) but not IQ, with baseline levels of parenting stress negatively related to language and adaptive outcomes. [108] The Keyhole model incorporated elements of Hanen's More Than Words and the TEACCH programs. It compared 15 to 18 home visits over a 9 month period (n=35) targeting adaptive skills, ASD symptoms, and parent stress to a lower-intensity intervention model (n=26; 5 home visits, no additional services or supports). Compared with the lower-intensity group, children in the Keyhole intervention showed improved adaptive, imitation, and communication skills, based upon parent report. Mothers in in the Keyhole group also reported improved health but not stress.[97]

Table 7. Key outcomes of early intervention studies with parent training components

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	Key Outcomes
Schreibman et al. 2013[109] US **G1:** Pivotal Response Training, 20/20 **G2:** PECS, 19/19 Quality: Good	**G1:** 29.5±6.9 **G2:** 28.9±4.2 NR	• Children in both G1 and G2 showed gains in language from baseline to followup 3 months after the end of treatment but no between group differences reported; effect sizes for change ranged from .001 to .486 • In the PECS group 12/19 children mastered requesting and were learning to comment using pictures • Mean number of spoken words gained across groups=80; individual progress varied widely , with 78% of children using at least 10 spoken words at final followup
Landa et al. 2012[103, 104] US **G1:** Assessment Evaluation and Programming System for Infants and Children (AEPS) curriculum+ additional joint attention and social interaction opportunities, 25/24 **G2:** AEPS curriculum, 25/24 Quality: Good	**G1:** 28.6±2.6 **G2:** 28.8±2.8 G1+G2: **60.1±11.9**	• Greater socially engaged imitation in G1 compared with G2 at end of intervention and at 6-month followup (effect size=0.86, p.01); growth occurred during intervention period vs. followup period • Initiations of joint attention did not differ significantly between groups at the 6-month followup, though each group improved over time • Measures of expressive language and nonverbal cognition did not differ between groups at the 6-month followup • At long-term followup of G1+G2 (n=34) at mean 37.6 months after end of intervention (mean age=72.6±17.5 months), IQ and Vineland communication scores increased from baseline (mean change 21.4±22.9, effect size=1.02, p<.001 and 12.7±19.4, effect size=0.81, p<.001, respectively) • No change in symptom severity (ADOS) at the long-term followup

Table 7. Key outcomes of early intervention studies with parent training components (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	Key Outcomes
Strauss et al, 2012[101, 102] Italy **G1**: Staff & parent mediated early intervention, 24/24 **G2**: Eclectic, 20/20 Quality: Good	**G1**: 55.67±17.63 **G2**: 41.94±13.07 **G1**: 55.65±20.06 **G2**: 74.29±29.37	• Compared with G2, children in G1 showed significant decrease in ASD symptom severity, increases in language production and mental development • Compared with G1, children in G2 had improved parent-reported socialization and motor skills • In G1, older children achieved better adaptive behavior outcomes; younger children made more gains in early language comprehension and production. Children who gained more language comprehension had higher adaptive behavior scores pre-treatment. Pre-treatment language comprehension predicted post-treatment language production • In G2, higher pre-treatment mental development state and early language skills predicted better outcome on adaptive behaviors. Initial higher adaptive behaviors predicted better post-treatment early language comprehension • In both groups, child outcomes on early language skills, mental developmental state and adaptive behaviors were significantly influenced by parental stress, child ability to respond correctly to prompts, number and difficulty of treatment targets, and child problem behaviors in sessions. The predictive power of parental stress on outcome ASD severity was modified by perception of difficult child, with higher perceptions of difficulty associated with lower decreases in ASD severity
Aldred et al. 2011[72, 105] UK **G1:** Parent training in social communication intervention plus community intervention, 14/14 **G2:** Community intervention, 14/14 Quality: Good	**G1:** 51.4±11.8 **G2:** 50.9±16.3 NR	• G1 showed improvements in ADOS scores, social interaction, expressive language, child communication acts during interaction; no adaptive behavior differences or differences in parenting stress between groups • Language gains particularly prominent in younger, lower functioning children. • Increased parental synchrony (communication which maintained vs. redirected or controlled child responses) in G1 associated with reduction in child ADOS score (decreased impairment, p=.014); reduction in synchrony for G2 and small increase in mean ADOS scores. In tests of mediation, change in parental synchrony accounted for 34% of total treatment effect on ADOS outcome
Roberts et al. 2011[96] Australia **G1**: Individualized home-based program, 34/27 **G2**: Small group center-based program combined with parent training and support group, 33/29 G3: Waitlist, 28/28 Quality: Good	**G1**: 41.5 **G2**: 43.1 **G3:** 43.7 **G1**: 57±11.7 **G2**: 66±17.7 **G3:** 63.3±15.5	• Significant greater improvement in Reynell comprehension standard score for G2 compared with G1 (-7.3; 95% CI (-13.9, - 0.7), p=0.02); greater improvement for expression standard score of the Reynell for the G2 compared with G1 (-3.0; 95% CI (-9.0, 2.9), P=0.31) • Reynell standard comprehension and expression scores G3 performed better than G1, but not significantly • For the Reynell standard comprehension and expression scores G2 performed better than G3 but not significantly. • G3 improved significantly more than the G1 for the social scale of the Vineland • No statistically significant differences among the three groups for other child outcomes. When analyses were limited only to children with autism spectrum diagnoses, the magnitude of the effects increased but the presence or absence of statistical significance did not. • Parent outcomes: Parenting: statistically significant differences favoring G2 vs. G1 • No significant difference between groups for stress

Table 7. Key outcomes of early intervention studies with parent training components (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	Key Outcomes
Keen et al. 2010[100] Australia **G1:** Professional parent intervention, 17 families/NR **G2:** Self-directed video based parent intervention, 22 families/NR Quality: Good	**G1:** 36.38±7.54 **G2:** 35.71±6.92 **G1:** 53.06±9.06 **G2:** 52.86±6.53	• G1 showed significantly greater improvement on social communication at followup than G2 regardless of values at baseline • Parents low in self-efficacy at baseline demonstrated relatively higher levels of self-efficacy if they received G1 vs. G2 • G1 reduced child-related stress relative to G2 for both mothers and fathers • Fathers reported higher levels of stress than mothers in both groups. • Behavior sample scores at followup not affected by group condition • All outcomes are based on parent report.
Casenhiser et al. 2013[107] Canada **G1:** MEHRIT (developmental individualized relationship-based intervention), 25/25 **G2:** Community-based treatment, 26/26 Quality: Fair	**G1:** 42.5±8.8 **G2:** 46.4±8.3 NR	• At pretreatment, G2 had higher scores on investigator-rated "enjoyment in interaction" domain of the modified Child Behavior Rating Scale; at followup, G1 improved significantly more compared with G2 on the domains of attention to activity, involvement, initiation of joint attention, and enjoyment in interaction (p values <.05, effect sizes 0.63-1.02); no significant difference in compliance domain • Both groups improved from baseline to followup on language developmental quotient measure but no significant between group difference • Greater baseline language skills, initiation of joint attention, and involvement were significant predictors of language change

Table 7. Key outcomes of early intervention studies with parent training components (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	Key Outcomes
Rogers et al. 2012[98, 106] US **G1**: Parent-delivered Early Start Denver model (ESDM), 49/49 **G2**: Community treatment as usual, 49/49 Quality: Fair	**G1:** 21.02±3.51 **G2:** 20.94±3.42 **G1:** 64.88±17.22 **G2:** 63.08±15.93	• At followup, G1 received mean 1.48 hours treatment/week G2 received 3.68 (p<.05) • G2 had more severe social affect symptoms at baseline, poorer imitation and nonsocial orienting scores compared with G1 (p<.05) • No significant group differences on ADOS scores or measures of development at followup • Parent stress significantly lower in G1 vs. G2 (p=.04); numbers of intervention hours did not affect parent stress or sense of competence • Measures of parent acquisition of parent-child interaction skills did not differ between groups at followup • Social orienting and imitation skills were not found to be moderators of outcomes; increased hours of intervention and younger child age were significantly associated with improved developmental and vocabulary scores in a pooled analysis (p≤.05). In analyses by group, age and hours of intervention associated with improvements in vocabulary for G1 (p≤.05)
Reed et al. 2012[95] UK **G1:** ABA, 14 **G2:** Special nursery, 21 **G3:** Portage, 18 **G4:** Local authority-developed parent training, 13 Quality: Fair	**G1:** 39.0±6.9 **G2:** 41.5±4.0 **G3:** 39.5±6.3 **G4:** 40.2±6.3 **G1:** 55.1±17.3 **G2:** 52.2±17.1 **G3:** 54.0±15.4 **G4:** 51.7±14.5	• Scores on cognitive and adaptive measures were not significantly different among groups • Scores on British Abilities Scale improved for G1 vs. G2-G4 (p<.05) • Composite change scores (mean of change scores on cognitive, adaptive, and educational measures) were not statistically significantly different across groups, although G1 vs. G2-4 and G2 vs. G3-4 approached significance (p<.06) • Composite change scores were inversely related to initial ASD severity for G2-G4 but positively related for G1; the strength of that relationship only differed significantly between G1 and G3 (p<.05) • As time in intervention increased, composite scores improved for G2-G4 but worsened for G1 (p<.05). No differences were found in the amount of improvement between G2-4
Pajareya et al. 2011[92] Thailand **G1:** DIR/Floortime,16/15 **G2:** Usual care, 16/16 Quality: Fair	**G1:** 56.6±10.1 **G2:** 51.5±13.9 NR	• G1 improved significantly on the Functional Emotional Assessment Scale compared with G2 (p=.045) • CARS scores decreased (improved) for G1 vs. G2 (mean change 2.9 vs. 0.8, p=.004) • G1 scores on parent-rated measure of emotional development significantly improved compared with G2 (mean change 7.7 vs. 0.8, p=.007)
Carter et al. 2011[93] US **G1**: More than Words, 32/29 **G2**: Control, 30/26 Quality: Fair	**G1:** 21.11±2.71 **G2**: 21.51±2.82 NR	• No treatment effect on parental responsivity • G1 showed differential effects on child communication depending on a baseline child factor • Children with lower levels of baseline object interest exhibited facilitated growth in communication • Children with higher levels of object interest exhibited growth attenuation

Table 7. Key outcomes of early intervention studies with parent training components (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	Key Outcomes
Oosterling et al. 2010[94] **G1:** Nonintensive parent training+specialized preschool, 40/36 **G2:** Specialized preschool, 35/31 Quality: Fair	**G1:** 35.2±5.5 **G2:** 33.3±6.4 **G1:** 58.4±16.8 **G2:** 58.0±16.9	• No between group differences on language development after 12 months of intervention, though language skills within groups improved over time • No differences in CGI-Improvement scores (G1: 57% much improved, G2: 52% much improved) • No significant effects on parenting skills in either group; engagement, early social communication precursors, parental skills not found to be mediators of effects. DQ not a significant moderator
Reed et al. 2011[108] UK **G1:** Barnet Early Autism Model (BEAM), 16/16 **G2:** Portage Treatment, 16/16 Quality: Poor	**G1:** 43.6±5.8 **G2:** 40.1±8.3 **G1:** 83.3±23.7 **G2:** 72.3±12.5	• Significant gains from baseline to followup for G1 vs. G2 in investigator-and parent-rated measures of adaptive behavior and language (p values<.05) • Greater reduction in parental stress and increase in satisfaction in G1 vs. G2 (p values <.01) • Lower parent stress at baseline correlated with gains in adaptive behavior and language (p values <.05)
Wong et al., 2010[99] China **G1**: Early intervention, 9/9 **G2**: Control, 8/8 Quality: Poor	**G1**: 25.33±6 **G2**: 27.88±5.57 **G1**: 17.85±4.16 **G2**: 17.91±4.49	• No significant group difference on communication, reciprocal social interaction or symbolic play • No between group differences on parent observation on language and relationship to people • No group difference on total parent stress scores
McConkey et al., 2010[97] UK **G1**: Keyhole early intervention program m, 36/35 **G2**: Control, 26/26 Quality: Poor	**G1**: 2.8 years **G2**: 3.4 years NR	• G1 showed significant improvements on different indices of communication than G2 • Mothers improved on measures of health G1 more than G2 but not of stress • Higher percentage of parents in G2 reported the children were improving on language and imitation at Time 1 compared with G1 percentages comparable at Time 2 • Only parents in G1 reported significant improvements from Time 1 to Time 2 on language, imitation and relating to others

ADOS = Autism Diagnostic Interview Schedule; CI = confidence interval; CGI = Clinical Global Impression; DQ = developmental quotient; EEG = electroencephalography; ESDM = Early Start Denver Model; G = group; IQ = intelligence quotient; N = number; NR = not reported; PDD-NOS = Pervasive Developmental Disorder-Not Otherwise Specified; PECS = Picture Exchange Communication System; SD = standard deviation

Social Skills Interventions

Key Points

- Thirteen behavioral studies examined different social skill interventions and included children and adolescents with ASD. Overall, the quality of the studies improved in comparison to the 2011 review. Two studies were rated as good quality, while 10 studies were fair quality, and one was poor.
- Most studies included school-aged children, without concomitant intellectual disability or language deficits. Most children had average cognitive skills (IQ>70).
- Most studies reported short-term gains in social skills and emotion recognition as reported by parents or within study measures. Maintenance and generalization of skills beyond the treatment context was addressed within the majority of the studies, but with variable results.
- The diversity of the intervention protocols and assessments utilized to measure outcomes continues to be a limiting factor for determining effectiveness of social skills interventions.

Overview of the Literature

In addition to the nine comparative studies assessing social skills included in the 2011 review, eight RCTs of fair[114-116] and poor[117-121] quality and one poor quality retrospective cohort[122]), 13 studies of good,[123, 124] fair,[117, 125-134]and poor[135] quality addressed interventions targeting social skills. Followup data for one study reported in the original review is included in this update.[117, 134] Studies addressed in the current review included a total of roughly 462 participants (mean/study=36). Seven RCTs were conducted in the United States,[117, 124-127, 129, 134, 136] one in Europe,[137] one in Japan,[135] and two in Australia.[123, 132] Two nonrandomized studies were also conducted in Australia.[131, 133] Participant ages across studies ranged from 4 to 13 years, and participants typically had high functioning ASD (IQ>70). Studies assessed group-based approaches including replications of studies evaluating the Skillstreaming model;[126, 127, 129, 136] the Children's Friendship Training model; [117, 134] a Japanese pilot RCT of the Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH) model;[135] incorporated peer-mediated components;[124, 125, 138] and targeted emotion recognition in children with ASD.[123, 128, 132, 133]

Detailed Analysis

Four fair quality RCTs conducted in the United States addressed group-based social skills approaches.[126, 127, 129, 136] Among these, three studies evaluated the manualized Skillstreaming model (Table 8).[127, 129, 136] The studies included between 13 and 52 total participants, all of whom were considered to be high-functioning, and most of whom were male. One RCT compared a manualized performance-based approach, Sociodramatic Affective Relational Intervention, versus the knowledge-based Skillstreaming social skills intervention, which emphasizes social skills, face-emotion recognition, interest expansion, and interpretation of non-literal language. The study included 13 boys with ASD between the ages of 9 and 12. Weekly 90-minute sessions treatment sessions were held over 4 weeks after school. Treatment sessions, regardless of the intervention, included content covering considering others, emotions, consolidating, and generalization of skills. Participants in both groups increased in reciprocal friendship nominations (p=.027) and staff-reported social skills (effect size=0.59, p=.002). Participants in the sociodramatic group interacted more with each and rated one another more favorably after one session, which slightly decreased over time (effect size=0.70, p=.001). Skillstreaming

participants also demonstrated gains in interactions and more favorable ratings over the course of the intervention, but at a slower rate as compared with the sociodramatic group (effect size=0.37, p=.001). No significant differences in parent report of social functioning were demonstrated for either group.[129]

A second RCT[127] examined the short-term outcome of a 5-week trial of the Skillstreaming approach and replicates the intervention reported in a study[115] described in our 2011 review. The study included 36 children (mean age=9.47), primarily male (94% of the total sample) with high functioning ASD (mean IQ=103) randomized either to Skillstreaming or a wait-list control group. Participants in the treatment group showed significant improvements in most parent-rated measures of social skills compared with the control group (Social Responsiveness Scale: effect size=0.625, p=.003; Adapted Skillstreaming Checklist: effect size=0.584, p=.006; Behavioral Assessment System for Children (BASC)-Withdrawal scale: effect size=1.055, p<.001); however, group differences on the BASC-Social Skills scale were not significant. Staff-report measures found similar outcomes, with significant improvements in ASD symptomology and program-targeted social skills, as well as a decrease in withdrawn behaviors in the treatment group compared with the control arm (effect sizes ranging from 0.69 to 1.4, p values ≤.007). Child-rated measures similarly improved in the Skillstreaming group compared with control (Skillstreaming Knowledge Assessment: effect size=1.272, p<.001; understanding of idioms: effect size=0.390, p<.001).[127]

Another RCT replicating the Skillstreaming model reported by Lopata et al.[127] included 35 children with high functioning ASD between the ages of 7 and 12.[136] Skillstreaming involved five 70-minute sessions treatment sessions per weekday over 5 weeks. Treatment sessions involved skill instruction (nonliteral language and face-emotion recognition) and practice as well as a behavioral system to encourage participation and decrease problem behaviors. Weekly 90-minute parent trainings were also conducted, which involved education on ASD as well as training on the treatment program. Scores on the parent-rated Skillstreaming Checklist, Social Responsiveness Scale, and Behavior Assessment System for Children-2 Withdrawal scales improved for the Skillstreaming group compared with the control (effect sizes 0.85, 0.67, 0.70 respectively, all p<.01). Child-rated measures also improved for the treatment group compared with control (Skillstreaming Knowledge Assessment effect size 1.15; language assessment=0.34, p<.001). No group differences were found in face-emotion recognition. Maintenance of effects on the Skillstreaming Knowledge Assessment and BASC Social Skills scale for the treatment group was demonstrated 2 to 3 months post-treatment (effect sizes 0.47 to 0.68).[136]

Another RCT examined the short-term outcome of a trial of a manualized outpatient 15-week social skills program, the Social Skills Group Intervention – High Functioning Autism (SS GRIN-HFA).[126] The study included 55 children, primarily male (98% of the total sample) with IQ>85 randomized either to SS GRIN-HFA group (mean age 10.2 years) or to a traditional SS GRIN group (mean age 9.9). Participants in the SS GRIN-HFA group showed significant improvement in social skills, with significantly better scores than the control arm on all Social Responsiveness Scale domains except social cognition (effects sizes ranging from -0.67 to -0.94). In addition, parents of children in the treatment group reported significant improvement in the areas of their child's social awareness, motivation for social interaction, social communication skills, and unusual mannerisms associated with ASD. No significant difference was found between the treatment group and control group regarding child self-report of self-efficacy or loneliness.

A final RCT examined followup of the Children's Friendship Training (CFT) manualized program.[117, 134] In the initial report included in the 2011 review, [117] 76 children with ASD enrolled in second to fifth grades were randomly assigned to the treatment group (n= 40) or the delayed treatment group (n=36). Weekly 60-minute treatment sessions were held over 12-weeks, with parent and child training occurring concurrently in separate locations. Skills targeted as part of the treatment included conversational skills, peer entry skills, developing friendship networks, good sportsmanship, host behavior during play dates, and handling teasing.
Participants in the treatment group demonstrated modest gains in the number of hosted play dates ($p<.001$) as well as a decrease in electronics-use during play dates ($p<.001$). Participants in the treatment group also demonstrated less disengaged behavior ($p <. 001$), internalizing behavior ($p<.001$), and less conflict during play dates ($p =.069$). In a followup analysis,[134] 24 participants from the initial study were followed to examine maintenance of skills. At long-term follow-up 1 to 5 years post-participation in the training, participants continued to demonstrate increased social opportunities through invited play dates, maintenance of friendships, and decreases in loneliness from baseline ($p<.05$). Participants also demonstrated maintenance of gains in overall social skills along with reduction of problem behaviors ($p<.05$).

One Japanese pilot RCT[135] examined the Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH)-based manualized group social skills training. The study included 11 children (mean age=64 months) with High Functioning Autism (HFA) (IQ >75) and their mothers, who were randomly assigned to the TEACCH program (n=5) or a wait-list control group (n=6). The treatment group consisted of weekly 2-hour sessions, with 20 sessions over 6 months. The control group consisted of group meetings with the mothers on a bi-monthly basis, consisting of 30-60 minute meetings with two social workers. Participants in the treatment group showed moderate improvement in adaptive behaviors and social reciprocity of the children, parenting stress, and parent–child interactions compared with the control group.

Two RCTs[124, 125] and one nonrandomized controlled trial[138] assessed interventions targeting social skills and incorporating typically developing peers or siblings. Studies included 21 to 60 participants, generally with high functioning ASD. One RCT examined short-term outcomes of a trial of an outpatient peer tutor social skills training program.[124] The study included 44 children (mean age=9 years, IQ>70) who met criteria for a pervasive developmental disorder. Sixteen out of 23 participants in the treatment group were considered treatment responders as rated by their parents, compared with 0/18 in the control arm ($p\leq.001$). Children with Asperger syndrome were more likely to be responders compared with children with PDD-NOS ($p=.03$); IQ was not associated with response status. No significant differences were found between the treatment group and wait list group on social competence measures.

A second fair quality RCT evaluated child-directed social skills training (CHILD) compared with peer-mediated social skills training (PEER) applied to children with high-functioning autism attending regular education classrooms.[125] The study included 60 children (mean age=8.14, mean IQ=90.7) randomized to one of four treatment groups (n=15/group): 1) CHILD group 2) PEER group 3) CHILD+PEER and 4) a control group. Treatment occurred over 6 weeks. In the CHILD condition, it included 1:1 training and practice in social skills targeting deficits identified for each child. In the PEER arm, it included peer interaction focused on positive social modeling. Participants who received PEER interventions (PEER alone or PEER+CHILD) showed significant improvements in social network salience (prominence of a child within the classroom social network) compared with the other groups ($p\leq.006$). At the final followup 12 weeks after the end of the intervention, salience remained higher for the

CHILD+PEER arm compared with CHILD alone and the control group but not compared with PEER alone. Teacher ratings of social skills also improved from baseline to final followup for the peer-mediated group as did measures of solitary engagement and joint attention.

One fair quality, non-randomized trial examined the effectiveness of including siblings in social skills training groups for boys with Asperger's Syndrome.[131] The study included 21 children with Asperger syndrome between the ages of 8 and 12. Investigators partially randomized participants to one of three treatment groups (first 15 randomly assigned to one of three groups; later recruits assigned based on whether they had an older sibling; if no sibling, participants were randomly assigned to "no sibling" training or wait-list control group). Eight weekly 2-hour sessions treatment sessions were held in a clinical setting. Treatment sessions included content covering nonverbal social cues, such as eye contact, body language, tone of voice, and facial expression. Techniques included extended time, repeated practice, conceptual explanations, role play, and use of social dilemmas. Participants were also assigned a different partner each week to encourage social interaction and cooperation. Sibling participants were not given any specific training or instruction other than what was provided as part of the treatment sessions. Homework tasks were given to facilitate generalization. Participants in the active treatment groups demonstrated significant improvement in identification of nonverbal cues to identify emotions compared with the waitlist control group (effect size=0.47, $p<.001$). While the ability to identify social cues was maintained by the participants in the active treatment groups, no increase in skills was demonstrated at 3-months post-intervention. Parents in all groups rated socials skills for both children with ASD and siblings as improved over time (effect size=0.55, $p<.001$). No difference in teacher report of social skills for target participants or siblings was demonstrated.

Three RCTs, one of good and two of fair quality, addressed interventions targeting emotion recognition in children with ASD.[123, 128, 132] Two studies used specialized DVDs to demonstrate emotions and one used a manualized, group-based intervention focused on Theory of Mind training, which includes recognizing emotions, understanding differences between fantasy and reality, perspective taking, and reasoning about other people's mental states. Two RCTs conducted in Australia (one good quality[123] and one fair[132]) assessed the outcome of The Transporters DVD series as an intervention for emotion recognition. The first RCT examined changes in emotion recognition and generalization of newly acquired skills to improvements in social perception skills over a 3-month period. The study included 55 children with ASD between the ages of 4 and 7 randomly assigned to view either the Transporters DVD series or the control DVD series (Thomas the Tank Engine) for four weeks (15 minutes per day in their home setting). Parents were also provided with a diary to record the number of hours watched per day. Compared with control participants, participants in the treatment group improved in emotion identification and matching of emotions (anger only) immediately following the intervention, with improvements maintained 3-months post-intervention. Gains were also seen in the treatment group 3-months post-intervention for identification of happiness and emotion recognition within situations. In both groups, no difference was found in affect recognition, theory of mind, or social skills immediately following the intervention or at the maintenance phase. Long-term improvements in identification of happiness expressions were associated with greater ADOS severity, as was matching of emotions overall and of sadness specifically. Age was correlated with identification of fear expressions, affect recognition, and the mind reading desire-based task. Verbal IQ was also associated with some short term improvements.[123]

A second, 3-week RCT comparing The Transporters DVD with the control series included 25 children with PDD between the ages of 4 and 8. Parents were also provided with a user guide to facilitate their child's participation in watching the episodes as well as logbook to record the number of sessions watched per day. Participants in the treatment group improved on standardized measures of emotion and facial recognition (effect sizes range 0.48-0.92, $p<.001$), while both groups improved on social peer interest (effect size=0.24, $p=.01$) and eye contact (effect size=0.44, $p<.001$). In both groups, no difference was found in gaze aversion or stereotyped behavior. This study provided little information on the demographics of the participants. This study also did not provide information on the user guide, which may be a confounding variable to the obtained findings. The authors also refer to Nonverbal IQ in one of their tables, but only administered the Block Design subtest, which does not fully measure all aspects of nonverbal IQ.[132]

A fair-quality study examined the short-term outcome of a trial of a manualized Theory of Mind training program.[128] The study included 40 children (mean age=10 years) with a diagnosis of high functioning ASD and cognitive abilities within the average range (mean IQ=100.1 in the treatment group and 103.3 in the control group). The participants were randomized either to a 16-week Theory of Mind training group or a wait list control group. Participants in the treatment group improved on their conceptual theory of mind skills compared with the control group (awareness of multiple emotions, effect size=0.84, $p<.05$; complex emotions, effect size=1.19, $p<.01$), but no significant differences were found between groups on elementary theory of mind understanding, self-reported emphatic skills, or parent-reported social behavior.

An additional study examined the short-term outcome of a trial of a pictorial system called thought bubble training on Theory of Mind tasks, including difficulty with false belief tests.[133] The study included 24 children (mean age=7 years) with a diagnosis of ASD. The participants were not randomized into the thought bubble intervention group (n=17) or control group (n=7) based on standardized means, but rather on preference by school staff. The two groups were comparable in terms of chronological age, verbal intelligence, semantic language skill, syntactic language ability, and nonverbal intelligence. In addition, a within-group rather than between-group statistical analysis was utilized. Within-group analyses indicated that the children in the thought bubble intervention group showed significantly higher post-training test scores on all Theory of Mind variables. These post-test gains were also maintained at three-week followup. In contrast, the children in the control group did not show any significant improvements in their pre- and post-test scores on Theory of Mind variables, nor did they show any improvements at followup. Seven children in the thought bubble intervention group and one child in the control group were not available at followup.

Table 8. Summary of outcomes of social skills studies

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Years±SD IQ, Mean±SD	Key Outcomes
Group-based Social Skills Approaches		
Lerner et al. 2012[129] US **G1:** Sociodramatic Affective Relational Intervention (SDARI), 7/7 **G2:** Skillstreaming, 6/6 Quality: Fair	**G1:** 10.86±1.68 **G2:** 11.33±1.63 NR	• Study included only boys with high functioning ASD, 69% diagnosed with Asperger syndrome • Compared with G2, G1 participants decreased in both positive and negative interactions over time (effect size=-1.17) • G2 participants increased in social preference (effect size=0.37); both groups increased in number of reciprocated friendship nominations (effect size=0.31, p=.048) and in interventionist-rated social skills (effect size=0.59, p=.002) • No significant effects on parent-rated measures
Thomeer et al. 2012[136] US **G1:** Skillstreaming, 17/17 **G2:** Wait list control, 18/18 Quality: Fair	**G1:** 9.24±1.64 **G2:** 9.39±1.91 **G1:** 104.26±14.13 **G2:** 103.42±13.26	• Study replicates Lopata 2010[127] and included children with high functioning ASD (71% Asperger syndrome, mean IQ G1+G2=103.83±13.49) • G1 scores on parent-rated Skillstreaming Checklist, Social Responsiveness Scale, and Behavior Assessment System for Children-2 Withdrawal scales improved compared with G2 (effect sizes 0.85, 0.67, 0.70 respectively, all p<.01) • G1 scores on child-rated Skillstreaming Knowledge Assessment and language measure improved compared with G2 (effect sizes 1.15, 0.34 respectively, p<.001) • G1 improved from baseline to followup 2-3 months post-intervention on the Skillstreaming Checklist (effect size=0.47, p=.006) and Behavior Assessment System for Children Social Skills scale (effect size=0.68, p=.004)
Lopata et al. 2010[127] US **G1:** Skillstreaming, 18/18 **G2:** Wait list control, 18/18 Quality: Fair	**G1:** 9.39±1.72 **G2:** 9.56±1.54 **G1:** 101.63±13.75 **G2:** 104.45±15.46	• Study replicates intervention reported in earlier studies (Lopata 2006, 2008[115]) and included children with high functioning ASD, 78% with Asperger syndrome, 94% male • Most scores on parent-rated measures were improved for G1 vs. G2 (Social Responsiveness Scale effect size=0.625, p=.003; Adapted Skillstreaming Checklist effect size=0.584, p=.006; Behavioral Assessment System for Children (BASC)-Withdrawal effect size=1.055, p<.001). Differences on the BASC-Social Skills measure were not significant • Staff-rated measures were significantly improved for G1 vs. G2 (Social Responsiveness Scale effect size=0.711; BASC Withdrawal and Social Skills effect sizes ranging from 0.69 to 0.78, p≤.007; Adapted Skillstreaming Checklist effect size=1.421, p<.001 • Most child measures improved significantly for G1 vs. G2 (Skillstreaming Knowledge Assessment effect size=1.272, p<.001; understanding of idioms effect size=0.390, p<.001). Child Faces scores were not significantly different
DeRosier et al. 2010[126] US **G1:** Social Skills Group Intervention-High Functioning Autism (S.S.GRIN-HFA), 27/24 **G2:** Traditional S.S.GRIN, 28/28 Quality: Fair	**G1:** 10.2±1.3 **G2:** 9.9±1.1 NR	• Study included participants with high functioning ASD, 98% male • G1 improved significantly compared with G2 on all Social Responsiveness Scale domains except cognition (p≤.05, effect sizes ranged from -0.67 to -0.94) and on the Achieved Learning Questionnaire (effect size=0.75, p<.05) • Child reported measures of self-efficacy and loneliness did not differ by group

Table 8. Summary of outcomes of social skills studies (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Years±SD IQ, Mean±SD	Key Outcomes
Group-based Social Skills Approaches		
Mandelberg et al., 2013 [117, 134] US **G1:** Children's Friendship Training, 35/24 (at mean 43 month followup) G2: Control, 33/31 (at 12 week followup) Quality: Fair	At 43 month Followup **G1:** 12.6 **G1:** 104.1±17.8	• After 12 weeks treatment, parents of G1 reported that their children hosted significantly more play dates after treatment relative to G2 (p<0.0001), but were not invited to significantly more play dates • Parents reported that G1 spent less time engaged in minimally socially interactive activities during play dates compared with G2 (p<0.001), but did not spend significantly more time in socially interactive activities (such as talking) • Parents of G1 reported increased self-control in children (p<0.05) when provoked by others. No changes reported by teachers • G1 showed significant decreases in loneliness (p<0.025) and increases in popularity (p<0.025) following treatment relative to G2 • At long-term followup of G1, children with ASD demonstrated increased social opportunities for invited play dates and maintained at least one close friendship • Child report of loneliness also decreased in the long-term followup • Overall ratings of social skills continue to demonstrate gains along with reduction of problems behaviors over time
Ichikawa et al. 2013 [135] Japan **G1:** TEACCH, 5/5 **G2:** Wait list control, 6/6 Quality: Poor	**G1:** 64 months **G2:** 62 months DQ (Kyoto Scale of Psychological Development): **G1:** 87 **G2:** 88	• Pilot study of Japanese participants with high functioning ASD and their mothers • G1 showed moderate improvement with regard to the children's adaptive behaviors, social reciprocity, parenting stress, and parent–child interactions
Peer Approaches		
Koenig et al. 2010[124] US **G1:** Peer tutor social skills training, 25/23 **G2:** Wait list control, 19/18 Quality: Good	**G1:** 9.2±1.2 **G2:** 9.3±1.2 **G1:** 96.4±20.5 **G2:** 95.9±17.3	• Study included high functioning children with ASD (IQ≥70) • 16/23 G1 participants and 0/18 G2 were considered treatment responders (much improved or very much improved on CGI-I), p=.001 • Children with Asperger syndrome more likely to be responders vs. children with PDD-NOS, p=.03; no differences between those with autism and Asperger syndrome or PDD-NOS • IQ not associated with response status • No significant differences at followup within groups or between groups on social competence measures

Table 8. Summary of outcomes of social skills studies (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Years±SD IQ, Mean±SD	Key Outcomes
Peer Approaches		
Kasari et al. 2012[125] US **G1:** Individualized child-directed social skills training (CHILD), 15/14 **G2:** Peer-mediated social skills training (PEER), 15/15 **G3:** CHILD+PEER, 15/15 **G4:** Control, 15/15 Quality: Fair	**G1:** 8.23±1.48 **G2:** 7.60±1.35 **G3:** 8.67±1.68 **G4:** 8.07±1.69 **G1:** 93.93±19.60 **G2:** 84.80±10.12 **G3:** 90.33±14.17 **G4:** 95.07±19.44	• Study included high functioning children with ASD attending regular education classrooms for ≥80% of day, overall mean IQ=90.97±16.33; significantly more females in G2 compared with other groups, p=.004 • Social network salience increased for G2 and G3 compared with other groups, effect sizes for G2 ranged from 1.12 to 1.18 vs. G1 and G4 (p≤.006) at end of intervention; at followup 12 weeks post-intervention, salience significantly higher for G3 compared with G1 and G4 but not G2 • Solitary engagement on playground and joint attention improved at final followup for G2 • Teacher ratings of social skills improved from baseline for G2 (p=.01) but not G1, G3, or G4. No significant differences for any group at final followup
Castorina et al. 2011[131] Australia **G1:** Social skills training with sibling, 7/7 **G2:** Social skills training without sibling, 8/8 **G3:** Wait list control, 6/6 Quality: Fair	**G1+G2+G3:** 10.30±1.15 NR	• Study included only boys with Asperger syndrome • In post-hoc comparisons, both G1and G2 had significantly higher Child and Adolescent Social Perception measure scores than G3 at followup (p≤.003); differences between G1 and G2 were not significant • Ability to read social cues improved in G1 and G2 from baseline to end of intervention • No significant difference between groups on parent or teacher rated social skills measures (Social Skills Rating System)
Emotion Recognition Approaches		
Williams et al. 2012[123] Australia **G1:** Emotion recognition training (Transporters DVD), 29/21 **G2:** Control (Thomas the Tank Engine DVD), 31/25 Quality: Good	**G1:** 62.83 months±11.17 **G2:** 61.93 months±9.91 **G1:** 77.93±13.96 **G2:** 74.56±13.58	• G1 improved in identification of expressions of anger (p=.01), overall emotion identification (p=.00) and identification of anger (p=.03) compared with G2 from baseline to end of intervention; Vineland socialization, theory of mind task scores, and affect recognition scores did not differ significantly between groups • Compared with G2, G1 improved on identification of happy facial expressions (p=.02) and mindreading situational task scores 3-months post-intervention; scores on identifying expressions of anger and on the theory of mind contextual task decreased for G1 vs. G2 (p≤ .02) • Long term improvements in identification of happiness expressions associated with greater ADOS severity. Age was correlated with identification of fear expressions, affect recognition. Verbal IQ was associated with some short term improvements
Young et al. 2011[132] Australia **G1:** Emotion recognition training (Transporters DVD), 13/13 **G2:** Control (Thomas the Tank Engine DVD), 12/12 Quality: Fair	**G1+G2 (range):** 4-8 years **G1:** 11.31 (4.17) **G2:** 8.67 (4.05)	• Videos provided to groups differed in level of emphasis on emotion recognition • Affect recognition improved significantly in G1 vs. G2 (effect size=0.53, p<.001) as did Faces task scores (effect size=0.31, p=.005) • Both groups improved significantly on measures of social peer interest and eye contact; between group differences were not significant • Improvements in G1 were associated with extent of attention to faces in the DVD in G1 (r=0.59, p=.036) but not in G2; IQ was not correlated with improvements in either group

Table 8. Summary of outcomes of social skills studies (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Years±SD IQ, Mean±SD	Key Outcomes
Emotion Recognition Approaches		
Begeer et al. 2010[128] Amsterdam **G1:** Theory of Mind training, 20/19 **G2:** Wait list control, 20/17 Quality: Fair	**G1:** 10.3±1.3 **G2:** 10.3±1.1 **G1:** 100.1 (15.3) **G2:** 103.3 (12.9)	• Study included children with high functioning ASD: 28% diagnosed with Asperger syndrome,67% with PDD-NOS • G1 improved on overall Theory of Mind test vs. G2 (effect size=0.75, p<.03) and on elementary theory of mind tasks (effect size=1.00, p<.01) but not on theory of mind precursors (e.g., perception, emotion recognition) • Significant improvements for G1 vs. G2 on some emotional awareness measures (multiple emotions, effect size=0.84, p<.05); complex emotions, effect size=1.19, p<.01) • No effects on self-reported empathy or parent-reported social skills
Paynter et al. 2013[133] Australia **G1:** Thought bubble intervention 17/9 **G2:** Control 9/6 Quality: Fair	**G1:** 79.41±20.20 months **G2:** 94.86±28.69 months NR	• Within-subjects rather than between-subjects statistical design • G1 showed within-group significant improvements on trained false-belief concept, generalization false belief test, and developmental Theory of Mind Scale following thought bubble training. G2 did not show any significant improvement pre- and post- test on Theory of Mind variables • Improvements were maintained at 3-week followup in G1; no significant improvements in G2 • Seven children in the thought bubble intervention group and 1 child in the control group were not available at followup

ADOS = Autism Diagnostic Observation Schedule; ASD = autism spectrum disorder; G = group; N = number; PDD-NOS = Pervasive Developmental Disorder-Not Otherwise Specified; SD = standard deviation

Play/Interaction-Based Interventions

Key Points

- Twelve studies addressed interaction-based approaches: three good and eight fair quality RCTs and one poor quality prospective cohort.
- Studies of interventions targeting joint attention and delivered by teachers, parents, and interventionists reported gains in joint attention skills in treatment groups compared with controls typically over a short duration (8 to 16 weeks). Children in both treatment and comparison groups, typically received early intervention in addition to the targeted intervention.
- One small, poor quality study of an intervention targeting pretend play showed an increase in play dialog in both groups, with a greater increase in the intervention group.
- Studies targeting parental responsiveness to child communication reported increases in responsive parent behaviors in the treatment arms and limited increases in child communication.

Overview of the Literature

In addition to seven (reported in nine publications) comparative studies (two RCTs of fair[139-141] and five of poor[142-147] quality) addressing play- or interaction-based approaches described fully in the 2011 review, we identified 12 studies (reported in 16 papers) evaluating such interventions for the current review (Table 9). Among these 12 studies, one includes a population

addressed in the 2011 review.[140, 141, 148, 149] We considered three studies in the current review to be of good quality,[150-153] eight of fair quality,[140, 141, 148, 149, 154-160] and one of poor quality.[161] Studies were conducted in the United States[140, 141, 148-154, 156-158, 160, 161] and Europe[155, 159] and included a total of 383 participants between the ages of 21 and 82 months. Intervention duration ranged from 6 to 16 weeks; three studies reported long term (≥12 months post-intervention) followup of participants.[140, 141, 148-150, 156] While all studies used approaches incorporating focused interactions directed by teachers or interventionists[140, 141, 148, 149, 151-153, 155, 157-159, 161] or parents/caregivers,[150, 154, 160, 162] studies typically addressed outcomes related to joint attention, pretend play, imitation, or child/parent communication.

Detailed Analysis

Studies Addressing Joint Attention Outcomes

A fair quality pilot RCT evaluating a teacher-implemented joint attention intervention randomized child-teacher dyads in public preschools to either intervention (n=9 children, mean child age=46 ±5 months, mean mental age=30.3 ±5.01 months) or wait list control (n=7, mean age=43.01±6 months, mean mental age=33.8±8.74 months).[157] The manualized JASP/ER (Joint Attention and Symbolic Play/Engagement and Regulation) intervention trained teachers in eleven key strategies including setting up the environment, following the child's lead, imitating the child's play action, contingent language, and modeling joint attention. Teachers received a 1-hour training workshop and 1-hour of individual training with the child from a JASP/ER interventionist per week. Interventionists also instructed teachers to use JASP/ER strategies daily. At the 5-week followup, children in the intervention group improved in total initiations of joint attention and in pointing compared with the control arm ($p<.005$) and in showing ($p<.01$) in classroom observations (large effect sizes for each measure, 1.85 to 2.02). Groups did not differ on measures of looking or giving. Most scores on the Early Social Communication Scales joint attention measures and frequency of joint attention initiations in videotaped interactions did not differ significantly between groups. Object engagement declined and supported engagement improved in the treatment group compared with control (large effect sizes, $d=1.24$ to 1.41, $p\leq.05$). Observations of teachers also demonstrated increased use of JASP/ER strategies in the treatment arm.

In another good quality pilot RCT of JASP/ER, investigators randomized minimally verbal (<10 spontaneous functional communicative words) preschoolers enrolled in intensive ABA-based interventions for at least 12 months to either JASP/ER or control (standard intensive preschool, n=8, mean age=54.68±10.25, mean mental age=13.91±3.85).[151] Treatment group participants (n=7, mean age=48.73±11.68 months, mean mental age=17.21±3.91 months) received 1-hour of JASP/ER training per week in addition to the intensive preschool. At the 3-month followup, the JASP/ER group increased in play types and decreased time unengaged significantly from baseline ($p=.04$). Changes were not significant for the control group. The JASP/ER group also spent less time disengaged during class observations compared with the control group (effect size=1.63, $p=.05$), initiated more requesting gestures (effect size=1.51, $p=.01$) and evidenced more diversity of spontaneous play (effect size=0.81, $p=.04$). Groups did not differ on Early Social Communication Scales variables related to joint attention.

Another fair quality RCT[155] conducted in 59 Norwegian preschools over 8 weeks evaluated a manualized adaptation of a joint attention intervention reported below.[140, 141, 148, 149] Children in the intervention group (n=34, mean age=47.6±8.30 months, DQ=53.3±19.2) attended regular or

specialized ASD preschools and also received up to 80 sessions (20 minutes twice daily, 5 days/week) of intervention focused on promoting joint attention and engagement within play activities. Children in the control group (n=27, age=50.3±8.3 months, DQ=59.9±19.7) also attended regular or specialized preschools. Groups did not differ in number of preschool hours or 1:1 training or support. The control group had greater expressive language age at baseline compared with the treatment group (mean 24.9±12.8 vs. 18.8±10.5, p=.047). At the 8-week followup, frequency of joint attention skills during teacher-child play were significantly better in the treatment group compared with control (effect size=0.44) but the duration of joint engagement did not differ between groups. Duration of joint engagement was greater in mother-child play in the treatment group vs. control (mean 12.2% longer duration of joint engagement, effect size=0.67). Although initiation of joint attention skills increased in the treatment group, group differences were not significant, thus effects on joint attention seen with teachers did not generalize. Frequency of joint attention initiation as measured on the Early Social Communication Scales did not differ between groups. Adjusting analyses to account for expressive language differences did not change results. Further, investigators found no putative moderators (age, DQ, language age, program philosophy) to be significant, suggesting that the intervention may be applicable across developmental levels.[155]

Another fair quality RCT comparing joint attention and symbolic play interventions delivered via an interventionist included 58 children with ASD between 3 and 4 years of age. Investigators assessed language development, joint attention and play skills, and mother-child interactions at pre- and post-intervention and 6 and 12 months after the end of the 5 to 6 week intervention.[140, 141, 148, 149] Children in both groups showed significantly greater growth in expressive language, initiation of joint attention, and duration of child-initiated joint attention over time than did participants in the control group ($p<.01$ to $<.05$, moderate to large effect sizes). Growth in receptive language was not significantly affected by the intervention from pre-intervention to 12 months post-intervention. Children in the symbolic play group also showed significantly more growth in play level than did children in either the joint attention ($p<.01$) or control ($p<.001$) groups.

In a subsequent report on 52 of the 58 RCT participants assessing joint attention quality, both the joint attention and symbolic play groups improved in shared positive affect during joint attention and in shared positive affect with utterances during joint attention at 6 and 12 months post-intervention ($p<.05$) but not at intervention exit.[149] Differences between groups at the 6 and 12 month time points were not significant. The control group generally declined in instances of shared affect over the followup time points. Forty of the 58 participants in the RCT also participated in followup 5 years post-intervention.[148] Fifteen of 20 children in the joint attention group, 14 of 21 in the symbolic play group, and 11 of 17 in the control returned at 5 years; mean age across groups was 8 years and 8 months. Of the 40 participants, five were enrolled in regular education, 17 in regular education with some special education support, and 18 were in special education classrooms; placement did not differ among groups. At followup, 5/15 participants in the joint attention group, 1/14 in the symbolic play group, and 2/11 in the control arm were considered non-spectrum. Thirty-two of the 40 participants achieved valid scores on language assessments at followup. Ability to use spoken language at followup ("passing" the language assessments) was predicted by children's average play level at baseline ($p<.01$). Number of functional play types at baseline predicted greater cognitive skills. Age at baseline, initiation of joint attention, play level and treatment group assignment predicted subsequent vocabulary ability (all $p<.03$); these factors together explained 64 percent of spoken language variability.

In a fair quality RCT of a joint attention intervention adapted from this study[140, 141, 148, 149]investigators randomized 38 caregiver/child dyads to either immediate, parent-mediated treatment (n=19) or a wait list control group (n=19).[150] The 8-week treatment included individualized, developmentally appropriate play routines to promote parents' following of their children's interests and activities. Children in both groups ranged in age from 21 to 36 months (mean=30.82 months, mean mental age=19.2 months). At the end of intervention, children in the treatment group demonstrated less object-focused play, more responsiveness to joint attention, more functional play acts, and more joint engagement than children in the control group ($p<.05$). Groups did not differ in initiations of joint attention, diversity of symbolic play, or unengaged actions. At followup of the treatment group 12 months after the end of intervention, results suggested maintenance of gains in joint engagement, response to joint attention, and reduction of object engagement, but changes in scores were not significant. Types of functional play acts improved in the treatment group at the 12-month followup ($p<.01$). In analyses of potential predictors of outcome, greater caregiver quality of involvement (rated by investigators) predicted increased joint engagement ($p<.05$) but not other play skills or engagement outcomes. Parent-rated adherence or competence did not predict changes in any outcome. Number of hours of other intervention similarly did not predict any outcomes.

A fair quality RCT of a classroom-based joint attention or symbolic play intervention based on the manualized approaches in other studies reported above[140, 141] randomized 14 special education teachers to either a symbolic play followed by a joint attention intervention (n=10 children, mean age=54.50±5.06 months, mean mental age=25.29±15.77 months), the joint attention intervention followed by symbolic play (n children=14, mean age=56.21±10.42, mean mental age=36.25±11 months), or a waitlist control (n children=9, mean age=59.67±10.61, mean mental age=30.38±13.19).[158] Treatment occurred in eight weekly sessions over 8 weeks (4 weeks on either joint attention or symbolic play followed by 4 weeks on the other approach), groups did not differ on play or joint attention behaviors in classroom observations at followup. Children randomized to either treatment arm spent more time in a joint engagement state compared with the control arm (effect size=0.63). In analyses combining the treatment groups, joint engagement time, joint attention responses/minute, joint attention initiations/minute, symbolic play acts/minute, all assessed via classroom observations, increased significantly from baseline to post-intervention (effect sizes of 0.41, 0.43, 0.21, and 0.51 respectively). In investigator-mediated rating of early social communication, the number of joint attention responses increased from baseline (effect size=0.23); children were able to generalize increases in responding to joint attention to a novel individual. Initiation of joint attention did not increase significantly nor did functional play or level of structured play. No potential modifiers (age, ASD severity, mental age) were significantly associated with treatment outcomes.

Another fair quality RCT conducted in Belgium included 36 children (18 in each arm) receiving either standard care in low-intensity rehabilitation centers for children with ASD (focus on communication, social skills, play, and motor skills for 3 to 5 hours/week) or standard care + a joint attention- and imitation-focused intervention delivered for 1 hour/week (two 30-minute sessions for a total of 24 sessions).[159] The joint attention/imitation intervention included games and activities to promote following and initiating requests; gaze following; pointing; initiating joint attention; and gestural, vocal, symbolic, or social imitation. Children ranged in age from 4.07 to 6.92 years, with IQs in the average to mild intellectual disability range (50-105 full scale IQ). After 12 weeks of intervention, the joint attention/imitation group had higher total joint attention scores, improved gaze following, and greater request initiations than the treatment as

usual group (effect sizes 0.11 to 0.22, all p values ≤.05). The number of elicited joint attention acts increased from 6.53 to 8.41 and the number of spontaneous declarative joint attention acts increased from .89 to 1.72 for the treatment group from baseline to followup; correct imitations increased from 34.11 to 41.12. Initiating declarative joint attention decreased significantly for both groups from baseline to followup (p<.05). Scores on measures of imitation did not differ between groups, though both groups improved over time. Higher baseline verbal IQ was associated with gains in imitation in the treatment group (p<.05), but no other variables tested (age, mental age, full scale IQ, performance IQ, baseline imitation and joint attention skills) were statistically significant. Children in the treatment group improved equally regardless of age or IQ level.

Finally, a fair quality RCT of a joint attention intervention assessed the effects of a roughly 7-month home-based parent training approach targeting focusing on faces, reciprocal communication/turn-taking, and joint attention compared with community-based treatment as usual.[160] The 11 participants in the experimental arm had a mean age of 24.6±4 months and mean Mullen expressive language score of 24.6±6.7 (control group: mean age=27.5±3.4, mean expressive language=24.8±6.9). Reported weekly hours, including the joint intervention sessions for experimental group participants ranged from 2.98±1.25 to 17.88±9.06. Hours/week ranged from 6.25±6.49 to 21.35±11.51 in the control arm. At followup 4 weeks post-intervention focusing on faces and responding to joint attention were significantly improved in the treatment group compared with control (p<.001); scores for the treatment arm remained significantly improved vs. the control group from the 4 week to the 8 week followup and from baseline to the 8 week followup. The effect size for between group differences at the 8 week followup on the focusing on faces outcome was 0.84 and 1.18 for responding to joint attention. Effect sizes for initiations of joint attention were not significant. Language outcomes were significantly improved for the treatment group compared with control. While both groups improved over time, Mullen receptive language and Vineland communication scores were significantly better in the treatment vs. control arm (p values <.05). Effect sizes for differences at the 4-week followup were 0.59 (Vineland) and 0.34 (Mullen); scores for the 8-week followup were not reported.

Studies Addressing Pretend Play

One poor quality nonrandomized, crossover study conducted in a private preschool included 12 high functioning children with ASD (age range 55-75 months).[161] Intervention group participants received the Picture Me Playing intervention, which included scripted stories built around specific toys to model and encourage pretend play. Instances of play dialogue increased significantly following intervention for the treatment group compared with control (3.6 times more utterances over baseline vs. 1.79 times, p<.05), though frequency of play utterances in both groups improved from baseline. Gains in pretend play for both groups also generalized to a toy not used in the intervention and without scripted utterances.

Studies Addressing Imitation

A good quality pilot RCT of Reciprocal Imitation Training, which uses naturalistic approaches to promote imitation and social interaction, allocated 27 children to either Reciprocal Imitation Training (n=14, mean age=39.3±7.3 months, mental age=20.8±6.6) for 3 hours/week for 10 weeks or control/treatment as usual (n=13, mean age=36.5±8.00, mental age=17.9±7.5).[152, 153] The interventionist-led imitation training included modeling of play and gestures and contingent imitation of children's responses and actions with toys. Children in both

arms continued to receive between .25 and 25.5 hours of additional intervention per week. Data for 21 of the children was also reported in an earlier pilot,[153] which reported gains in imitation for the treatment group compared with control ($p<.05$). Gains in imitation were associated with the number of spontaneous play acts at baseline. In the followup RCT,[152] the intervention group made more joint attention initiations compared with control ($p<.05$). Intervention participants also improved on the Social-Emotional Scale compared with the control arm ($p=.02$). Changes in imitation were not shown to be associated with gains in social functioning.

Studies Addressing Parent/Child Communication

In a fair quality randomized trial of a focused play intervention, investigators allocated children to either the play intervention (n=36, mean age=58.3±12.7 months) or a control group (n=34, mean age=55.9±11.9 months).[156] Parents of children in the treatment and the control groups could participate in a parent education program focused on advocacy for their children. Parents in the treatment group also participated in a manualized play time intervention, which used home-based sessions (90 minutes/week for 12 weeks) to promote parental engagement and encouragement of child communication. Children in both groups continued to receive a mean of 14 hours (± 5-8 hours) of school programming and individual services such as ABA-based approaches for a mean of 12±10 to 12 hours/week during the treatment phase. Children also received a mean of >12 hours of school or individual services during the 12-month followup period.

In analyses at the end of intervention, maternal synchronization (maternal direction of child attention or utterances in line with toys/actions in which child was already engaged vs. redirecting or not synchronized with child's actions) was significantly greater in the treatment group compared with control (effect size=0.08, $p<.05$). Maternal synchronization was moderated by baseline maternal insightfulness ($p<.05$) and synchronization was greater in those mothers rated as insightful compared with non-insightful (effect size=0.31, $p<.05$). Expressive language scores did not differ between groups at the end of intervention or at followup 12 months post-intervention (effect size for baseline to followup change=0.03, p=ns). Children with baseline expressive language abilities below 11.3 months showed greater gains in language in the intervention group vs. control (effect size=0.25 for 24 children with low language skills). The link between short-term gain in maternal synchronization and long-term language (12 months post-treatment) gains was not moderated by maternal insightfulness, nor did initial language skills moderate the link between gains in maternal synchronization after 12 weeks and long term gains in expressive language.[156]

Another fair quality RCT included 14 participants (age range 28 to 68 months, mean 41.14) randomized to either an adapted More Than Words curriculum focused on teaching parents to understand child communication and promote verbal responsiveness or to a waiting list.[154] Treatment group parents received approximately 12 hours of training and 14 small-group parent-child coaching sessions. Overall, children had mean auditory language age of 14.79 months and expressive age of 20.21 months with greater baseline language abilities in the waitlist group compared with the treatment group. At followup, treatment group parents improved significantly compared with the control group in measures of verbal engagement with their children (p values $\leq.03$). Children in the treatment group increased in prompted communication acts compared with control ($p<.03$), but spontaneous verbal and nonverbal communication acts did not differ between groups.

Table 9. Summary of outcomes of studies of play/interaction-based interventions

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	Key Outcomes
Joint attention studies		
Goods et al. 2013[151] US **G1:** Joint attention intervention, 8/6 **G2:** Control, 7/5 Quality: Good	**G1:** 48.73±11.68 **G2:** 54.68±10.25 **G1:** 37.70±15.21 **G2:** 26.67±10.12	• Joint attention intervention delivered by preschool teachers; G1 demonstrated more spontaneous play types, spent less time unengaged in classroom, and initiated more requesting gestures than G2 (effect sizes 0.81, 1.63, 1.51 respectively, p values≤.05) • No significant group differences on the Early Social Communication Scales measures of joint attention
Kasari et al. 2010[150] US **G1:** Immediate joint attention intervention, 19/19 **G2:** Waitlist control, 19/19 Quality: Good	**G1:** 30.35±0.93 **G2:** 31.31±0.90 **G1:** 64.80±5.35 **G2:** 59.81±3.14	• Joint attention intervention implemented by caregivers. Children in G1 exhibited significantly less object-focused play, responsiveness to joint attention, functional play types, and greater joint engagement than G2 at initial followup (p<.05); gains in joint engagement, responsiveness to joint attention, and types of functional play were maintained at 1-year followup of G1 • Groups did not differ on other/unengaged play time at followup. G1 did not show greater joint attention initiations or diversity of symbolic play compared with G2 • Greater caregiver quality of involvement predicted increased joint engagement
Lawton et al. 2012[157] US **G1:** Immediate joint attention intervention, 9/9 **G2:** Delayed treatment, 7/7 Quality: Fair	**G1:** 46.0±5.00 **G2:** 43.01±6.00 **G1:** 30.3±5.01 **G2:** 33.8±8.74	• Joint attention intervention delivered by preschool teachers. In classroom observations, G1 demonstrated greater initiations of joint attention vs. G2 (effect size=1.85, p<.005) and used more pointing and showing gestures (effect sizes 2.02, 1.85 respectively); no differences in looking or giving • Total joint attention scores on the Early Social Communication Scales did not differ between groups • On intervention exit play observations, no group differences in any joint attention skills • G1 demonstrated less object engagement (effect size=1.41) and more supported engagement (effect size=1.24) compared with G2
Kaale et al. 2012[155] Norway **G1:** Joint attention intervention, 34/34 **G2:** Control, 27/27 Quality: Fair	**G1:** 47.6±8.30 **G2:** 50.3±8.3 **G1:** 53.3±19.2 **G2:** 59.9±19.7	• Joint attention intervention delivered by preschool teachers • G1 demonstrated more frequent joint attention skills in play with teachers vs. G2, with G1 nearly 5 times more likely to demonstrate initiation of joint attention vs. G2 (effect size=0.44); duration of joint engagement with teachers did not differ between groups • G1 spent longer time in jointly engaged play with mothers vs. G2 post-intervention (effect size=0.67); frequency of joint attention skills with mothers did not differ between groups • Frequency of joint attention measured on the Early Social Communication Scales did not differ between groups • Child age, language age, DQ, or preschool treatment approach did not moderate effects

Table 9. Summary of outcomes of studies of play/interaction-based interventions (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	Key Outcomes
Joint attention studies		
Wong 2013[158] US **G1:** Joint attention-symbolic play interventions, 14/14 **G2:** Symbolic play-joint attention intervention, 10/10 **G3:** Waitlist, 9/9 Quality: Fair	**G1:** 56.2±10.4 **G2:** 54.5±5.1 **G3:** 59.7±10.6 **NR**	• No group differences on measures of play or joint attention in classroom observations • Increased time in joint engaged state for G1 and G2 vs. G3 (effect size=0.63) • For G1+G2, joint engagement time, joint attention responses/minute, joint attention initiations/minute, symbolic play acts/minute increased significantly from baseline to post-intervention (effect sizes of 0.41, 0.43, 0.21, and 0.51 respectively) • Increases in joint attention responses from baseline for G1+G2 as measured on the Early Social Communication Scales; no significant increases in functional play level or structured play • No significant modifiers identified
Warreyn et al. 2013[159] Belgium **G1:** Joint attention/imitation intervention, 18/18 **G2:** Treatment as usual, 18/18 Quality: Fair	**G1:** 5.7±0.6 years **G2:** 5.7±0.7 years **G1:** 78.9±15.5 **G2:** 76.9±16.8	• Total joint attention scores more improved for G1 vs. G2 (p<.01); gaze following, initiating requests also significantly improved for G1 vs. G2 (p values <.05) • G1 increased number of elicited joint attention acts by 1.88, number spontaneous declarative joint attention actions by .83, and number correct imitations by 7.01 from baseline • Both groups combined improved in imitation but no between group differences • Initiating declarative joint attention significantly decreased in both groups from baseline to followup (p<.05) • Verbal IQ significantly correlated with growth in imitation for G1 (p<.05); age, mental age, full scale IQ baseline imitation and joint attention skills, performance IQ were not significant modifiers of outcomes
Schertz et al. 2013[160] US **G1:** Joint attention-focused parent training, 11/11 **G2:** Treatment as usual, 12/12 Quality: Fair	**G1:** 24.6±4.0 **G2:** 27.5±3.4 **NR**	• Scores on responding to joint attention significantly improved for G1 vs. G2 at 4-week post-intervention followup (effect size for differences=1.39), as were scores on focusing on faces (effect size=1.24); effects sizes at 8-week followup were 1.18 (responding to joint attention) and .84 (faces) • Mullen receptive language and Vineland communication significantly improved for G1 but not G2; effect sizes for 4 week differences=.59 (Vineland) and .34 (Mullen) • Mullen expressive language improved in both groups from baseline to followup (p<.027)

Table 9. Summary of outcomes of studies of play/interaction-based interventions (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	Key Outcomes
Joint attention studies		
Kasari et al. 2012[140, 141, 148, 149] US **G1:** Joint attention intervention, 20/20 **G2:** Symbolic play intervention, 16/16 **G3:** Control, 16/16 Quality: Fair	**G1:** 43.05±6.863 **G2:** 41.41±6.491 **G3:** 41.31±4.542 NR	• Joint attention interventions delivered by interventionists; children in the intervention groups showed greater growth in expressive language, initiation of joint attention, and duration of child-initiated joint attention than did control group children (p=<.01, <.05); receptive language growth not significantly affected by intervention • Amount of intervention services received post-intervention was not related to growth in skills at followup 12 months after the ~6 week intervention, except for child-initiated joint attention: children receiving fewer hours of additional services showed greater growth in child-initiated joint attention • Quality of joint attention (shared positive affect, shared positive affect with utterances) improved in G1 and G2 at 6 an 12 month followups • At followup of 40/58 participants 5-years post-intervention, 32/40 had passing scores on the Expressive Vocabulary Test of spoken language; only baseline play level predicted ability to use spoken language. • Younger age at baseline, initiation of joint attention, and play level were predictors of spoken language ability at 5-year followup • Greater functional play types at baseline predicted better overall cognitive ability at 5-year followup
Pretend play studies		
Murdock et al. 2011[161] US **G1:** Pretend play intervention, 6/6 **G2:** Comparison, 6/6 Quality: Poor	**G1:** 69.33±5.9889 **G2:** 62.17±6.2102 NR	• Intervention included typically developing peers as play models • Both groups gained play dialog skills from baseline to followup (p=.003), with greater gains in G1 vs. G2 (260% vs. 136%, p=.041) • Participants were able to generalize play dialog skills to a toy not used in the intervention (p=.012) with an increase in play dialog utterances
Imitation studies		
Ingersoll. 2010[152, 153] US **G1:** Reciprocal imitation training, 15/14 **G2:** Control, 14/13 Quality: Good	**G1:** 41.36±4.30 **G2:** 37.20±7.36 NR	• Pilot evaluation of a reciprocal imitation training program • G1 made greater gains in spontaneous and prompted imitation, object imitation, gesture imitation, initiation of joint attention, and on the Social-Emotional Scale than G2 (p values ≤.05) • Number of spontaneous play actions associated with gains in spontaneous imitation and gesture imitation (p<.05) • Changes in imitation skills not associated with social functioning changes in mediation analysis

Table 9. Summary of outcomes of studies of play/interaction-based interventions (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months±SD IQ, Mean±SD	Key Outcomes
Parent-child communication studies		
Siller et al. 2013[156] US **G1:** Parental responsiveness intervention, 36/31 **G2:** Control, 34/31 Quality: Fair	**G1:** 58.3±12.7 **G2:** 55.9±11.9 NR	• Intervention focused on increasing parents' responsiveness to child communication • Mothers of children in G1 demonstrated greater synchronization with child communication vs. G2 (p<.05, effect size=0.08) • No significant effects of intervention on expressive language • Mothers rated as more insightful at baseline had greater gains in synchronization
Venker et al. 2011[154] US **G1:** Parental responsiveness intervention, 7/7 **G2:** Delayed treatment, 7/7 Quality: Fair	**G1+G2:** 41.14±10.40 NR	• Intervention targeting parents' verbal responsive and engagement with child play • Both groups increased prompted communication acts from baseline to followup; in between group comparisons, G1 had greater increases vs. G2 (p<.03) • Number of children increasing spontaneous communication acts did not differ between groups

DQ = developmental quotient; G = group; IQ = intelligence quotient; N = number; NR = not reported; SD = standard deviation

Behavioral Interventions Focused on Associated Behaviors

Key Points

- Five good quality and two fair quality studies evaluated the effects of cognitive behavioral therapy (CBT) on behaviors associated with ASD.
- CBT improved anxiety symptoms and effects were maintained over time in six of the seven studies. The one study that did not show significant benefit compared with control group demonstrated an improvement in anxiety symptoms in the CBT group; however, it was not greater than that seen in the control group. This study was also the only study to use an active control (social recreational therapy) rather than a waitlist or treatment as usual control.
- Two RCTs with treatment as usual control groups demonstrated significant positive effects of CBT on socialization. One study did not demonstrate significant positive effects of CBT on socialization; however, the comparison group engaged in social skills training.
- One small RCT rated as fair demonstrated improvement in emotion regulation after treatment with CBT.
- One good quality RCT demonstrated improvements in executive function in the CBT treatment group compared with control group receiving social skills intervention.
- In a large fair quality RCT, augmentation of risperidone with parent training produced more significant improvement in adaptive behavior, socialization and communication than risperidone alone, but effects were not maintained after one year. This study also evaluated changes in observed appropriate behavior and did not find any between group changes.

Overview of the Literature

We identified nine comparative studies addressing interventions targeting conditions/behaviors commonly associated with ASD in the 2011 review. These studies included four RCTs[163-167] and one nonrandomized trial[168] of fair quality and three RCTs[169-171] and one prospective cohort[172] of poor quality. Studies addressed CBT for anger or anxiety or parent training approaches. In addition to these studies, we identified nine new studies (reported in 15 publications);[165-167, 173-184]two of these nine studies, one evaluating CBT[165, 166, 178] and one assessing parent training plus risperidone,[167, 179-181, 184]report on populations addressed in studies in the 2011 review. As in the 2011 review, studies address either CBT or parent training modalities (Table 10).

Among the studies identified for the current review, eight RCTs evaluated CBT: seven conducted in the United States,[173, 175-178, 182, 183] and one in Singapore.[185] Three studies examined CBT compared with control groups receiving treatment as usual.[173, 177, 182] Three studies examined CBT compared with wait listed controls,[165, 166, 175, 176, 178] one study compared CBT with social recreational therapy,[174] and another with a social skills intervention.[183] Studies included two populations: five studies (reported in multiple publications) included subjects with both ASD and primary anxiety disorder diagnoses,[165, 166, 173, 176-178, 182]and three studies included subjects with ASD only (subjects may or may not have had a formal diagnosis of primary anxiety disorder or studies did not target anxiety).[174, 175, 183] Outcomes measured included improvements in anxiety alone in five studies,[173, 174, 176, 177, 182] improvements in anxiety and daily living skills in one study;[165, 166, 178] improvements in executive function in one study,[183] and improvements in emotion regulation in one study.[175]
Subjects ranged in age from 4 to 16 years. Five study interventions were conducted over 16 weeks,[165, 166, 173, 174, 176-178] one study intervention was conducted over 28 weeks ,[183] one over 32 weeks,[182] and one over 9 weeks.[175] We rated six studies as good quality[165, 166, 173, 174, 176-178, 183] and two as fair.[175, 182]

We identified one fair quality RCT reported in multiple publications and addressing parent training approaches (also reported in the 2011 review).[167, 179-181, 184]The study examined the utility of augmenting risperidone with parent training vs. risperidone alone for treatment of serious behavior problems and irritability. Children had diagnoses of ASD in addition to serious behavior problems as defined by reaching specific cutoff scores on measures of irritability and problem behavior, and ages ranged from 4 to 13 years. Outcomes measured included measures of adaptive behavior in addition to measures of problem behavior and irritability and one observed measure of appropriate behavior.

Detailed Analysis

Most studies investigating CBT as the primary intervention identified anxiety as the target symptom. One good quality RCT measured changes in anxiety symptoms in addition to core ASD symptoms.[177] The study included 36 children ages 7 to 11 with both ASD and primary anxiety disorder diagnoses. Subjects were randomized to an intervention group receiving 16 weekly CBT sessions or a control group receiving treatment as usual. There were no significant group differences with the exception of slightly higher proportion of subjects with Autistic Disorder compared with PDD or Asperger's in the intervention group. Primary outcome measures included the following measures of anxiety; Pediatric Anxiety Rating Scales (PARS), Anxiety Disorders Interview Schedule-IV-Child/Parent Version and Clinical Global Impressions-Severity (CGI-S). Secondary outcome measures included other measures of anxiety

such as the Multidimensional Anxiety Scale for Children-Parent Version and Child Behavior Checklist, a measure of social responsiveness, the Social Responsiveness Scale, and the Columbia Impairment Scale-Parent Version, which assesses interpersonal, social and academic skill. All measures were collected at baseline, the end of the intervention and 3 months following termination of the intervention. At the end of the intervention, large treatment effects were observed in all primary outcome measures. Pediatric Anxiety Scale ratings were reduced by 21 percent in the CBT group vs. 9 percent in the control group. CGI-S scores were more improved in the CBT group than the control group (effect size 1.06, $p<0.01$). On the blinded, clinician-rated Anxiety Disorders Interview Schedule, 38 percent of CBT participants vs. 5 percent of control participants showed clinical remission of anxiety symptoms (effect size 1.37, $p=0.01$). Scores on all measures did not change significantly between the end of intervention and the 3-month followup evaluation. Among secondary outcome measures, group differences were observed with greater improvements on the Columbia Impairment Scale, internalizing symptoms on the Child Behavior Checklist, Revised Children's Manifest Anxiety Scale anxious arousal subscale, total score and social communication and social mannerisms subscales on Social Responsiveness Scale. No group differences were observed on externalizing symptoms of the Child Behavior Checklist, dysphoric mood, oversensitivity and worry subscales of the Revised Children's Manifest Anxiety Scale, or social awareness, social cognition and social motivation subscales of the Social Responsiveness Scale.

Another good quality RCT assessed a CBT-based intervention specifically developed for children with ASD ("Facing Your Fears").[173] The study included 48 children ages 7 to14 with ADOS-confirmed diagnosis of ASD randomized to either the CBT group or treatment as usual. Participants were required to be able to speak in full complex sentences and have clinically significant symptoms of anxiety measured on the Screen for Child Anxiety and Related Emotional Disorders-parent version (SCARED). No group differences were identified relative to age, IQ, sex, parents' marital status, mother's education, ethnicity, specific ASD diagnosis, or use of psychiatric medications. The intervention consisted of 12 multifamily group sessions over 4 weeks following the manualized CBT treatment. The Anxiety Disorders Interview Schedule for Children was performed at baseline and again at the end of the intervention. The CGI-S scale was obtained at the end of intervention. Independent Clinical Evaluators (ICEs) blinded to the participant's condition assigned DSM-IV diagnoses and provided summary codes of clinical severity and interferences called Clinician Severity Ratings. Group differences in severity ratings were noted for all anxiety diagnoses with medium to large effect sizes. The overall number of anxiety disorders at followup was significantly reduced in the intervention group, and there was a large effect size noted in the reduction of generalized anxiety disorder diagnoses. There were no group differences noted in diagnostic status for other anxiety diagnoses. Significant improvement was noted on the CGI-S in the intervention group as compared with the control group (effect size 1.03 and $p=0.003$). The SCARED was repeated at 3 and 6 months for the intervention group and indicated that reduction in anxiety symptoms had been maintained.

A third good quality RCT investigated the effects of the Coping Cat CBT program on anxiety symptoms in 22 children ages 7 to 14 with diagnosis of ASD and at least one primary anxiety disorder.[176] Twelve children were assigned to the intervention group and the remaining 10 children were enrolled as waitlisted controls. There were no baseline group differences with the exception of more children in the control group receiving stimulant medications. The intervention consisted of 16 weekly 60 to 90 minute CBT sessions following the Coping Cat treatment manual. Anxiety measures were repeated just after completion of the intervention and

again at 2 months after completion of treatment. At the completion of the intervention, 58 percent of the intervention group compared with 0 percent of the control group no longer met criteria for a primary anxiety disorder (p=0.003). Spence Children's Anxiety Scale ratings improved significantly in the intervention group (34.92 to 20.08) but not in the control group (32.3 to 31.7) (p=0.02). Co-morbid diagnoses decreased in the intervention group compared with control group from baseline to end of intervention (p<0.001). After 2 months, four of 11 intervention group participants continued to not meet requirements for anxiety disorder diagnosis. The authors reported a number needed to treat for the intervention of 1.72.

A good quality RCT conducted in Singapore compared the effects of CBT to an established social recreational intervention on anxiety symptoms.[174] Seventy children with ASD diagnoses, verbal IQ>80, and perceptual reasoning IQ>90 were randomly assigned to the CBT group (n=36) or social recreational group (n=34). The CBT group had slightly higher verbal IQ (100.25 in CBT group compared with 93.06 in social recreational group), otherwise there were no significant differences between groups. The CBT group underwent 16 weekly 90 minute small group CBT sessions. The social recreation group underwent 16 weekly 90 minute small group sessions following a manualized treatment protocol that included activities aimed at independent living, self-engagement, motor coordination, intellectual stimulation and socialization. The Spence anxiety scale and CGI-S were repeated at the end of treatment, 3 months and 6 months after the end of treatment. Both groups demonstrated reduction in anxiety on the Spence scale between baseline and at 6-month followup; however, only the social recreational group demonstrated reduction in anxiety immediately following intervention. CGI-S scores improved over time for both groups, but group differences at final followup were not significant.

Another fair quality RCT was conducted in the United States[182] evaluating the Building Confidence CBT program modified for use in children with ASD. The study included 12 children ages 7 to 11 years meeting criteria for both ASD and at least one anxiety disorder who had verbal IQs greater than 70 and no other primary psychiatric diagnosis. The intervention group underwent 32 weekly 90 minute sessions and was compared with a treatment as usual control group. There were no significant differences between groups. The outcome measured in this study was diagnosis of anxiety disorder and severity of symptoms at the end of the intervention. At the end of intervention, fewer children in the treatment group had an anxiety diagnosis (p=0.013); severity of anxiety was also more significantly reduced in the treatment group compared with the treatment as usual arm (p=.017)

One good quality RCT reported in multiple publications[165, 166, 178] examined the effects of the Building Confidence CBT program adapted for children with ASD on anxiety symptoms, daily living skills, and, in a subgroup of children, socialization. Forty children ages 7 to 11 with ASD and separation anxiety, social phobia, or obsessive-compulsive disorder and IQ >70 were randomized to the CBT group or to waitlist control group. No group differences were noted with the exception of more children in the CBT vs. control group having comorbid diagnosis of major depressive disorder or dysthymia (18% vs. 0%, respectively). The intervention consisted of 16 weekly 60-90 minute CBT sessions. Assessments of anxiety included the Anxiety Diagnostic Interview Schedule, the Multidimensional Anxiety Scale for Children parent and child reports, and the Clinical Global Impressions-Improvement (CGI-I) scale. Measures of daily living skills included the Vineland and the Parent Child Interaction Questionnaire, which assesses the level of parent involvement in daily living skills. Socialization was measured with the Social Responsiveness Scale in a group of 19 children from the early stages of recruitment. Most measures were repeated at baseline, at the end of the intervention and, for 10 intervention

participants who were still available, at 3 months after the end of intervention. The CGI-I was only collected at the end of intervention and at the 3-month followup. At the end of intervention, 92.2 percent of the intervention group met criteria for positive treatment response based on CGI-I and 64.3 percent no longer met criteria for any anxiety disorder on the Anxiety Disorders Interview Schedule, compared with only 9.1 percent demonstrating positive treatment response on the CGI-I and ($p<0.0001$) and 9.1 percent no longer meeting criteria for anxiety disorder in the control group ($p<0.0001$). Overall this data did not change significantly at the three-month followup period. The MASC scores were significantly lower in the intervention group vs. the control group at followup ($p<0.0001$) for the parental report however the child report did not demonstrate significant differences. This data also did not change significantly at the 3-month followup period. Vineland total daily living and personal daily living raw scores significantly improved for the intervention vs. the control group ($p<0.05$) with effect sizes of 0.45 for total daily living skills and 0.50 for personal daily living skills. Unnecessary parental involvement and parental involvement in child self-care were significantly reduced in the intervention vs. control groups ($p<0.05$ and $p<0.01$, respectively). Treatment effects on the Vineland and parental intrusiveness scales were maintained at 3 months post intervention in the 10 children for whom followup data were available. Among those participants receiving the Social Responsiveness Scale, differences favoring the intervention group were found on three of the five subscales including social communication, social motivation and social awareness ($p<0.05$).

A small, fair quality pilot RCT examined the utility of CBT to improve emotion regulation in a young group of 11 verbal children ages 5 to7 years.[175] Children randomized to the intervention group (n=5) underwent 9 weekly 60 minute sessions of CBT focusing on skill-building, stress management and understanding expression of emotions. The remaining 6 children were randomized to a waitlist control group. This study reported demographic data for all participants but did not present data regarding potential differences between groups. Measures of the child's capacity for emotion regulation was assessed through his report of number emotion regulation strategies that might be used during the reading of a vignette, parental report on an emotion regulation scale, parent observation and notation of frequency and duration of anger/anxiety episodes, and parent report of their own self-confidence and confidence in their children's abilities to handle emotions. Measures were collected at baseline and at the end of intervention. At the end of intervention children in the CBT group reported a greater number of emotion regulation strategies in response to the vignettes (4 vs. 1.29 in control group $p<0.05$, effect size 0.65) and parents had greater confidence in their ability to manage child's anger and greater confidence in the child's ability to manage their own anger ($p<0.05$, effect sizes 0.84 to 0.89).

A good quality RCT investigated the effects of a CBT program, Unstuck and On Target compared with a social skills intervention on 57 children ages 7 to 11 with ASD.[183] Children received either intervention weekly for 28 30-40 minute sessions. All children were required to meet ADOS criteria for ASD, have a full scale IQ greater than 70 and mental age greater than 8 years old. Baseline measures were obtained but not reported. The study does not report at what point post intervention measures were obtained. Both groups improved on most measures from baseline to followup. The CBT group improved significantly more on interventionist-rated measures of problem solving, flexibility, and parent and teacher-rated executive function measures when compared with the social skills group ($p <0.05$ with medium to large effect sizes). In classroom observations, the CBT group demonstrated greater improvement in ability to follow directions, transition smoothly and avoid "getting stuck" (p values <0.05). Higher baseline scores predicted greater improvements in flexible thinking, social tasks, parent- and

teacher-rated executive function shift and planning/organization measure, parent-rated Social Responsiveness Scale total score (p values <0.05). Higher IQ predicted greater improvements in flexible thinking and the challenge task plan measure. Younger age predicted greater improvement on the challenge task and parent-rated executive function measures of shift and planning/organization (p<0.05). Female sex predicted greater improvement on the parent –rated Social Responsiveness Scale total score (p values <0.05).

One fair quality RCT (reported in multiple publications) assessed a parent training approach (treatment with risperidone alone vs. risperidone augmented with a parent-training program) to improving adaptive behavior and communication and socialization skills.[167, 179-181, 184] The parent training program included 11 core sessions, one home visit and up to three optional sessions during the first 16 weeks, followed by four booster sessions over the next 8 weeks. The training focused first on antecedents, purpose, and reinforcements of problem behaviors and then on teaching parents management strategies for these behaviors. Investigators recruited 124 children ages 4 to 14 years with ASD, severe problem behaviors evidenced by positive scales on the Aberrant Behavior Checklist-Irritability subscale and CGI-S subscales, and IQ>35. Forty-nine participants were randomized to risperidone plus parent training intervention group and 75 to the risperidone alone control group. No group differences were observed with the exception of slightly higher ABC-irritability subscale scores in the intervention group.

The Aberrant Behavior Checklist, Vineland, the Home Situations Questionnaire, and the Standardized Observation Analogue Procedure were completed at baseline, at 24 weeks after completion of intervention and, for the Aberrant Behavior Checklist and Home Situations Questionnaire, one year after intervention. At 24 weeks, scores on the Home Situations Questionnaire demonstrated decreased severity in more children in the intervention group vs. control (p<0.006), and greater improvements were noted in the intervention group on the Aberrant Behavior Checklist Irritability (p=0.01), Stereotypic behavior, (p=0.04) and Hyperactivity (p=0.04) subscales compared with the control group. Also at 24 weeks post intervention, greater improvements in the intervention group were noted on Vineland socialization (p=0.01) and adaptive composite (p=0.05) standard scores and on Vineland noncompliance (p=0.03), socialization (p=0.03) and communication (p=0.05) age equivalent scores. These treatment gains were not associated with IQ or adaptive or maladaptive behaviors. Analysis indicated higher baseline Home Situations Questionnaire scores predicted greater improvement regardless of treatment (p=0.007). Authors also analyzed 21 potential moderator variables and none significantly moderated Home Situations Questionnaire or Aberrant Behavior Checklist-Hyperactivity scores, suggesting that parent training may be effective for a range of children. Scores on the standardized observation measure indicated no between group differences in child inappropriate behavior in direct observations under various conditions (free play, restrictive, etc.). In analyses combining both groups, child inappropriate behavior decreased from baseline in the demand and tangible restrictive conditions (p values<.01). Additionally, this measure reported an increase in compliance in the demand condition (p=.0004) when groups were combined.

At 1-year followup, data were available for 87 participants. Group differences at one year on the Home Situations and Aberrant Behavior Checklists were no longer significant. Data were not available for Vineland at one-year followup.[167, 179-181]

Table 10. Summary of outcomes of studies of interventions targeting conditions commonly associated with ASD

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Years±SD IQ, Mean±SD	Key Outcomes
CBT Studies		
Storch et al. 2013[177] US **G1:** CBT, 24/22 **G2:** Usual care, 21/21 Quality: Good	**G1:** 8.83±1.31 **G2:** 8.95**±**1.40 NR	• Significantly greater improvements in all primary outcomes for G1 compared with G2; effect sizes ranged from 0.84 to 1.06 • Pediatric Anxiety Rating Scale ratings were reduced by 29% for G1 vs. 9% for G2 (effect size=1.03, p<.01) • CGI-S improved from a mean 3.50 for G1 at baseline to 2.67 at followup compared with baseline mean of 4.00 and followup of 3.57 for usual care (effect size=1.06, p<.01) • On the blinded, clinician-rated Anxiety Disorders Interview Schedule, 38% (9/24) G1 participants vs. 5% (1/21) G2 participants achieved clinical remission of anxiety symptoms (effect size=1.37, p=.01) • At followup of G1 three months post-treatment, 11/15 maintained treatment response and 6/9 maintained remission (p=NS); scores on the CGI-S, Anxiety Disorders Interview Schedule, and Pediatric Anxiety Rating Scale did not change significantly from end of treatment
Keehn et al. 2013[176] US **G1:** CBT, 12/12 **G2:** Wait list control, 10/10 Quality: Good	**G1:** 11.65**±**1.41 **G2:** 11.02±1.69 **G1:** 108.42±17.70 **G2:** 110.40**±**17.39	• On blinded, clinician-rated Anxiety Disorders Interview Schedule, 58% of G1 no longer met criteria for primary anxiety diagnosis at followup; 100% of G2 still met criteria (p=.003) • Parent-reported Spence Children's Anxiety Scale ratings improved over time for G1 compared with G2 (baseline means: G1=34.92, G2=32.20; at followup G1=20.08, 31.70, p=.02) • Co-morbid diagnoses decreased in G1 compared with G2 from baseline to followup (p<.001) • 4/11 treatment group participants with 2-month post-treatment followup data continued not to meet criteria for anxiety diagnosis • NNT=1.72
Reaven et al. 2012[173] US **G1:**CBT**,** 24/21 **G2:** Usual care, 26/26 Quality: Good	**G1:** 125.75 months±21.47 **G2:** 125.00 months±20.45 **G1:** 107.08**±**16.85 **G2:** 102.23±17.33	• Blinded clinician severity ratings significantly reduced from baseline for all anxiety diagnoses in G1 compared with G2; effect sizes ranged from medium to large • Significant reduction in overall number of anxiety disorders in G1 compared with G2 at followup; large effect size for reduction in generalized anxiety disorder diagnoses (effect size=0.85) but no significant between group differences in diagnostic status for other anxiety diagnoses • 50% of G1 and 8.7% of G2 had clinically meaningful improvement in anxiety symptoms on the CGI-S (effect size=1.03, p=.003) • At 6 month post-intervention followup for G1, parent and child SCARED scores suggested maintenance of reduction of anxiety symptoms

Table 10. Summary of outcomes of studies of interventions targeting conditions commonly associated with ASD (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Years±SD IQ, Mean±SD	Key Outcomes
CBT Studies		
Sung et al. 2011[174] Singapore **G1:** CBT, 36/36 **G2:** Social recreational program, 34/34 Quality: Good	**G1:** 11.33±2.03 **G2:** 11.09±1.53 **G1:** 100.25±13.97 **G2:** 93.06±12.81	• Both groups reported reductions in anxiety from baseline to end of treatment; reports of panic attacks were significantly reduced from baseline in G2 (p<.01); differences between groups at final followup (6 months post-treatment) were not significant • CGI-S scores improved over time in both groups, but between group differences at final followup were not significant
Drahota et al. 2011[165, 166, 178] US **G1:** CBT, 17/14 **G2:** Wait list control, 23/22 Quality: Good	**G1:** 9.18 ±1.42 **G2**: 9.22 ±1.57 NR	• 92.9% of G1 met criteria for positive treatment response; 64.3% of G1 no longer met criteria for any anxiety disorder on the Anxiety Disorders Interview Schedule • Multidimensional Anxiety Scale for Children scores were significantly lower (i.e., reduction in anxiety) in G1 vs. G2 at followup (p<0.0001) with maintenance of response for G1 at followup 3-months post-intervention • Vineland total daily living and personal daily living raw scores significantly improved for G1 vs. G2 at followup (p≤.05); effect sizes were 0.45 (total daily living skills) and 0.50 (personal daily living skills) • Mean age equivalency for total daily living skills increased from 5.2 years at baseline to 6.0 for G1 and from 5.4 years at baseline to 5.7 for G2; for personal daily living skills, mean age equivalency increased from 4.1 to 5.0 years in G1 and 4.5 to 4.6 years in G2 • Unnecessary parental involvement and parental involvement in child self-care were significantly reduced in G1 vs. G2 (p<.05, p<.01 respectively) • Treatment effects on the Vineland and parental intrusiveness scales were maintained at followup 3-months post-intervention for 10 children with followup data
Fujii et al. 2013[182] US **G1:** CBT, 7/7 **G2:** Treatment as usual, 5/5 Quality: Fair	**G1:** 8.7±1.8 **G2:** 9.0±1.6 **G1+G2:** >70	• At followup after 32 weeks of intervention, 5/7 G1 participants no longer met diagnostic criteria for primary anxiety diagnosis; 1 participant retained diagnosis of social phobia disorder and 1 retained generalized anxiety disorder diagnosis • All control group participants retained anxiety diagnoses at followup: 2 with separation anxiety, 3 social phobia disorder

Table 10. Summary of outcomes of studies of interventions targeting conditions commonly associated with ASD (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Years±SD IQ, Mean±SD	Key Outcomes
CBT Studies		
Kenworthy et al. 2013[183] US **G1:** School-based CBT executive function intervention, 47/43 **G2:** Social skills intervention, 20/19 Quality: Good	**G1:** 9.49±1.0 **G2:** 9.58±1.1 **G1:** 108.8±18.5 **G2:** 107.63±17.2	• Both groups improved on most measures from baseline to followup; G1 improved significantly more on interventionist-rated measures of problem solving, flexibility, and parent and teacher-rated executive function measures (shift, planning/organization) compared with G2 (p values <.05, medium to large effect sizes) • In classroom observations, greater improvement in G1 vs. G2 ability to follow directions, transition smoothly, and avoiding "getting stuck" (p values<.05) • Higher baseline scores predicted greater improvements in flexible thinking, social tasks, parent- and teacher-rated executive function shift and planning/organization measure, parent-rated Social Responsiveness Scale total score (p values <.05) • Higher IQ predicted greater improvements in flexible thinking, challenge task plan measure; younger age at baseline predicted greater improvement on challenge task plan measure and parent-rated executive function measures of shift and planning/organization (p values <.05) • Female sex predicted greater improvement on parent-rated Social Responsiveness Scale total score (p values <.05)
Scarpa et al. 2011[175] US **G1:** CBT, 5/5 **G2:** Delayed treatment control, 6/6 Quality: Fair	**G1+G2 (range):** 5-7 years **IQ:** NR	• Pilot study to assess utility of CBT approach to improve emotion regulation (Sofronoff, 2005, 2007) in younger children • G1 articulated significantly greater number strategies in response to vignettes than G2 (mean 4 vs. 1.29, p<.05, effect size=0.65) • Greater parental confidence in own ability to manage child's anger and greater confidence in child's ability to manage anger and anxiety in G1 vs. G2 (p<.05, effect sizes=0.84 tob0.89)

Table 10. Summary of outcomes of studies of interventions targeting conditions commonly associated with ASD (continued)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Years±SD IQ, Mean±SD	Key Outcomes
Parent Training Studies		
RUPP 2012[167, 179-181, 184] **G1:** Risperidone, 49/36 (1-yr followup) **G2:** Risperidone+parent training, 75/51 (1-yr followup) Quality: Fair	**G1:** 7.5±2.80 **G2:** 7.38±2.21 IQ>70, n (%) **G1:** 23 (46.9) **G2:** 46 (63) IQ<70, n(%) **G1**: 26 (53.1) **G2:** 27 (37)	• After 24 weeks of treatment, significant group by time interaction on the Home Situations Questionnaire (HSQ) (p<0.006); HSQ scores declined (i.e., decreased severity) in more children in G2; Aberrant Behavior Checklist (ABC) irritability, stereotypic behaviors, hyperactivity subscales all showed significant group differences over time with less severe symptoms in each of the domains in G2 • After 24 weeks, Vineland socialization and adaptive composite standard scores and socialization, noncompliance, and communication age equivalent scores were significantly better in G2 vs. G1 (p≤.05, effect sizes ranging from 0.14 to 0.35); treatment gains were not associated with IQ or adaptive or maladaptive behaviors • Higher baseline HSQ scores predicted greater improvement regardless of treatment (p=.007); effect size of 0.81 (p<.01) for those with greater severity • Of 21 potential moderator variables (e.g., child age, maternal education) none significantly moderated HSQ or ABC-Hyperactivity scores, suggesting that parent training may be effective for a range of children • At followup of 87 participants 12-months post-intervention, between group differences on the HSQ or ABC were no longer significant • No between group differences in child inappropriate behavior in direct observations under various conditions (free play, restrictive, etc.); in analyses combining G1 and G2, child inappropriate behavior decreased from baseline in the demand and tangible restrictive conditions (p values<.01); increase in compliance in the demand condition (p=.0004)

ABC = Aberrant Behavior Checklist; ASD = autism spectrum disorder; CBT = cognitive behavioral therapy; CGI = Clinical Global Impression; G = group; HSQ = Home Situations Questionnaire; IQ = intelligence quotient; N = number; NR = not reported; RUPP = Research Units on Pediatric Psychopharmacology; SCARED = Screen for Child Anxiety Related Disorders; SD = standard deviation

Other Behavioral Interventions

Key Points

- In one study comparing CBT plus melatonin to either melatonin or CBT alone, all participants improved on measures of sleep quality, with the combination group generally improving more than the others.
- One small, short-term study of a sleep education pamphlet for parents demonstrated little positive effect of the pamphlet; similarly, a short-term study of parent training in sleep routines reported some within-group improvements in time to fall asleep.
- Small, short-term studies of neurofeedback reported some improvements on parent-rated measures of communication and tests of executive function

Overview of the Literature

We classified studies not cleanly fitting in any of the other categories as "other." In addition to two poor quality RCTs targeting neurofeedback[186, 187]and described fully in the 2011 review, we identified six new studies (seven publications) evaluating interventions targeting sleep behaviors,[188-190] feeding difficulties in ASD,:[191] and neurofeedback [192-194] (Table 11).We considered one RCT comparing the effects of CBT with or without melatonin with placebo on sleep habits as fair quality,[189] two RCTs evaluating the effects of sleep education as fair quality,[188, 190] and two studies (reported in three publications)[192-194]of neurofeedback as fair[192] and poor[193, 194] quality, and one study targeting mealtime behaviors as poor quality.[191] Studies were conducted in Europe[189, 192-194] and the United States[188, 190, 191] and included 303 total participants with ages ranging from 2 to 12 years. Duration of intervention ranged from 3 to 12 weeks.

Detailed Analysis

One fair quality RCT compared CBT alone, melatonin alone, CBT plus melatonin, and placebo in 160 children with ASD between the ages of 4 and 10 years.[189] CBT consisted of four 50-minute sessions focused on recognizing dysfunctional attitudes about sleep, parent-management of children's sleep, and replacing poor sleep habits with appropriate behavior. Participants received 3 mg controlled release melatonin administered at the same time each day. Investigators allocated 40 participants to each group; mean age across groups ranged from 6.3 to 7.1 years, and each group lost 5 to 8 participants over the 12-week intervention due to withdrawals or missing actigraphy data. All active treatment groups improved in most measures of sleep quality compared with the control group ($p<.01$). In general, the combination group improved more than the others, followed by the melatonin alone and CBT alone groups. Scores for children who received melatonin alone improved on bedtime resistance, sleep onset delay, sleep duration, and night waking compared with the CBT group ($p<.001$). Effect sizes (exact data not reported) ranged from medium to high. Sleep onset latency (time to fall asleep) and sleep efficiency (ratio of total sleep time to total time in bed) were reduced by 50 percent (sleep latency) or 85 percent (efficiency) in 85 and 63 percent of children in the combination group and 39 and 46 percent of children in the melatonin group, respectively. In the CBT arm, 10 percent of children met each criterion, and no children in the control arm achieved these percentages of reduced latency or improved efficiency. The study reported no significant harms.

One fair quality RCT evaluated the effects of a sleep education pamphlet compared with no intervention in 36 children with ASD between the ages of 2 and 10 years.[188] Parents of children

in the intervention group received a four-page pamphlet with information about sleep environment, promoting bedtime routines and schedules, teaching children to fall asleep alone, avoiding naps where possible, and promoting a sleep/wake schedule; parents did not receive additional instruction. At the 2-week followup, groups did not differ significantly on sleep latency, waking after sleep onset, total sleep time, or sleep fragmentation. Sleep efficiency (total sleep time/time in bed) improved slightly in the intervention group (baseline mean 75.5%±6.1, followup 77.8%±7.0 vs. baseline mean of 76.8%±6.0, followup 75.1%±6.7 for the control group, p=.04).

A final fair quality RCT assessed short-term group or individual format sleep education for parents.[190] Participants (n=80) received 1 to 4 hours of education focused on bedtime routines, sleep environment, and sleep resistance in ASD. Followup measures did not differ for any outcome at followup; however, in analyses combining data for the group and individual-education arms, sleep latency (time to fall asleep) was significantly reduced from baseline (p<.001) as was sleep efficiency (p<.001), though the improvement in efficiency (% sleep time out of total time in bed) was not clinically meaningful. Insomnia-related parameters on the parent-rated Children's Sleep Habits Questionnaire (sleep onset delay, night wakings, sleep duration, bedtime resistance, sleep anxiety) were also significantly improved from baseline to followup (all p<.001) in combined analyses.

In a nonrandomized trial including 14 high functioning children with PDD-NOS (IQ≥70) investigators assigned children to 40 sessions of neurofeedback (n participants=7, mean age=9.63±1.53 years) sessions designed to treat individuals with ADHD or to a wait-list control group (n=7, mean age=10.64±1.41 years).[194, 195] Electroencephalogram data did not differ significantly between groups at followup; however, the treatment group improved on some executive function measures (auditory selective attention, inhibition of verbal responses and impulsive tendencies, all p<.05) and in nonverbal communication compared with the control group. Cognitive flexibility and goal setting improved for the treatment group vs. control but ability to recognize words did not. Parents of children in the treatment arm also rated their children's communication skills as improved following neurofeedback training. In analyses 12-months post-treatment combining data for the treatment and control group participants who went on to complete neurofeedback training (n=NR), gains in auditory selective attention, non-verbal communication, and parent measures of social behavior continued.

In an RCT evaluating neurofeedback, 10 children (mean age=9.43±1.44 years) received 40 neurofeedback sessions aimed at decreasing theta power in the frontal and central brain areas. Ten children served as controls (mean age=9.14±1.34 years); the study did not specify if control children received any type if intervention.[192] In contrast to the prior neurofeedback study, children had diagnoses across the ASD spectrum, treatment occurred in school and at home, and both parents and teachers completed outcome questionnaires. Immediately after treatment, theta activity was reduced in 60 percent of the intervention group. Social behavior, especially reciprocal social interaction, as measured on the parent-rated Social Communication Questionnaire, improved for the treatment group compared with control (p<.05) as did scores on the Children's Communication Checklist and on the set-shifting domain of executive function (p<.05). Scores on other domains of executive function did not differ between group nor did scores on teacher-rated measures. At followup 6-months post-treatment, the intervention group showed continued improvement on parent-rated measures of social behavior, communication, and repetitive behavior as well as set-shifting compared with the control arm (p<.05) Parents were not blinded to treatment condition.

Finally, one poor quality RCT assessed the effectiveness of an 8-week manualized parent training program on mealtime behaviors.[191] Baseline BMI among the 19 participants (age range 68-91 months) was in the normal range. Between group differences at followup were not significantly different on any mealtime behavior measures. Parenting stress was significantly reduced in the treatment group compared with the waitlist control (p=.01).

Table 11. Summary of outcomes of behavioral-other studies

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Years±SD IQ, Mean±SD	Key Outcomes
Cortesi et al. 2012[189] Italy **G1:** Melatonin+CBT, 40/35 **G2:** Melatonin alone, 40/34 **G3:** CBT alone, 40/33 **G4:** Placebo, 40/32 Quality: Fair	**G1:** 6.4±1.1 **G2:** 6.8±0.9 **G3:** 7.1±0.7 **G4:** 6.3±1.2 NR	• G1, G2, and G3 improved in measures of sleep compared with G4 (p<.01), with G1 improving more than the others, though not significantly • On actigraphy measures, G1 improved more than G2 and G3 • Primary effects of CBT alone were on sleep latency and sleep anxiety
Malow et al. 2014[190] US **G1:** Individual sleep education for parents, 41/41 **G2:** Group-based sleep education for parents, 39/39 Quality: Fair	**G1:** 5.6±2.6 **G2:** 5.9±2.8 **% IQ>70** **G1:** 64 **G2:** 45	• No between group differences on any measure • Sleep latency (# minutes to fall asleep) improved from baseline to followup when data from both arms combined (mean 58.2±29.1 minutes to 39.6±21.4 minutes, p<.001) as did sleep efficiency (76.3 ±6.9% to 79.2±5.5%, p<.001),insomnia-related subscales of the Children's Sleep Habits Questionnaire and measures related to sleep habits
Adkins et al. 2012[188] US **G1:** Sleep education pamphlet, 18/18 **G2:** No intervention, 18/18 Quality: Fair	**G1+G2:** 6.4±2.6 **G1:** 75.1±25.5 **G2:** 85.6±27.1	• No between group differences in sleep latency, waking after sleep onset, total sleep time, or sleep fragmentation at the 2 week post-intervention followup • Sleep efficiency improved somewhat in G1 vs. G2 (p<.04)
Kouijzer et al. 2009[194, 195] US **G1:** Neurofeedback, 7/7 **G2:** Control, 6/6 Quality: Poor	**G1:** 9.63±1.53 **G2:** 10.64±1.41 **G1:** 92.5±16.05 **G2:** 93.83±13.67	• Improvements in some measures of executive function in G1 vs. G2 (p<.05); improvements in nonverbal communication and parent-rated communication and behavior measures in G1 vs. G2 • Analyses combining groups (G1 and some G2) suggested maintenance of improvement in social behavior
Kouijzer et al. 2009[192] US **G1:** Neurofeedback, 10/10 **G2:** Control, 10/10 Quality: Fair	**G1:** 9.43±1.44 **G2:** 9.14±1.34 **IQ:** NR	• Parent-rated scores in reciprocal social interaction and communication improved for G1 vs. G2 (p<.05) • Set-shifting skills improved for G1 vs. G2 (p=.045); parent-rated measures at 6 months post-treatment suggested maintenance of improvements in communication and set-shifting for G1
Sharp et al. 2013[191] US **G1:** Parent training in mealtime behaviors, 15/10 **G2:** Waitlist, 15/9 Quality: Poor	**G1:** 70.8±20.5 **G2:** 64.8±16.9 NR	• Participants had BMI in normal range at baseline and no specific feeding issues set a inclusion criteria • No significant group differences at followup in terms of feeding behavior, food refusal, food selectivity, "autism features" as rated on mealtime behavior inventory

CBT = cognitive behavioral therapy; G = group; IQ = intelligence quotient; NR = not reported; SD = standard deviation

KQ2. Modifiers of Treatment Effects

Key Points

- Not all studies were adequately designed or powered to assess modifiers of effects.
- Associations of outcome and baseline measures of cognition, adaptive behavior, language, and ASD severity were mixed across studies.
- In early intervention studies, younger age was associated with greater improvements, though effects were not always consistent.

Overview of the Literature

Understanding the degree to which child characteristics (i.e., specific ASD-related difficulties and skills), treatment factors (e.g., type, duration, intensity), and systems (e.g., family, community) influence response to treatments could improve targeting of treatments to the appropriate children and circumstances. Twenty papers (described in multiple publications) reported predictor, moderator, or mediator data;[72, 76, 77, 79, 81-84, 86, 87, 90, 93, 95, 100, 101, 105, 123, 124, 132, 152, 153, 156, 159, 167, 179-181, 183] however, not all studies were adequately designed or powered to assess modifiers of effects.

Detailed Analysis

Child-Related Factors

Age

As in the 2011 review, several studies reported associations between age at intake and improved outcomes. In one RCT of an approach incorporating parent training, younger age was associated with greater improvements: greater language gains were seen in children who were younger with lower functioning levels at baseline.[72, 105]

Age effects were not consistent, however, and may reflect characteristics of subgroups and treatment characteristics that need further elucidation. For example, one study comparing preschool-delivered intensive early intervention and treatment as usual reported larger adaptive behavior gains for older children in the early intervention group.[77] Another RCT compared early intensive treatment delivered by parents and by specialized center staff with eclectic treatment and identified predictors of progress: in the parent training group, older children achieved better adaptive behavior outcomes; younger children made more gains in early language comprehension and production.

In a retrospective cohort study of a community-based early intervention program, outcomes were related to age at enrollment, treatment duration, and higher baseline adaptive scores. A significant interaction emerged between age at enrollment and group membership, with younger starting age influencing outcomes for the treatment group but not the waitlist control.[86] In contrast to the early intervention studies, in an RCT assessing emotion recognition, older age was correlated with improved identification of fear expressions, affect recognition, and the mind reading desire based task.[123] Another RCT of a preschool-based joint attention intervention compared an 8-week treatment program focused on increasing initiating, giving, and sharing joint attention skills plus preschool to preschool alone in 61 children with ASD.[155] In exploratory analyses, investigators found no putative moderators (age, developmental quotient, language age,

program philosophy) to be significant, suggesting that the intervention may be applicable across developmental levels.

IQ/Cognition

Associations of outcome and IQ or measures of cognition were mixed across studies. Intervention efficacy was associated with baseline cognitive scores in one early intervention study comparing preschool models classrooms,[83] with higher baseline cognitive scores associated with less improvement in children in TEACCH model classrooms. In an early intervention prospective cohort study, baseline IQ was positively correlated with socialization, communication, daily living, and composite score gains on the Vineland in the treatment group; however, baseline IQ did not correlate with IQ at followup.[77] In another early intervention study, higher pre-treatment mental development state and early language skills predicted better outcome on parent-reported adaptive behaviors in the eclectic treatment group.[101, 102] In a study assessing emotion recognition, higher verbal IQ was associated with some short term improvements in fear recognition and mind reading tasks,[123] while in another emotion recognition RCT, IQ was not correlated with improved outcomes in either the treatment or control groups.[132] In another RCT of a group-based social skills approach, IQ was not associated with response status;[124] similarly, treatment gains were not associated with IQ in an RCT comparing parent training plus risperidone to risperidone alone.[167, 179-181] In one study of CBT focused on executive function outcomes, higher baseline scores predicted greater improvements in flexible thinking, social tasks, parent- and teacher-rated executive function shift and planning/organization measure, parent-rated Social Responsiveness Scale total score (p values <0.05). Higher IQ predicted greater improvements in flexible thinking and the challenge task plan measure. Younger age predicted greater improvement on the challenge task and parent-rated executive function measures of shift and planning/organization ($p<0.05$). Female sex predicted greater improvement on the parent –rated Social Responsiveness Scale total score (p values <0.05). [183] In a play-interaction study targeting imitation and joint attention, higher baseline verbal IQ was associated with gains in imitation in the treatment group ($p<.05$), but no other variables tested (age, mental age, full scale IQ, performance IQ, baseline imitation and joint attention skills) were statistically significant. Children in the treatment group improved equally regardless of age or IQ level.[159]

ASD Severity/Symptom Severity and Diagnoses

In some studies, children with lower symptom severity or less severe diagnoses improved more than participants with greater impairments. In an RCT assessing ABA-based early intervention, lower baseline ASD severity was associated with parent-reported cognitive and adaptive growth for children who received eclectic vs. ABA intervention, but not with improvements in standardized cognitive test scores.[81, 82] A prospective cohort study of preschool-based early intensive intervention reported that children in the early intervention group with PDD-NOS or Asperger diagnoses (but not autism) had greater gains in overall adaptive behavior, communication, and daily living skills.[77] A prospective cohort study comparing four early intervention approaches (home-based 1:1 ABA intervention, low intensity home-based programming for children with special needs [portage], home-based, local health authority-developed intervention incorporating parent training, and special education nursery/preschool) evaluated relationships between ASD severity, time in intervention, and effectiveness of intervention.[95] Hours of intervention ranged from 2 to 40 across groups, with the home-based

ABA group receiving the most (mean 30.4/week) and the Portage group the least (mean 8.5/week). Baseline ASD severity and total intervention hours modified effects of treatment significantly. First, baseline ASD severity was inversely related to composite change scores for all but the home-based ABA group and was positively related in that group. That is, children with more severe ASD symptoms made more progress in ABA and less in the other intervention groups. Second, more intervention time was negatively related to composite change scores for children in ABA but not in the other groups. More hours of ABA were associated with less progress relative to more hours of school enrollment or other home-based interventions.

Two reports[88, 90] including participants in a retrospective cohort study evaluating an early intervention approach[86] assessed potential outcome predictors including baseline age, Vineland scores, IQ, and ASD severity (CARS). Younger age at intake, higher initial developmental levels[90] and treatment intensity[88, 90] were related to better treatment outcomes. Vineland standard scores and IQ and mental age were higher for the 32 children whose followup standard scores on cognitive and/or adaptive behavior were in the low average range or better (>85) and whose CARS scores were in or very close to the non-ASD range (<30), Similarly, these "average outcome" children had significantly lower intake CARS severity scores, began intervention earlier (mean 42 months vs. 55 for rest of sample), and received intervention for a longer duration. More of these children also had diagnoses of PDD-NOS. Children who had poor outcomes at followup (n=75) had statistically significantly lower baseline IQ , mental age, rate of development, and Vineland scores (except for the socialization domain), with p values ranging from .01 to <.001. Differences likely were not clinically significant, however, and diagnostic category, severity, age at entry, and duration of therapy were not significantly different in the poor outcome group compared with the rest of the sample.

In an RCT evaluating an emotion recognition intervention, long term improvements in identification of happiness expressions were associated with greater ADOS severity, as was matching of emotions overall and of sadness specifically.[123] In an RCT of a theory of mind training program, children with PDD-NOS improved on most measures of emotion recognition while children with Asperger syndrome improved only in understanding of complex emotions.[128] In another RCT of a group-based social skills approach, children with Asperger syndrome were more likely to be responders compared with children with PDD-NOS (p=.03).[124]

Finally, an RCT assessing a parent training approach targeting challenging behaviors examined 21 candidate predictors and moderators of outcome scores on the Home Situations Questionnaire (HSQ) and the Aberrant Behavior Checklist, Hyperactivity/Noncompliance (ABC-H) scale.[167, 179-181] Children received either parent training plus risperidone (n=75, mean age=7.4) or risperidone alone (n=49, mean age=7.5); thus, potential moderation of effect reflects the combination of parent training and risperidone while predictors of effects reflect the impact of risperidone with or without parent training. Investigators examined variables including parent training adherence, age, IQ, family income, maternal education level, parent stress, and child baseline ratings on measures including the Vineland and ABC. Only higher baseline scores on the HSQ (greater noncompliance) predicted greater improvement in either treatment condition (p=.007), with the lower HSQ group demonstrating less mean improvement than those with higher baseline HSQ scores. Though not significant, older children had slightly more improvement than younger children. No variables predicted ABC-H outcomes, though children with higher baseline Vineland composite and communication subscale scores had greater improvement on the ABC-H. While not a significant predictor of outcomes, greater parent adherence to the training program was correlated with better HSQ outcomes (p=.006), but

adherence did not correlate with ABC-H scores. No candidate variables were found to moderate the relationship between parent training and HSQ or ABC-H outcomes, which may suggest that parent training is appropriate for the broader range of children with ASD.

Adaptive Behavior

Studies reported mixed findings related to outcomes associated with baseline adaptive behavior. In one retrospective cohort, positive outcomes in both the early intervention and the waitlist control groups were related to higher baseline adaptive scores.[86] In one early intervention study, initial higher adaptive behaviors predicted better post-treatment early language comprehension.[101, 102] In an RCT comparing risperidone alone and risperidone plus parent training, treatment gains were not associated with adaptive or maladaptive behaviors.[167, 179-181]

Language/Communication

The impact of language skills and attention to objects (vs. people) were assessed in three studies. In one RCT of the More Than Words program, the treatment group showed differential effects on child communication depending on children's baseline object interest; children with lower levels of baseline object interest had greater growth in communication skills, whereas children with higher levels of object interest showed attenuated growth.[93] In another study of play-focused intervention, children with baseline expressive language abilities below 11.3 months showed greater gains in language in the intervention group vs. control (effect size=0.25 for 24 children with low language skills).[156] In another early intervention study, children who gained more language comprehension had higher adaptive behavior scores pre-treatment. Pre-treatment language comprehension also predicted post-treatment language production.[101, 102]

An RCT evaluating an imitation-based approach to affect social functioning[152, 153]assessed whether changes in social functioning were tied to changes in participants' imitation skills. Gains in imitation were associated with the number of spontaneous play acts at baseline; however, changes in imitation were not shown to be associated with gains in social functioning. This finding could be because the study had too few participants (n=27) to detect such an effect.

Other Factors

One RCT compared the effects of a 6-week joint attention or symbolic play intervention with a control arm in participants receiving 30 hours of early intervention; at the 5 year followup, investigators assessed diagnoses and language skills for 40 of the 58 original participants.[140, 141, 148, 149]Investigators also identified potential predictors of vocabulary and cognitive changes via regression analyses. Potential predictors included child age, sex, maternal education, play levels and types, and joint attention responses. Ability to use spoken language at followup ("passing" the language assessments) was predicted by children's average play level at baseline ($p<.01$). Number of functional play types at baseline predicted greater cognitive skills. Younger age at baseline, initiation of joint attention, play level and treatment group assignment (either joint attention or symbolic play) predicted subsequent vocabulary ability (all $p<.03$); these factors together explained 64 percent of spoken language variability. Importantly, this study is limited in that children were often receiving intensive levels of intervention outside of the intervention setting, making impact of prescribed intervention hard to determine.

Parent-Related Factors

Four early intervention studies assessed variables related to parents/caregivers. In one RCT incorporating parent training,[72, 105] parents in the additional treatment group showed increased responsiveness to their children during videotaped interactions, which was correlated with reduced ASD symptom severity (p=.049). No between-group differences were found in adaptive behavior or parenting stress. In another parent training RCT, parents in the professionally led group with low baseline self-efficacy reported higher followup self-efficacy levels than parents in the video arm.[100] In a report[87] also including a population reported in a retrospective cohort[86], parental stress was not associated with any outcomes. In both the early intensive intervention and eclectic treatment control group in one study, child outcomes on early language skills, mental developmental state, and adaptive behaviors were significantly influenced by self-reported parental stress, children's ability to respond correctly to prompts, the number and difficulty of treatment targets, and children's problem behaviors in sessions. Children who were perceived by their parents as more difficult demonstrated less improvementin ASD severity.[101, 102]

Two play/interaction-focused RCTs assessed parent responsiveness and adherence to the treatment approach on treatment effects. One study comparing an 8-week caregiver-delivered joint attention approach with a waitlist control assessed intensity of total hours of intervention (external to the study), investigator-rated quality of caregiver participation, and parent-rated adherence as predictors of outcomes at the 12-month followup.[150] Greater caregiver quality of involvement predicted increased joint engagement (p<.05) but not other play skills or engagement outcomes. Parent-rated adherence or competence did not predict changes in any outcome. Number of hours of other intervention similarly did not predict any outcomes.[150]

Another RCT compared a 12-week intervention targeting parental responsiveness to children's playtime communication compared with a control group that received some parental education about developmental and educational needs.[156] Investigators also explored relationships among maternal synchronization (responsiveness to child communications) and long-term (12 months post-intervention) child language outcomes. Maternal synchronization was moderated by baseline maternal insightfulness (p<.05) and synchronization was greater in those mothers rated as insightful compared with non-insightful (effect size=0.31, p<.05). The link between short-term gain in maternal synchronization and long-term language (12 months post-treatment) gains was not moderated by maternal insightfulness, nor did initial language skills moderate the link between gains in maternal synchronization after 12 weeks and long term gains in expressive language.[156]

Intervention-Related Factors

Several studies of early intensive behavioral and developmental approaches evaluated potential effects associated with characteristics of the interventions themselves. In an RCT evaluating the LEAP program (full training compared with training manuals only), the students of teachers rated as having better intervention fidelity showed better outcomes on all measures.[84] In other studies assessing ABA-based early intervention, where examined, total hours of intervention per week were not associated with cognitive or adaptive outcomes, although hours were similar across intervention groups within each study (e.g., comparing half-day programs to other half-day programs).[76-78, 81-83] In a retrospective cohort study,[86] outcomes were related to age at enrollment, treatment duration, and higher baseline adaptive scores, with duration becoming nonsignificant after accounting for group membership (correlation of duration, group=.57,

p<.01). A significant interaction emerged between age at enrollment and group membership, with younger starting age influencing outcomes for the treatment group but not control.[86]

In a study comparing 1:1 home-based ABA early intervention (both university-provided and privately-provided) to community-based treatment-as-usual, IQ remained stable for children in the community-based group and significantly declined for children who received university-provided ABA intervention (effect size=.49). This result is confounded by nonrandom assignment and the fact that at baseline, the university-based group had higher levels of ASD symptoms, lower levels of adaptive behavior, and fewer total intervention hours.[79, 80] Finally, in a prospective cohort study, hours of intervention did not correlate with outcomes.[77]

KQ3. Treatment Phase Changes That Predict Outcomes

No studies were identified that provided data on changes early in treatment that predicted outcomes.

KQ4. Treatment Effects That Predict Long-Term Outcomes

Few studies assess end-of-treatment effects that may predict long-term outcomes. Several early intensive behavioral and developmental interventions change measures over the course of very lengthy treatments, but such outcomes usually have not been assessed beyond treatment windows. One family of studies[140, 141, 148, 149] attempted to follow young children receiving early joint attention intervention until they were school-aged, but it failed to include adequate followup of the control group. It also involved children who were receiving many hours of uncontrolled interventions during the course of study.

KQ5. Generalization of Treatment Effects

Key Points

- Some studies of imitation and joint attention reported generalization of skills, setting, and individual/provider from the treatment context to a novel context.

Overview of the Literature

Twelve studies (reported in multiple publications) reporting on different interventions measured generalization of effects seen in treatment. However, several studies incorporated parent- or teacher-delivered components, which may promote generalization of skills to the home and classroom.[93, 101-104, 126, 129, 151-153, 155, 157, 158, 161, 166, 178, 196]

Detailed Analysis

Few studies measured generalization of effects seen in treatment; however, several studies incorporated parent- or teacher-delivered components, which may promote generalization of skills to the home and classroom. Among play/interaction-focused studies, one study of imitation training reported that gains in elicited imitation skills in the treatment group were also reflected in improvements in motor imitation skills, suggesting transfer of skills learned in the intervention.[152, 153] In a prospective cohort study assessing an intervention targeting pretend play, treatment group participants maintained their level of play dialog with novel toys when scripted dialog (a component of the initial intervention) was not provided.[161] Four interventions targeting

joint attention skills based in preschools reported generalization: in one, increases in joint attention initiations with preschool teachers generalized to longer duration of joint engagement with mothers (10% increase from baseline compared with 2% decrease for control group).[155] Time jointly engaged with preschool teachers, however, did not increase. Two other studies[151, 157] suggested that joint attention skills training transferred to the classroom with treatment group participants spending less unengaged time and/or initiating more gestures. In a final study, children receiving either a joint attention or symbolic play interventions were able to generalize increases in responding to joint attention to a novel individual.[158]

Studies of early intervention approaches reported greater socially engaged imitation that generalized across settings and context in the treatment group,[103, 104] increased frequency of joint attention acts with an unfamiliar examiner,[93] and maintenance of skills over time and in the home and center-based setting.[101, 102] One study of a social skills intervention reported increases in participant social skills on intervention staff-rated but not parent-rated measures for either a Skillstreaming group or comparison group receiving a sociodramatic relational intervention.[129] In another social skills study, parents of children in a program enhanced for children with high functioning ASD reported improvements in their children's skills in various settings while parents of children in a traditional social skills group did not.[126] Finally, an analysis of Vineland and parental intrusiveness scores across income categories revealed no significant differences in one study of CBT, suggesting that the intervention is applicable across income levels.[166, 178, 196]

KQ6. Treatment Components That Drive Outcomes

We did not identify any studies meeting our inclusion criteria that addressed this question.

KQ7. Treatment Approaches for Children Under Age 2 at Risk for Diagnosis of ASD

Key Points

- Mean ages in studies identified were all under three years, and all studies address interventions that can be used with children under age 2
- Studies reported improvements in young children regardless of type of behavioral intervention

Overview of the Literature

This section presents the results of our literature search and findings regarding the use of treatment approaches in younger children who are at high risk of developing ASD based upon behavioral, medical, or genetic risk factors. In our 2011 review we identified two comparative studies (one good quality RCT[73] and one fair quality nonrandomized clinical trial[74]) addressing interventions for very young children. For the current review, we identified three studies[93, 97, 99] addressing treatment approaches for very young children. One crossover RCT was conducted in China (poor quality),[99] one prospective cohort study in Europe (poor quality),[97] and one RCT in the United States (fair quality).[93]

The mean age in most studies exceeded 24 months, although one[93] included children under age two. Mean ages were all under three years, and all studies address interventions that can be used with children under age 2. The average age for diagnosis of ASD in the United States is not until at least age 3, but a reliable diagnosis can be made as early as age 2.

One fair quality RCT was completed in the clinic and home settings.[93] Two poor quality studies, one crossover RCT and one prospective cohort study,[97, 99] included groups receiving in-home parent training.

Detailed Analysis

A fair quality RCT focused on enhancing parental responsivity and child communication.[93] It compared Hanen's More Than Words intervention to treatment-as-usual. The treatment group (n=29, mean age=21.11±2.71 months) received eight manualized group sessions with parents only and three in-home individualized parent-child sessions over a span of 3.5 months, whereas the control group (n=26, mean age=21.61±2.82 months) received no treatment or treatment as usual. There was no treatment effect on parental responsivity. The treatment group showed differential improvement on child communication depending on children's baseline object interest; children with lower levels of baseline object interest had greater growth in communication skills, whereas children with higher levels of object interest showed attenuated growth. Two poor quality studies compared parent training to lower intensity supportive interventions. Mean ages ranged from 25.33 to33.6 months. Both involved home visits and working with children and parents. The lower intensity treatment model, Autism-1-2-3, compared two groups that received the same series of ten thirty-minute child- and parent-training sessions, with one group having a lagged start date and serving as a control. It did not yield group differences on ASD symptoms, language skills, or parent stress scores.[99] The higher intensity model, Keyhole, incorporated elements of Hanen's More than Words and the TEACCH programs.[97] It compared 15-18 home visits over a 9 month period (n=35) targeting adaptive skills, ASD symptoms, and parent stress to a lower-intensity intervention model (n=26; 5 home visits, no additional services of supports). Compared with the control group, children in the treatment group showed improved adaptive, imitation, and communication skills, based only upon parent report. Mothers in the treatment group also reported improved health but did not report decreases in parenting stress.

In summary, young children who received behavioral interventions seemed to improve regardless of intervention type. It is important to note that none of the fair or better quality studies of young children compared children getting treatment to a no treatment control group. One poor quality study reported positive effects of treatment,[97] but the level of intervention intensity varied significantly between groups, and it is unclear whether the effects were due to intensity versus the treatment type. Potential modifiers of treatment efficacy include baseline levels of object interest.[93] Most outcome measures of adaptive functioning were based upon parent report, and the effect of parental perception of treatment efficacy on perception of child functioning was generally not explored.

Discussion

In this chapter, we summarize our findings about behavioral interventions for children with autism spectrum disorder (ASD). We provide an overview of the state of the literature by intervention type, detail the strength of evidence for the impact of each major intervention on relevant outcomes, and describe major issues and gaps in the current body of evidence.

Assessing the literature requires consideration of two main components, namely the observed effectiveness of interventions and our confidence that those effects will remain stable in the face of future research. Our confidence that the observed effect is the true effect and that perceived effectiveness is unlikely to change with future research is presented as strength of evidence, and can be insufficient, low, moderate or high. Strength of evidence describes the adequacy of the current research, both quantity and quality, and whether the entire body of current research provides a consistent and precise estimate of effect.

Methods for applying strength of evidence assessments are established in the Evidence-based Practice Centers' "Methods Guide for Effectiveness and Comparative Effectiveness Reviews"[55] and are based on consideration of five domains: study limitations, consistency in direction of the effect, directness in measuring intended outcomes, precision of effect, and reporting bias. We considered comparative studies—both RCTs and prospective and retrospective cohort studies—from the prior 2011 review plus the studies identified for the current review in determining strength of the evidence for major outcomes.

We required at least three fair studies to be available to assign a low strength of evidence rather than considering it to be insufficient. We required at least one good study for moderate strength of evidence and two good studies for high strength of evidence. In addition, to be considered "moderate" or higher, intervention-outcome pairs needed a positive response on two out of the three domains other than study limitations.

Once we established the maximum strength of evidence possible based upon these criteria, we assessed the number of studies and range of study designs for a given intervention-outcome pair, and downgraded the strength of evidence rating when the cumulative evidence was not sufficient to justify the higher rating.

Key Findings and Strength of Evidence

KQ1. Effects of Behavioral Interventions on Core and Commonly Associated Symptoms in Children With ASD

Early Intensive Behavioral and Developmental Interventions

Within this category, we included intensive behavioral and developmental interventions derived from applied behavior analysis (ABA) principles that targeted a broad range of skills and vulnerabilities. As such, this category includes defined manualized approaches that vary substantially in terms of their structure, approach and setting (e.g., University of California, Los Angeles [UCLA]/Lovaas, Early Start Denver Model [ESDM], Learning Experiences and Alternate Program for Preschoolers and their Parents [LEAP]) as well as more eclectically defined and delivered approaches. ABA is an umbrella term describing principles and techniques used in the assessment, treatment and prevention of challenging behaviors and the promotion of new desired behaviors. The goal of ABA is to teach new skills, promote generalization of these

skills, and reduce challenging behaviors with systematic reinforcement. The principles and techniques of ABA existed for decades prior to specific application and study within ASD.

An additional set of interventions included here uses the principles of ABA to focus on key pivotal behaviors rather than global improvements. These approaches emphasize parent training (e.g., Pivotal Response Training, Hanen More than Words, social pragmatic intervention, etc.) and may focus on core social-communication skills or specific behaviors, such as initiating activities.

In the 2011 review, we identified 17 comparative studies of early intensive behavioral and developmental intervention[57-75] (described in 19 papers), of which six were RCTs (two good quality,[73, 75] four fair[57, 69, 71, 72]), five were nonrandomized trials (four fair quality,[64-68, 74] one poor[70]), four were prospective cohort studies (three fair[60, 61, 63] and one poor quality[62]), and two were poor quality retrospective cohort studies.[58, 59] We located 37 papers comprising 25 unique studies addressing early intensive behavioral and developmental interventions for this review update. Individual studies using intensive UCLA/Lovaas-based interventions, ESDM, the LEAP program, and eclectic variants reported improvements in outcomes for young children. Our strength of the evidence assessment considers studies from both the 2011 and current reviews.

Improvements were most often seen in cognitive abilities and language acquisition with less robust and consistent improvements seen in adaptive skills, core ASD symptom severity, and social functioning. Young children receiving high intensity ABA-based interventions over the course of extended time frames (i.e., 8 months--2 years) commonly display substantial improvement in cognitive functioning and language skills relative to community controls. However, the magnitude of these effects varies across studies and this variation may describe subgroups showing different responses to particular interventions. Intervention response is likely moderated by both treatment and child factors, but exactly how these moderators function is not entirely clear. Despite multiple studies of early intensive treatments, intervention approaches still vary substantially, which makes it difficult to tease apart what these unique treatment and child factors may be. Sample sizes of studies in the current review are typically small (total Ns ranging from 11-284, median=40), and some studies may be considered pilots for larger studies that may better elucidate questions about interventions intensity and moderators of effects. Further, the long-term impact of these early skill improvements is not yet clear, and many studies did not follow children beyond late preschool or early school years.

Studies of high intensity early intervention services also demonstrated improvements in children's early adaptive behavior skills, but these improvements are more variable than those found for early cognitive and language skills. Treatment effects are not consistently maintained across studies. Many studies measure different adaptive behavior domains (which creates within scale variability) and some evidence suggests that adaptive behavior changes may be contingent upon baseline child characteristics, such as cognitive/language and ASD severity.

Evidence for the impact of early intensive intervention on core ASD symptoms is more limited and mixed than its impact on cognitive and adaptive behavior skills. Children's symptom severity often decreased during treatment, but these improvements did not often differ from those of children in control groups. In fact, almost equal numbers of studies report treatment impact versus null treatment effects.

Since our previous review, there have been substantially more studies of well-controlled low intensity interventions that provide parent training in bolstering social communication skills. This growing literature base provides increasing data about the utility of such interventions for younger children with ASD, particularly when targeting social communication and language use.

However, although parent training programs reported that parenting behaviors were modified during interactions, data are more limited about improvement in broad developmental skills (such as cognition, adaptive behavior, and ASD symptom severity) beyond language gains for some children. Children receiving low-intensity interventions have not demonstrated the same substantial gains as seen in the early intensive intervention paradigms regarding cognitive and adaptive skills.

Strength of the Evidence

A growing evidence base suggests that some children receiving early intensive behavioral and developmental interventions (e.g., many hours of intervention a week over the course of 1–2 years) show substantial improvements in cognitive and language skills over time compared with children receiving low-intensity interventions, community controls, and eclectic non-ABA based intervention approaches. With this growing literature, our confidence (strength of evidence) in the effects of ABA-based early intensive approaches on cognitive and language outcomes is moderate, based on the need for additional research that identifies which groups of children benefit the most from specific high intensity approaches. Our strength of evidence in these high intensity interventions to affect adaptive behavior skills, social skills, and core ASD symptom severity is low. At present it is challenging to understand which approaches to high intensity intervention have the greatest effects for specific children (Table 12).

The strength of the evidence for parent training interventions is low for a positive effect of their impact on early language and communication skills and low for a positive impact on ASD symptom severity. The strength of the evidence is low for no effect on early cognition. Data are not yet sufficient in this literature base to understand impact on adaptive behavior skills. Available studies indicate variable responses, with modest improvement for some children in some approaches, but limited improvement in other parent training paradigms (Table 13).

Table 12. Strength of evidence for ABA-based early intensive behavioral and developmental studies

Outcome Strength of Evidence Grade	Study Design Quality and Number of Studies (N Total Participants)	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Finding
IQ/cognitive **Moderate for positive effect**	RCT: 1 good, 2 fair (360) Prospective cohort: 6 fair, 2 poor (521) nRCT; 1 good, 4 fair (170) Retrospective cohort: 1 fair, 2 poor (182)	Medium	Consistent	Direct	Precise	Undetected	Young children receiving high intensity interventions display improvements in aspects of cognitive functioning. Most studies found that children in treatment and comparison groups both improved on cognitive skills, with children in high intensity early intensive intervention improving more than children receiving other types of services. Not all of these improvements were maintained at long-term followups. Many children display a positive response to this intervention, but the effect is somewhat variable across studies and may be indicative of subgroups with variable response. Across studies where positive effects were seen, the actual treatment impact on skills may vary based on child and intervention factors. A key limitation is that approaches across studies vary substantially, and it is hard to determine the effects of these unique studies on specific groups of children.

Table 12. Strength of evidence for ABA-based early intensive behavioral and developmental studies (continued)

Outcome Strength of Evidence Grade	Study Design Quality and Number of Studies (N Total Participants)	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Finding
Adaptive behavior **Low for positive effect**	RCT: 1 good, 1 fair (76) Prospective cohort: 7 fair, 2 poor (616) nRCT: 1 good, 4 fair (170) Retrospective cohort: 1 fair, 2 poor (182)	Medium	Inconsistent	Direct	Imprecise	Undetected	Most studies found that children in both treatment and control groups improved on adaptive skills. However, children in high intensity early intensive intervention improved more than children receiving other types of services. Not all group differences were maintained over long-term followup. There was variability within domains, such that some studies found improvement whereas others found declines in domain standard scores. For example, one study found a decrease in the motor skills domain for both treatment and control groups. An important limitation is that adaptive behavior was always measured by parent report (Vineland) rather than objective observation. Some studies suggested that adaptive behavior outcomes were dependent on baseline child characteristics, such as cognitive and verbal abilities and ASD severity.

Table 12. Strength of evidence for ABA-based early intensive behavioral and developmental studies (continued)

Outcome Strength of Evidence Grade	Study Design Quality and Number of Studies (N Total Participants)	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Finding
Symptom severity **Low for positive effect**	RCT: 1 good, 1 fair (332) nRCT: 1 good, 1 fair (74) Prospective cohort: 4 fair, 2 poor (470) Retrospective cohort: 1 fair (142)	Medium	Inconsistent	Direct	Imprecise	Undetected	Mixed impact on symptom severity; SOE is low for a positive effect on symptom severity because 2 good studies showed positive effects but multiple lower quality studies did not. More studies are needed to confirm results. Most control groups were also receiving treatment and also showed improvement, making it difficult to tease apart the effect of early intensive intervention specifically vs. any kind of intervention. Evidence emerged that baseline symptom severity predicts response to treatment, although the direction is inconsistent.
Language/ commun-ication **Moderate for positive effect**	RCT: 1 good, 2 fair (360) nRCT: 1 good, 3 fair (143) Prospective cohort: 6 fair, 2 poor (616)	Medium	Consistent	Direct	Precise	Undetected	Most studies found a positive effect of treatment on language/communication skills, although the specific domain of improvement (e.g., receptive vs. expressive language) varied across study. Some initial between-group differences disappeared at long-term followup. Some evidence that baseline child factors such as gender and cognitive skills influenced effects of treatment on language outcomes. A limitation is that some studies measured language using direct testing, whereas others only used the Vineland Communication domain.

Table 12. Strength of evidence for ABA-based early intensive behavioral and developmental studies (continued)

Outcome Strength of Evidence Grade	Study Design Quality and Number of Studies (N Total Participants)	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Finding
Social skills/social behavior **Low for positive effect**	RCT: 1 good, 1 fair (332) nRCT: 1 fair (34) Prospective cohort: 4 fair, 1 poor (406) Retrospective cohort: 1 fair (142)	Medium	Inconsistent	Direct	Imprecise	Undetected	Many studies found that treatment groups improved more than controls on measures of social skills, although a significant minority did not find any treatment effect. A significant limitation is that social skills were assessed almost exclusively using parent-reported standard scores on the Vineland.

ABA-applied behavior analysis; nRCT-nonrandomized controlled trial; RCT-randomized controlled trial

Table 13. Strength of the evidence for early intervention-parent training studies

Outcome Strength of Evidence Grade	Study Design Quality and Number of Studies (N Total Participants)	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Finding
IQ/cognitive **Low for no effect**	RCT: 3 fair (148) Prospective cohort: 1 good, 1 fair, 1 poor (142)	Medium	Inconsistent	Direct	Imprecise	Undetected	Most studies of parent-implemented ABA demonstrated no improvements in IQ relative to community-based interventions; in some studies worse outcomes were reported relative to center-based treatment. SOE is low for no effect due to heterogeneity in interventions and outcomes measured.

Table 13. Strength of the evidence for early intervention-parent training studies (continued)

Outcome Strength of Evidence Grade	Study Design Quality and Number of Studies (N Total Participants)	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Finding
Symptom severity **Low for positive effect**	RCT: 3 good, 3 fair (361) Prospective cohort: 1 good, 1 fair, 2 poor, (203)	Low	Inconsistent	Direct	Imprecise	Undetected	Many studies found that treatment groups had improved ASD symptoms relative to controls. However, a significant limitation is that the measure of symptom severity varied across studies and was inconsistently defined, from videotaped behavioral observations to standardized parent report forms like the GARS to interactive assessments like the ADOS. This makes it difficult to meaningfully compare outcomes across studies.
Language/ commun-ication **Low for positive effect**	RCT: 4 good, 6 fair, 1 poor (664) nRCT: 1 poor (22) Prospective cohort: 2 good, 2 poor (176)	Low	Inconsistent	Direct	Precise	Undetected	Parent training was associated with improvements in language (low SOE for improvements), but interventions and comparators were different across studies, as were the outcome measures. More studies are needed to confirm results. Of studies that assessed language outcomes, two possible child variables influencing treatment efficacy emerged. The first is that younger child age was associated with greater language improvements at followup in two studies. Second, another study found that higher baseline levels of object interest in children were associated with attenuated growth in communication skills.

ADOS = Autism Diagnostic Observation Schedule; GARS = Gilliam Autism Rating Scale; nRCT = nonrandomized controlled trial; RCT = randomized controlled trial

Social Skills Studies

In addition to the nine comparative studies assessing social skills included in the 2011 review (eight RCTs of fair[114-116] and poor[117-121] quality and one poor quality retrospective cohort[122]),we located 13 studies addressing interventions targeting social skills for this review update. The overall quality of studies improved compared with the previous review with two good quality and 10 fair quality studies, and one of poor quality. Social skills interventions varied widely in terms of scope and intensity. A few studies replicated interventions using the manualized Skillstreaming model; one reported longer term results from research on the Children's Friendship Training model. Other studies incorporated peer-mediated and/or group-based approaches, and still others described interventions that focused on emotion identification and theory of mind training. The studies also varied in intensity, with most interventions consisting of 1-2 hour sessions/week lasting for approximately 4-5 weeks. However, some of the group-based approaches lasted for 15-16 weeks.

Most studies reported some short term gains in either parent-rated social skills or directly tested emotion recognition. However, our confidence (strength of evidence) in that effect is low. While we now have higher quality investigations of social skills interventions demonstrating positive effects, our ability to determine the effectiveness of these interventions continues to be limited by the diversity of the intervention protocols and measurement tools (i.e., no consistent outcome measures used across studies). Maintenance and generalization of these skills beyond the intervention setting is also inconsistent, with parent- and clinician-raters noting variability in performance across settings. No studies reported harms of intervention.

Strength of the Evidence

The strength of evidence for the effect of social skills interventions on social outcomes for school aged children with ASD is low. All studies demonstrated benefit on at least one outcome measure, but a lack of consistency in the interventions or measures used makes it difficult to assess consistency or precision. Most studies relied on parent or teacher report of intermediate outcomes, although some studies have attempted to included ratings and outcomes (peer/teacher nominations, social networks/maps) with potential for assessment of generalization (Table 14).

Table 14. Strength of the evidence for social skills studies

Outcome Strength of Evidence Grade	Study Design Quality and Number of Studies (N Total Participants)	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Finding
Social skills/social behavior **Low for positive effect**	RCT: 2 good, 11 fair, 6 poor (730) nRCT: 2 fair (45) Retrospective cohort: 1 poor (117)	Medium	Inconsistent	Direct	Precise	Undetected	School-aged children diagnosed without concomitant cognitive and language deficits demonstrated short-term gains in social skills and emotion recognition. Maintenance and generalization of these skills beyond the treatment context had variable results. Social skills interventions varied widely in terms of scope and intensity.

nRCT = nonrandomized controlled trial; RCT = randomized controlled trial

Play- /Interaction-Focused Studies

Studies incorporating play or interaction-based elements have targeted either joint attention skills, early imitation skills, or focused play in younger children. No studies reported harms of intervention. Since our previous review, which included seven (reported in nine publications) comparative studies (two RCTs of fair[139-141] and five of poor[142-147] quality) addressing play- or interaction-based approaches, there have been substantially more studies of well-controlled joint attention interventions across a range of intervention settings (e.g., clinician, parent, teacher delivered). Regarding joint attention skills, interventions were delivered by parents, teachers, and interventionists over typically short durations (≤ 12 weeks). Three studies reported longer-term followup (≥12 months).[140, 141, 148-150, 156]As with other studies reported in this review, participants in play/interaction studies often received other early intervention services in addition to the targeted intervention, making disentangling effects of the intervention difficult.
This growing evidence base supports positive effects for young and preschool children with ASD, particularly when targeting joint attention skills themselves as well as related social communication and language skills. Although joint attention intervention studies certainly demonstrated changes within this theoretically important domain, data are more limited about their ability to improve broad developmental skills (such as cognition, adaptive behavior, and ASD symptom severity) beyond communication and language gains over time.

Specific and focal training regarding imitation skills utilizing naturalistic approaches to promote imitation (i.e., Reciprocal Imitation Training) has shown positive results in improving not only imitation skills, but potentially other social communication skills such as joint attention as well.[152, 153] Additionally, parent training in a variety of play-based interventions is associated with positive outcomes for encouraging early social communication skills (e.g., joint attention, engagement, play interactions), play skills, and early language skills.[154, 156, 160]

Strength of the Evidence

A growing evidence base reports on effects in children receiving early joint attention-related intervention in combination with other interventions show substantial improvements in joint attention and language skills over time. Within this growing literature, our confidence (strength of evidence) in this effect is moderate, based on the need for additional research that identifies which groups of children benefit the most from this approach and how this intervention relates to other ongoing concurrent offered interventions. Results from a variety of play-based interventions also suggest that young children often display short-term improvements in early play, imitation, language, and social interaction skills. However, our confidence in these estimates is low, and substantial evidence that these short-term improvements are linked to broader indices of change over time is lacking (Table 15).

Table 15. Strength of the evidence for play/interaction-based studies

Outcome Strength of Evidence Grade	Study Design Quality and Number of Studies (N Total Participants)	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Finding
Joint attention **Moderate for positive effect**	RCT: 3 good, 6 fair (305)	Low	Consistent	Indirect	Precise	Undetected	Selected joint attention skills consistently increased in treatment arms, but duration of effects is unclear. The SOE is lowered to moderate as children in most studies were also receiving other early intervention and disentangling effects is difficult.
Play skills **Low for positive effect**	RCT: 3 good, 3 fair, 3 poor (265) Prospective cohort: 1 poor (12)	Medium	Consistent	Direct	Precise	Undetected	Play skills increased in treatment arms but duration of effects is unclear. Imitation skills improved in treatment arms in 4 small, short-term studies and in the treatment and control arms in 1 study.
Language/ Commun-ication **Low for positive effect**	RCT: 4 fair (165)	Medium	Consistent	Direct	Imprecise	Undetected	Expressive but not receptive language skills generally increased in the treatment arms in 2 studies; expressive and receptive language improved in 1 study; prompted but not spontaneous communication improved in 1 study.
Social skills **Low for positive effect**	RCT: 1 good, 3 fair (173)	Medium	Consistent	Indirect	Precise	Undetected	Joint engagement or positive affect improved in treatment arms in 3 studies.

RCT = randomized controlled trial

Interventions Targeting Conditions Commonly Associated With ASD

Most studies in this category evaluated the impact of cognitive behavioral therapy (CBT) on co-occurring conditions, such as problem behaviors or anxiety, rather than core ASD symptoms or broader developmental domains (e.g., cognition, language, adaptive behavior). We identified nine comparative studies addressing interventions targeting conditions/behaviors commonly associated with ASD in the 2011 review. These studies included four RCTs[163-167] and one nonrandomized trial[168] of fair quality and three RCTs[169-171] and one prospective cohort[172] of poor quality.

Seven of nine RCTs identified for the current and 2011 review measured anxiety symptoms as a primary outcome.[164-166, 169, 171, 173, 174, 176-178, 182] Six of these studies reported significantly greater improvements in anxiety symptoms in the intervention group compared with controls. Two of these studies found positive effects of CBT on the core ASD symptom of socialization. The one RCT that did not find a significant benefit of CBT compared it to social recreational therapy rather than treatment as usual or a waitlisted control group. Although the CBT group had improved anxiety symptoms, this improvement did not significantly differ from participants receiving social recreational therapy.[174]

The studies examining the effects of CBT on anxiety had largely consistent methodologies and primarily conducted weekly 60-90 minute treatment sessions over a period of 4 months. All studies provided followup data reflecting treatment effects that lasted beyond the period of direct intervention. Two common factors limit the applicability of the results, however. Due to the nature of CBT, which is often language-intensive and requires a certain level of reasoning skills to make abstract connections between concepts, most studies included only children with IQs much greater than 70. This likely restricts the applicability of findings to the general population of people with ASD. Additionally, the CBT interventions described in these studies included both children and parents, suggesting that both components may be necessary for effective treatment.

These studies are encouraging regarding the use of CBT to treat anxiety in children with ASD. They also suggest that CBT could potentially be associated with improvements in socialization and communication, although these results were less robust and it is unclear if these improvements were beyond improvements related to the impact of ameliorated anxiety itself.

Additional data in the current review relate to parent training to address challenging behavior. Specifically, one fair quality study combined a parent training approach with risperidone. This combination significantly reduced irritability, stereotypic behaviors, and hyperactivity, and improved socialization and communication skills. However, these effects were not maintained at one-year post-treatment. The followup sample size also decreased from 124 to 87.[167, 179-181, 184]

Strength of the Evidence

A growing evidence base suggests that school-aged children with average to above average intelligence and comorbid anxiety symptoms receiving manualized CBT therapy show substantial improvements in anxiety compared with wait-list controls. Within this population our confidence (strength of evidence) in this effect is high. Our strength of evidence of the impact of this intervention for this same group on ASD symptoms (social communication functioning and repetitive behaviors) is low with future research likely affecting our understanding of the unique impact of this intervention (Table 16). With regard to parent training paradigms to address challenging behavior, results of parent training studies and parent training in addition to

treatment with risperidone have demonstrated short-term improvements in terms of the frequency and intensity of challenging behavior. With few higher quality studies in this area, we considered the strength of the evidence to be insufficient (Table 17).

Table 16. Strength of the evidence for studies addressing interventions targeting commonly associated conditions

Intervention/ Outcome Strength of Evidence Grade	Study Design Quality and Number of Studies (N Total Participants)	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Finding
CBT							
Anxiety **High for positive effect in older children with IQ ≥70**	RCT: 6 good, 1 fair, 2 poor (413) nRCT: 1 fair (31)	Low	Consistent	Direct	Precise	Undetected	Most studies included older children with average IQs. Improvement in anxiety symptoms for greater for CBT vs. control group in 5/6 studies. The study that did not show improvement compared CBT to an active treatment instead of a waitlisted control. Improvement was maintained at followup. Some evidence emerged that CBT may be more effective for some types of anxiety disorders than others.
Symptom severity **Low for positive effect**	RCT: 2 good (81)	Low	Consistent	Direct	Imprecise	Undetected	Significant improvement in clinician- and parent-rated measures of anxiety severity in both studies with improvement maintained at followup. SOE is low based on only 2 small studies.

CBT = cognitive behavioral therapy; nRCT = nonrandomized controlled trial; RCT = randomized controlled trial

Other Behavioral Studies

In addition to two poor quality RCTs targeting neurofeedback[186, 187] and described fully in the 2011 review, we identified we identified six new studies (seven publications) evaluating interventions targeting sleep behaviors,[188-190] feeding difficulties in ASD,[191] and neurofeedback.[192-194] The neurofeedback RCTs reported some improvements on parent-rated measures of communication and tests of executive function. The clinical implications of changes in brainwave patterns reported in the studies are unclear, and the studies were small and short-term.[192, 194, 195] Three studies reported on sleep-focused interventions, with little positive effect of a sleep education pamphlet for parents in one,[188] improvements in sleep quality in treatment arms (melatonin alone, melatonin+CBT) in another,[189] and some improvements in time to fall asleep in one short terms RCT of sleep education programs for parents.[190] One poor quality study of parent education to mitigate feeding problems reported no significant effects.[191]

Strength of the Evidence

With few studies of additional behavioral interventions, all of limited quality, evidence was insufficient to evaluate the relative effect of other behavioral interventions on targeted outcomes including ASD symptom severity, problem behaviors, and sleep concerns as well as outcomes for Key Question 7 (interventions for very young children at risk for ASD diagnosis). Table 17 outlines interventions/outcomes for which we considered the strength of the evidence to be insufficient.

Table 17. Behavioral interventions/outcomes with insufficient strength of evidence

Intervention	Anger	Adaptive Behavior	Challenging Behavior	Executive Function	Feeding Behaviors	Language/ Communication	Outcomes for children age 0-2 yrs at risk for ASD diagnosis	Repetitive Behavior	Symptom Severity	Sleep Parameters	Social Skills
ABA-based early intensive behavioral and developmental interventions							✓				
CBT (commonly associated conditions)	✓	✓		✓							
CBT(other behavioral interventions)										✓	
Neurofeedback (other behavioral interventions)				✓		✓					✓
Parent training (commonly associated conditions)		✓	✓						✓		
Parent training targeting feeding behaviors (other behavioral interventions)					✓						
Play/interaction-based interventions			✓								
Sleep education pamphlet (other behavioral interventions)										✓	
Social skills						✓		✓	✓		

ABA = applied behavior analysis; ASD = autism spectrum disorder; CBT = cognitive behavioral therapy; yrs = years

Note: Checked outcome/intervention pairs=insufficient strength of evidence.

KQ2. Modifiers of Treatment Effects

Understanding the degree to which child characteristics (i.e., specific ASD-related difficulties and skills), treatment factors (e.g., type, duration, intensity), and systems (e.g., family, community) influence response to intervention could help professionals target treatments to the appropriate children and circumstances. However, as was reported in the 2011 review, few studies were clearly designed or powered to allow for analysis of heterogeneous effects. Primarily studies in this section are those in which potential correlates were identified that may be moderators, but have not been studied as such. These potential moderators should be assessed in properly designed and powered studies for this purpose.

Among early intensive ABA-based interventions potential modifiers or moderators, younger age at intake was generally associated with better outcomes for children; however, this finding was not present in some other studies.[123, 167, 179-181] Higher cognitive skills and higher adaptive behavior scores at baseline also were often associated with better outcomes across behavioral interventions, but the associations were not consistent. In general, children with lower symptom severity or less severe diagnoses improved more than participants with greater impairments. However, many studies (e.g., those of social skills, CBT) often restricted the range of participants' impairment at baseline, limiting understanding of intervention impact on broader populations. Studies assessing parental responsiveness to children's communication typically reported better outcomes in children whose parents were more aligned with the child's communication versus those who attempted to re-direct or were less synchronized with it.

Regarding intervention-related factors, duration of treatment had an inconsistent effect, with some studies reporting improved outcomes with greater intervention time and others reporting no association. Studies have often not been adequately designed or controlled in order to help identify true moderators of treatment. More often post-hoc evaluation of differences across groups has been examined.

KQ3. Treatment Phase Changes That Predict Outcomes

The reviewed literature offers little information about what specific early changes from baseline measurements of child characteristics might predict long-term outcome and response. Some evidence suggests that the best predictor of long-term outcome is not baseline characteristics at all, but rather the magnitude of change seen over the course of treatment (e.g., cognitive shifts in first years of early intensive treatments).[73, 85]

KQ4. Treatment Effects That Predict Long-Term Outcomes

Few studies assess end-of-treatment effects that may predict outcomes. Several early intensive behavioral and developmental intervention paradigms change measures over the course of very lengthy treatments, but such outcomes usually have not been assessed beyond treatment windows. One family of studies[140, 141, 148, 149] attempted to follow young children receiving early joint attention intervention until they were school aged, but this study failed to include adequate followup of control conditions. It also involved children were receiving many hours of uncontrolled interventions during the course of study.

KQ5. Generalization of Treatment Effects

Few studies included in this review explicitly measured generalization of treatment effects to different conditions or locations. Often, early intensive behavioral and developmental interventions attempted to index change by examining standardized cognitive skills, adaptive behavior, and language measures in addition to metrics of ASD symptoms. Presumably, changes measured on these instruments document important skills with potential impact in other areas. However, some caution is warranted: In some instances, the interventions themselves may actually target component skills of these assessments, particularly in the case of cognitive and language assessments.

The majority of the social skills and behavioral intervention studies targeting associated conditions attempted to index outcomes based on parent, self, teacher, and peer report of targeted symptoms (e.g., anxiety, externalizing behaviors, social skills, peer relations) at home, at school, and in the community. While such ratings outside of the clinical setting may be suggestive of generalization in that they improve outcomes in the daily context/life of the child, in most cases, these outcomes are parent reported and not confirmed with direct observation. Behavioral intervention studies rarely measured outcomes beyond the intervention period, and therefore we cannot assume that effects are maintained over time.

KQ6. Treatment Components That Drive Outcomes

We again did not identify any studies meeting our inclusion criteria that addressed this question.

KQ7. Treatment Approaches for Children Under Age 2 at Risk for Diagnosis of ASD

In the studies addressing interventions for younger children,[93, 97, 99] children who received behavioral interventions seemed to improve regardless of intervention type. None of the fair or good quality studies compared treatment groups to a no treatment control group. One poor quality study found positive differential effects of treatment,[97] but the level of intervention intensity varied significantly between groups, making it difficult to differentiate the effects of treatment intensity vs. type. Potential modifiers of treatment efficacy include baseline levels of object interest.[93] Most outcome measures of adaptive functioning were based upon parent report, and the effect of parental perception of treatment efficacy on perception (and report) of child functioning was generally not explored.

Findings in Relation to What Is Already Known

Other reviewers have also synthesized the impact of early intensive behavioral interventions. We rated three meta-analyses evaluating early intervention for children with ASD that were published since the 2011 review as good quality.[45, 52, 197] We also summarize two overview meta-analyses (not quality rated) addressing early intervention.[198, 199] Findings of other reviews assessing effects of early intensive ABA-based intervention largely align with our evaluation of the strength of evidence. Specifically, other reviews have demonstrated consistent impact on cognitive and language skills with fairly large effect sizes across these somewhat overlapping syntheses. These same investigations have also noted much less consistent changes in adaptive behavior skills. Further, these reviews have highlighted similar methodological concerns as

noted in our current review: relatively small sample sizes, inclusion of nonrandomized studies, lack of standardized control groups, errors in interpretation of studies, and wide variations in the early intervention approaches assessed.

One Cochrane review compared early intervention to treatment as usual and included RCTs or controlled trials with participants under 6 years of age at intake.[45] The review included 5 studies (one RCT) with a total of 203 participants (mean age range: 30.2 to 42.5 months). The investigators rated all studies as having high risk of bias (low overall quality) and found positive effects for early intervention on all outcomes. Mean difference effect sizes were 0.76 for IQ (95% CI=0.40 to 1.11, p<.0001), 0.69 for adaptive behavior (95% CI=0.38 to 1.01, p<.0001) and ranged from 0.42 to 0.74 for measures of communication, socialization, and daily living skills (p values .0005 to .03). Tests of heterogeneity and small sample sizes precluded assessment of moderators of effects.

One meta-analysis of ABA-based interventions included studies with at least five children with ASD receiving at least 10 hours of intervention per week for 45 weeks. Twenty-two studies met criteria and assessed outcomes including IQ, receptive and expressive language, and adaptive behavior (Vineland composite and subscales). Studies included 323 patients (mean age 22.6 to 66.3 months, 55.6 to 97% male). Study quality was low to moderate, ranging from 1.2 to 3.6 on a five point scale (mean 2.5). Thirteen studies had control groups (six with random/quasi-random assignment). Positive effects were associated with ABA-based intervention in 18 studies assessing the outcome with a pooled effect size of 1.19 (95% CI: 0.91 to 1.47, p<.001). Similarly, ABA was associated with positive effects on language (general, expressive, and receptive, effect sizes from 1.07 to 1.48) and adaptive behavior (communication, socialization, motor skills, daily living skills domains as well as composite scores; pooled effect sizes ranging from 0.61 to 1.45). The effect size for the composite score was 1.09 (95% CI: 0.70 to 1.47, p<.001), and total treatment duration was associated with better adaptive behavior and language outcomes but not IQ. Results restricted to studies with control groups were consistent with results for all studies across outcomes. Across outcomes, effect sizes were generally slightly better for clinic-based approaches vs. parent-delivered. Similarly, the investigators note the potential for publication bias for the outcomes of IQ and language and the adaptive behavior domains of communication and socialization.[52]

Another meta-analysis of ABA-based early intervention included 11 small comparative studies (one RCT) with 344 children with ASD (mean age 33.56 to 65.68 months, 65.7% male).[197] The mean quality of studies as rated on the Downs and Black scale was 24.65 out of 32 (range 23-27). The early intervention group had greater gains on all variables assessed compared with control group participants, with full scale IQ improving by 11.98 points over improvements in the control group. Receptive and expressive language scores for the early intervention group compared with control each improved by more than 13 points, while improvements on Vineland subscales scores ranged from 4.96 to 10.44 points. Total effect sizes for daily living skills improvements were moderate (0.68) and were large for improvements in IQ, language, and adaptive behavior (effect sizes ranging from 0.91 to 2.00). The authors noted some evidence of publication bias. Table 18 outlines key characteristics of these early intervention meta-analyses.

A sequential or cumulative meta-analysis compiled data from 15 studies rated as adequate or high quality in five previously published meta-analyses (Eldevik 2009, Makrygianni 2010, Peters-Scheffer 2011, Reichow 2009, Spreckley 2009).[198] The 15 studies included 263 children with ASD. The sequential meta-analysis found a medium treatment benefit for early intervention vs. comparison interventions for the outcomes of intellectual functioning, language, and adaptive

behavior. The magnitude of treatment benefit varied for outcomes when assessing pre- to post-differences in the early intervention group. For IQ, the standardized mean difference effect size for group differences was 0.61 (p<.001) and the pre to post differences in the early intervention group was 0.71 (p<.01). Between group effect sizes for adaptive behavior and language were also considered medium (0.60 and 0.72, respectively, p values <.001). Pre to post effect sizes for adaptive behavior (0.35, p=ns) and language (0.69, p<.05) did not reach sufficiency and could not be considered as providing evidence of medium pre to post treatment benefit. The authors note that meta-analyses for pre to post differences in adaptive behavior and language were underpowered.

An overview of four of the same meta-analyses noted above plus one additional (Virues-Ortega 2010) described methodologic limitations across the meta-analyses.[199] Limitations included small sample sizes in included studies, inclusion of nonrandomized studies, lack of standardized control groups, errors in interpretation of studies, and variations in the early intervention approaches assessed. Four of the five meta-analyses concluded that early intervention was an effective approach. For IQ, the weighted mean effect size across meta-analyses ranged from 0.38 to 1.19 and from 0.30 to 1.09 for adaptive behavior. Despite the need for additional research, particularly in understanding effective treatment component and child characteristics associated with optimal outcomes, the authors conclude that early intervention can produce significant effects on IQ and adaptive behavior for many young children with ASD.

Table 18. Summary of meta-analyses of early intervention approaches

Author, Year	Study Type As Defined In Review (N) Total Participants/Group (N)	Mean Participant Age (Months)	Treatment Intensity, Hours/Week Treatment Duration, Mean Months (Range)	Effect Sizes (95% CI)
Reichow 2012[45]	RCT: 1 Controlled trial: 4 Early intervention: 116 Comparison: 87	30.2-42.5	>24 hours/week 26.3 months (14-36)	IQ: 0.76 (0.40 to 1.11) Expressive language: 0.50 (0.05 to 0.95) Receptive language: 0.57 (0.20 to 0.94) Vineland adaptive behavior: 0.69 (0.38 to 1.01) Vineland communication: 0.74 (0.30 to 1.18) Vineland socialization: 0.42 (0.11 to 0.73) Vineland daily living: 0.55 (0.24 to 0.87)
Virues-Ortega 2010[52]	Total studies (type not defined): 22 Early intervention: 323 Comparison: 180	22.6-66.3	12-45 hours/week 4-34 months	IQ: 1.19 (0.91 to 1.47) Expressive language: 1.47 (0.85 to 2.08) Receptive language: 1.48 (0.96 to 1.97) General language: 1.07 (0.34 to 1.79) Vineland adaptive behavior: 1.09 (0.70 to 1.47) Vineland socialization: 0.95 (0.53 to 1.37) Vineland communication: 1.45 (1.02 to 1.88) Vineland daily living: 0.62 (0.30 to 0.93) Vineland motor skills: 0.71 (0.19 to 1.22)
Peters-Scheffer 2011[197]	RCT: 1 Pre-test/post-test with control: 10 Early intervention: 168 Comparison: 144	33.65-65.68	12.5-38.6 hours/week 10-24+ months	IQ: 2.00 Non-verbal IQ: 0.98 Expressive language: 1.10 Receptive language: 2.91 Vineland adaptive behavior: 0.91 Vineland communication: 1.32 Vineland daily living: 0.68 Vineland socialization: 1.49

CI = confidence interval; IQ = intelligence quotient; n = number; RCT = randomized controlled trial

Applicability

ASD is characterized by significant heterogeneity within the population. Variation in both core and associated symptoms across and within children over time is substantial. Individual therapies are developed and tested to ameliorate specific symptoms or groups of symptoms, often in a fairly circumscribed subset of children. Ideally, research on therapies for ASD should target specific children most likely to benefit from a particular focus; thus details on the population, intervention, comparator, outcomes, and setting (PICOS) for each intervention category are provided in Appendix G. These data may help to support translation of our findings and assessment of the applicability of each for differing circumstances and children.

Furthermore, although interim, clinically based improvement is important, longer term functional outcomes are the goal for ASD interventions. In terms of followup for assessing durability of effects, most studies report on outcomes collected immediately post-treatment or within 3 months of treatment (roughly 75% of studies in the behavioral literature), although more studies than in our previous report attempt to assess impact over the course of much longer timespans. Additional research is needed on the degree to which changes observed during treatment translate to functional outcomes over time should treatment be discontinued. Importantly, ASD is often construed as a lifespan disorder and there has not yet been research assessing the long-term functional impact of treatment in childhood on lifespan development and functioning.

Studies of early intensive behavioral and developmental interventions were conducted primarily in preschool age and early school age children (i.e., typically children initially ages 1.5–7 years) and as such questions remain about how these approaches apply to and benefit younger children diagnosed with or at-risk for ASD. The cognitive, language, and adaptive behavior profiles of participants included in these studies were generally in line with those seen in the community (i.e., typically marked by substantial impairment/delay, but with some children with more intact early cognitive/language profiles). However, the availability and accessibility of the approaches studied are substantially limited in many community based settings. That is, the studies were often either conducted in highly controlled environments (e.g., university supported intervention trials) or the methodology was not well-described (i.e., non-manualized approaches). Thus, the generalizability (i.e., applicability) of these methods to common practice should be assessed carefully. Even available manualized interventions require high degrees of specialization and training that will likely continue to make translation into common practice difficult.

Studies of parent training interventions and play-based interventions for preschool children, often emphasizing principles of ABA aligned with current practice and the target populations that are typically referred for these services. Training programs often included components to improve social communication skills such as joint attention, play-based interactions, and pragmatic language approaches; interventions were conducted for approximately 1–4 hours/week with parents asked to introduce learned techniques within natural settings. Several programs offered manualized versions of training that can be adopted in other settings with appropriate training. Again the availability of providers capable of translating these programs may be limited in some community settings.

Most studies of social skills interventions targeted elementary school aged children (between 6 and 13 years old) with few studies targeting preschool age children, although such

interventions may be important in this younger age group. Most studies also excluded children with IQ falling outside of the average range and certainly those below 70. Therefore, evidence on social skills interventions is likely applicable to older, higher functioning children only. Similarly, CBT for commonly associated conditions was targeted toward older children with gross average cognitive abilities and comorbid anxiety disorders. The effectiveness of both of these types of interventions in other groups of children with ASD is currently unknown.

Implications for Clinical and Policy Decisionmaking

This review may be useful to groups producing guidelines for practice, including professional organizations, state-level Medicaid medical directors, Federal entities and insurers. It provides an overview of available behavioral interventions and benefits observed to date that clinicians may find useful in making individual clinical recommendations to their patients and patient families. The larger body of literature of higher quality than in the previous review provides continued support for earlier conclusions that behavioral interventions can be beneficial for some children. Guidelines developed on the basis of the prior review warrant updating based on the level of new information and the degree to which strength of evidence shifted in the current review.

The evidence in favor of the efficacy of several types of behavioral interventions has increased, but there remains clinical uncertainty about whether and how individual children will benefit from specific programs of intervention, which creates a challenge for implementation. Further, some interventions are limited in terms of the subset of the ASD population they are designed to treat (e.g., CBT and social skills interventions for older children with relatively intact cognitive abilities). In addition, pragmatic issues such as the availability of skilled providers and interventions themselves, resources to pay for interventions, as well as family considerations and preferences, may influence and guide treatment decisions.

Although there is increasing evidence that children with ASD who receive appropriate behavioral intervention can have substantial improvements in functioning, we have limited knowledge of the actual numbers of families able to access such services on a community level. Young children with ASD (below 36 months) are often eligible for services through Early Intervention (Part C) programs, with all states and eligible territories currently providing such programs. These systems presumably allow children to receive services based on risk prior to diagnosis as well as post-diagnosis, but services may range in intensity and focus. Children who are over age 3 often have access to additional services through their school district, but the nature of appropriate services provided within these systems varies. A majority of U.S. states (estimated at over 35[200]) have enacted ASD insurance reform legislation that provides for specific access to evidence-based intervention services through private insurance. Again the availability and accessibility of resources for referral varies dramatically across communities

Limitations of the Review Process

We limited this update to comparative studies of behavioral interventions and included only those with at least 10 individuals. Thus, we did not include data from pre-post studies or those with a very small number of children. These would include single-subject design studies that are helpful for understanding focused questions of short-term efficacy in individual children, and that may be useful for explicating mechanisms of action. These studies are less able to contribute to the body of evidence that we sought on population level and generalizable effects. Users of this review may want to take those studies into account as context when applying our findings.

We limited our review to English language studies, not finding evidence that we were missing relevant research in other languages. We did not do a quantitative synthesis given the substantial heterogeneity of the literature base, but we recognize that this lack of synthesis may mitigate the ease with which the findings are applied. Therefore we have tried to provide substantial description that will help end users apply the findings.

Limitations of the Evidence Base

Despite improvements, the existing literature still has significant methodological concerns that in many ways continue to limit the strength of these conclusions. Evidence for the impact of intensive ABA-based interventions on cognitive, language, adaptive skills, and ASD symptoms also highlights important limitations of current treatment modalities. First, even children who demonstrate clinically significant improvements in these areas often continue to display substantial impairment in these same and other areas. Second, not all children receiving intensive ABA-based intervention showed robust improvements in these domains. Thus, although this updated review makes it clearer that early intensive ABA-based intervention improves early impairment related to ASD, it is still challenging to describe the ultimate effect of these improvements in terms of long-term functional and adaptive outcomes on an individual level. Further, although children receiving early intensive developmental and behavioral intervention commonly display substantial improvements, the magnitude of these effects varies across studies and may indicate subgroups showing variable responses to particular interventions. Intervention response is likely moderated by both treatment and child factors. Despite multiple studies of early intensive treatments, intervention approaches still vary substantially, which makes it difficult to tease apart what these unique treatment and child factors may be. Similarly, data on provider type and qualifications are variably reported, and the impact of provider characteristics on treatment outcomes is unclear. Further, researchers have not commonly utilized explicit methodologies or analyses to help elucidate moderation of treatment response across studies. As such, the current evidence is insufficient to adequately identify and target children most likely to benefit from specific interventions.

When examining treatment outcomes, many early intervention studies found that children in all groups improved on cognitive, adaptive, and ASD symptom measures regardless of intervention type, although the degree of improvement was often greater in the treatment group. Results were often confounded by nonrandom assignment of participants, including assignment based on child characteristics (such as having the skills necessary to participate in intervention setting) or parental preference. The latter is especially problematic when outcomes are measured by parent report, given some evidence that parental stress influenced parent perceptions of child outcomes. Additionally, in most studies, both enrolled and control/waitlisted children were receiving concomitant interventions, the magnitude of which was inconsistently documented and controlled for in analyses.

A remaining significant challenge to interpreting the early intensive intervention literature relates to how interventions are described and implemented (see Appendix F for further characterization of the early intervention studies in this review). Although researchers are increasingly attempting to manualize approaches as well as operationalize and measure treatment fidelity, most of the body of literature categorized in this report as “early intensive behavioral and developmental intervention” remains an eclectic grouping. This category of intervention presently groups different treatment approaches (i.e., developmental, intensive behavioral, center based, and combinations), intensity (12 hours over 3 months vs. 30 hours over 1 week), and

duration (weeks to years); varied inclusion and baseline assessment criteria; children of varying ages (intake age ranging from 18 months to 7 years); and many different outcome measurements over different periods of time (weeks to years). Manualizing intensive interventions to be delivered over the months and years for a very heterogeneous patient population is intrinsically challenging. However, recent progress toward this end has shown that children will often respond differentially to early intensive approaches. Unfortunately, we do not yet understand how these specific intervention approaches differentially affect specific subgroups of children with ASD.

Few studies directly compared the effects of well-controlled treatment approaches, instead comparing interventions to non-specific "treatment as usual." Additionally, little data on the practical effectiveness or feasibility of these treatments beyond research studies exist, and questions remain about whether reported findings would generalize on a larger scale within communities. Furthermore, the studies conducted have used small samples, drastically different treatment approaches and duration, and different outcome measurements. Similarly, no studies in this category reported harms of intervention in terms of child, family, or system impact.

Although there was a fairly robust evidence base on CBT, the literature lacks head to head comparisons of treatment or controlled comparisons of combinations of treatments despite the fact that most children are undergoing multiple concurrent treatments. Although well designed, the sample sizes are quite modest. Additionally, the CBT approaches were modified for children with ASD and oftentimes manualized by the authors themselves, which highlights the need for replication by outside investigators. Lastly, the only study that did not show significant benefit in the CBT intervention group compared with it to an active treatment control as opposed to a waitlist or treatment as usual control.[174] This suggests that more studies including active control groups are needed to examine if CBT reduces anxiety more than other treatment modalities.

Research Gaps and Needs

Several behavioral treatment approaches report positive outcomes in children with ASD, increasingly using rigorous designs. Despite this recent and improved rigor, treatments remain understudied. In addition, few studies have attempted to systematically replicate findings of previous work.

Given the heterogeneity of the expression of ASD within and across children, a critical area for further research is understanding which children are likely to benefit from particular interventions. To date, studies have failed adequately to characterize interventions or children receiving intervention such that we can better understand which children are most likely to experience positive outcomes and why. Further, our understanding of early indicators of treatment response is extremely limited, such that evidence-based changes in treatment planning based on an observed response or lack thereof are not possible. This is important to parents, providers, and families as they often want to know not only when a treatment is working, but when limited benefit of treatments may suggest pursuing other treatment options. Similarly, research is lacking on the durability of treatment gains and approaches needed to maintain gains.

Again the accumulated evidence base suggests that although children receiving early intensive intervention demonstrate substantial gains in several areas of functioning (e.g., cognitive ability, language, adaptive, ASD symptoms) on a group level, not all children receiving early intensive intervention demonstrate robust gains. Currently, the evidence suggests some children will show dramatic improvement, others will display robust improvement in some areas with continued areas of vulnerability in others, and other children will show more moderated

response to treatment overall. It is also unclear how similar groups of children will perform at differing levels of intensity of interventions or different treatment approaches and methods.

Child characteristics like baseline cognitive, language, adaptive skill, and ASD symptoms may correlate with treatment outcome; however, such correlational data provides limited information in making predictions of what treatments will work best for individual children. It is possible that meta-analyses of individual patient data may provide additional information for identifying subgroups of responders.

Further, intensive, comprehensive intervention strategies are by their very nature often multi-component. Data on whether specific functional components of the interventions drive effectiveness are currently unavailable as are data on mediators of change. Finally, the intervention research often fails to describe whether treatment effect is modified by family, culture, available resources, and stress. Early intensive behavioral and developmental approaches therefore warrant further research to understand individual response and benefit in the short and long-term across heterogeneous populations. Similarly, evaluations of intervention delivered by community providers are important for comparing effects of such approaches with those of interventions delivered in controlled research environments. Such evaluations are complicated by the complexity of community systems and methodologic challenges including creating similar treatment and control groups and maintaining fidelity; however, they will be increasingly valuable for scaling intervention for ASD. Also important in addressing this gap is improving our currently limited understanding of the effects of provider training and provider characteristics on outcomes of treatment.

A primary methodological concern relates to outcome measurement. Intervention research in the field of ASD has often relied on various and differing ways of marking change, which has limited our ability to understand change within and across individual studies. [201] The manner in which outcomes are operationalized in many studies is often problematic as well. Quite often outcome is operationalized and studied in terms of change on standardized measures of ability referencing normative populations (i.e., IQ measurement, adaptive behavior scores), which may not necessarily be an appropriate or adequate method for measuring or predicting early treatment response, changes in quality of life, or long-term functional outcomes. Such measurement, while providing data that can be compared with that in typically developing populations, may unfortunately miss important information about changes that are relevant within the ASD population. More simply, it is unclear that measures of cognitive ability, language, and ASD diagnostic symptoms are actually ideal or adequately sensitive methods for measuring frequency, intensity, and impairment in children with ASD. Research on appropriate methods to capture meaningful change will be critical to advance our understanding of behavioral interventions. In addition, while studies have improved in reporting a priori determined primary and secondary outcome measures, continued improvements in reporting will benefit the field.

In some aspects of the literature treatments with some replicated studies have emerged. Specifically both social skills interventions and cognitive behavioral interventions for anxiety have demonstrated short-term benefit for some children with ASD. However, this literature focuses almost entirely on older children with ASD and intact cognitive skills. Understanding the impact or lack thereof of such interventions for others with ASD is important. Further, this work has often relied on parent or teacher reports of functioning to gauge change. Such reporting may be useful as a preliminary index or potentially as a component of a broader measurement strategy attempting to index change, but reliance these ratings provides only an intermediate and often

biased assessment of change, with potentially very limited value to understanding how interventions translate in to meaningful long-term functional outcomes.

Because the treatment process for ASD is typically intensive and often requires highly specific and well-trained individuals to deliver to fidelity, questions of feasibility and accessibility are pertinent but largely understudied. Explicit evaluation of treatments of highest impact in community settings as well as studies explicitly evaluating settings and providers would benefit our ability to understand impact and implementation.

Finally, this literature lacks comparisons of interventions and combinations of interventions (e.g., medical interventions, with behavioral interventions, with educational interventions, with allied health interventions), despite the fact that most children are undergoing multiple concurrent treatments. The current review also focused solely on behavioral interventions. Systematic reviews of studies of interventions in other categories (e.g., medical, allied health) would provide useful information for clinicians, researchers, policy makers, and families.

Conclusions

Since our previous review in 2011, we have seen a significant increase in the quality of studies investigating behavioral interventions. Of the 45 comparative studies of behavioral interventions (29 RCTs) in the 2011 review, we considered only two as good quality. Among the new studies of behavioral interventions described in this current review, 19 studies are good quality, and 48 of the 65 included studies are RCTs.

These improvements allow us to make some stronger conclusions about certain elements of the behavioral intervention literature. Considerable and consistent evidence suggests that early behavioral and developmental intervention based on the principles of ABA delivered in intensive ($\geq$15 hours per week) and comprehensive (i.e., addressing numerous areas of functioning) form can significantly affect the development of some children with ASD. The current review includes RCTs of the UCLA/Lovaas-focused approach, a developmentally focused ESDM approach, a school delivered training (LEAP), as well as prospective comparisons of eclectic variants of ABA approaches. Across approaches, children receiving early intensive behavioral and developmental interventions have demonstrated improvements in cognitive, language, adaptive, and ASD impairments compared with children receiving low-intensity interventions and eclectic non-ABA based intervention approaches.

Since our previous review, there have also been substantially more studies of well-controlled low intensity interventions including parent training aimed at social communication skills. This growing evidence base suggests that such interventions may have positive results in very young children's social communication and language use. However, although parent training programs certainly modified parenting behaviors during interactions, data are more limited about their ability to improve broad developmental skills (such as cognition, adaptive behavior, and ASD symptom severity) beyond short-term language gains for some children.

A growing number of studies of improved quality have demonstrated benefit of social skills interventions on at least one outcome measure, but a lack of consistency in the interventions studied and outcome measures utilized makes it difficult to understand the consistency or precision of impact across intervention modes. Further, social skills interventions have also been limited to a restricted range of children to date.

A growing evidence base suggests that children receiving targeted play-based interventions (e.g., joint attention, imitation, play-based interventions) demonstrate improvements in early social communication skills. Children receiving targeted joint attention packages in combination

with other interventions show substantial improvements in joint attention and language skills over time. Young children in play-based interventions may display short-term improvements in early play, imitation, joint attention, and interaction skills. However, there is not substantial evidence that these short-term improvements are linked to broader indices of change over time.

CBT for associated conditions such as anxiety has the largest number of high quality studies in the current review. A strong evidence base suggests that school-aged children with average to above average intelligence and comorbid anxiety symptoms receiving manualized CBT therapy show substantial improvements in anxiety compared with wait-list controls. Importantly, CBT therapy is often targeted, delimited, and has numerous manualized approaches available for study. Further, CBT intervention for anxiety has been studied within a restricted population to date (e.g., average to above average cognitive skills with comorbid anxiety).

In sum, a growing evidence base suggests that behavioral interventions are associated with positive outcomes for children with ASD. Despite improvements in the quality of the included literature, a need remains for studies of interventions across settings and continued improvements in methodologic rigor. Substantial scientific advances are needed to enhance our understanding of which interventions are most effective for specific children with ASD and to isolate elements or components of interventions most associated with effects.

References

1. Manning-Courtney P, Murray D, Currans K, et al. Autism spectrum disorders. Curr Probl Pediatr Adolesc Health Care 2013 Jan;43(1):2-11. PMID: 23332397.

2. Ozonoff S, Goodlin-Jones BL, Solomon M. Evidence-based assessment of autism spectrum disorders in children and adolescents. J Clin Child Adolesc Psychol 2005 Sep;34(3):523-40. PMID: 16083393.

3. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. Fifth ed. Washington DC: American Psychiatric Association 2013.

4. Zwaigenbaum L, Bryson S, Lord C, et al. Clinical assessment and management of toddlers with suspected autism spectrum disorder: insights from studies of high-risk infants. Pediatrics 2009 May;123(5):1383-91. PMID: 19403506.

5. Myers SM, Johnson CP. Management of children with autism spectrum disorders. Pediatrics 2007 Nov;120(5):1162-82. PMID: 17967921.

6. Myers SM. The status of pharmacotherapy for autism spectrum disorders. Expert Opin Pharmacother 2007 Aug;8(11):1579-603. PMID: 17685878.

7. Developmental Disabilities Monitoring Network Surveillance Year Principal I. Prevalence of autism spectrum disorder among children aged 8 years - autism and developmental disabilities monitoring network, 11 sites, United States, 2010. MMWR Surveill Summ 2014 Mar 28;63 Suppl 2:1-21. PMID: 24670961.

8. Fecteau S, Mottron L, Berthiaume C, et al. Developmental changes of autistic symptoms. Autism 2003 Sep;7(3):255-68. PMID: 14516059.

9. Shattuck PT, Seltzer MM, Greenberg JS, et al. Change in autism symptoms and maladaptive behaviors in adolescents and adults with an autism spectrum disorder. J Autism Dev Disord 2007 Oct;37(9):1735-47. PMID: 17146700.

10. McGovern CW, Sigman M. Continuity and change from early childhood to adolescence in autism. J Child Psychol Psychiatry 2005 Apr;46(4):401-8. PMID: 15819649.

11. Seltzer MM, Shattuck P, Abbeduto L, et al. Trajectory of development in adolescents and adults with autism. Ment Retard Dev Disabil Res Rev 2004;10(4):234-47. PMID: 15666341.

12. Ballaban-Gil K, Rapin I, Tuchman R, et al. Longitudinal examination of the behavioral, language, and social changes in a population of adolescents and young adults with autistic disorder. Pediatr Neurol 1996 Oct;15(3):217-23. PMID: 8916159.

13. Billstedt E, Gillberg C, Gillberg C. Autism after Adolescence: Population-Based 13- to 22-Year Follow-Up Study of 120 Individuals with Autism Diagnosed in Childhood. J Autism Dev Disord 2005 Jun;35(3):351-60.

14. Eaves LC, Ho HH. Young Adult Outcome of Autism Spectrum Disorders. J Autism Dev Disord 2008 Apr;38(4):739-47.

15. Howlin P, Goode S, Hutton J, et al. Adult outcome for children with autism. J Child Psychol Psychiatry 2004 Feb;45(2):212-29. PMID: 14982237.

16. Taylor JL, Seltzer MM. Employment and post-secondary educational activities for young adults with autism spectrum disorders during the transition to adulthood. J Autism Dev Disord 2011 May;41(5):566-74. PMID: 20640591.

17. Ganz ML. The lifetime distribution of the incremental societal costs of autism. Arch Pediatr Adolesc Med 2007 Apr;161(4):343-9. PMID: 17404130.

18. Folstein SE, Rosen-Sheidley B. Genetics of autism: complex aetiology for a heterogeneous disorder. Nat Rev Genet 2001 Dec;2(12):943-55. PMID: 11733747.

19. Bailey A, Le Couteur A, Gottesman I, et al. Autism as a strongly genetic disorder: evidence from a British twin study. Psychol Med 1995 Jan;25(1):63-77. PMID: 7792363.

20. Marshall CR, Scherer SW. Detection and characterization of copy number variation in autism spectrum disorder. Methods Mol Biol 2012;838:115-35. PMID: 22228009.

21. Geschwind DH. Genetics of autism spectrum disorders. Trends Cogn Sci 2011 Sep;15(9):409-16. PMID: 21855394.

22. Hallmayer J, Cleveland S, Torres A, et al. Genetic heritability and shared environmental factors among twin pairs with autism. Arch Gen Psychiatry 2011 Nov;68(11):1095-102. PMID: 21727249.

23. Bristol MM, Cohen DJ, Costello EJ, et al. State of the science in autism: report to the National Institutes Health. J Autism Dev Disord 1996 Apr;26(2):121-54. PMID: 8744475.

24. Krakowiak P, Walker CK, Bremer AA, et al. Maternal metabolic conditions and risk for autism and other neurodevelopmental disorders. Pediatrics 2012 May;129(5):e1121-8. PMID: 22492772.

25. Dodds L, Fell DB, Shea S, et al. The role of prenatal, obstetric and neonatal factors in the development of autism. J Autism Dev Disord 2011 Jul;41(7):891-902. PMID: 20922473.

26. Sandin S, Hultman CM, Kolevzon A, et al. Advancing maternal age is associated with increasing risk for autism: a review and meta-analysis. J Am Acad Child Adolesc Psychiatry 2012 May;51(5):477-86 e1. PMID: 22525954.

27. Shelton JF, Tancredi DJ, Hertz-Picciotto I. Independent and dependent contributions of advanced maternal and paternal ages to autism risk. Autism Res 2010 Feb;3(1):30-9. PMID: 20143326.

28. Bhandari A, Sandlow JI, Brannigan RE. Risks to offspring associated with advanced paternal age. J Androl 2011 Mar-Apr;32(2):121-2. PMID: 20467047.

29. Cheslack-Postava K, Liu K, Bearman PS. Closely spaced pregnancies are associated with increased odds of autism in California sibling births. Pediatrics 2011 Feb;127(2):246-53. PMID: 21220394.

30. Gunnes N, Suren P, Bresnahan M, et al. Interpregnancy interval and risk of autistic disorder. Epidemiology 2013 Nov;24(6):906-12. PMID: 24045716.

31. Shelton JF, Hertz-Picciotto I, Pessah IN. Tipping the balance of autism risk: potential mechanisms linking pesticides and autism. Environ Health Perspect 2012 Jul;120(7):944-51. PMID: 22534084.

32. Schultz ST. Does thimerosal or other mercury exposure increase the risk for autism? A review of current literature. Acta Neurobiol Exp (Wars) 2010;70(2):187-95. PMID: 20628442.

33. Ozonoff S, Young GS, Carter A, et al. Recurrence risk for autism spectrum disorders: a Baby Siblings Research Consortium study. Pediatrics 2011 Sep;128(3):e488-95. PMID: 21844053.

34. Gronborg TK, Schendel DE, Parner ET. Recurrence of autism spectrum disorders in full- and half-siblings and trends over time: a population-based cohort study. JAMA Pediatr 2013 Oct;167(10):947-53. PMID: 23959427.

35. Seida JK, Ospina MB, Karkhaneh M, et al. Systematic reviews of psychosocial interventions for autism: an umbrella review. Dev Med Child Neurol 2009 Feb;51(2):95-104. PMID: 19191842.

36. Ospina MB, Krebs Seida J, Clark B, et al. Behavioural and developmental interventions for autism spectrum disorder: a clinical systematic review. PLoS One 2008;3(11):e3755. PMID: 19015734.

37. Parr J. Autism. Clin Evid (Online) 2008. PMID: 19450315.

38. National Autism Center. National Standards Report National Autism Center. Randolph, MA: National Autism Center; 2009. Available at: http://www.nationalautismcenter.org/pdf/NAC%20Standards%20Report.pdf

39. Warren Z, Veenstra-VanderWeele J, Stone W, Bruzek JL, Nahmias AS, Foss-Feig JH, Jerome RN, Krishnaswami S, Sathe NA, Glasser AM, Surawicz T, McPheeters ML. Therapies for Children With Autism Spectrum Disorders. Comparative Effectiveness Review No. 26. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2007-10065-I.) AHRQ Publication No. 11-EHC029-EF. Rockville, MD: Agency for Healthcare Research and Quality. April 2011. Available at: www.effectivehealthcare.ahrq.gov/reports/final.cfm.

40. Committee on Educational Interventions for Children with Autism. Educating Children with Autism. Washington DC: National Academies Press; 2001. Available at: http://www.nap.edu/openbook.php?record_id=10017&page=R2

41. Lovaas OI. Behavioral treatment and normal educational and intellectual functioning in young autistic children. J Consult Clin Psychol 1987 Feb;55(1):3-9. PMID: 3571656.

42. Bryson SE, Rogers SJ, Fombonne E. Autism spectrum disorders: early detection, intervention, education, and psychopharmacological management. Can J Psychiatry 2003 Sep;48(8):506-16. PMID: 14574826.

43. Rogers SJ, Vismara LA. Evidence-Based Comprehensive Treatments for Early Autism. Journal of Clinical Child and Adolescent Psychology 2008 Jan;37(1):8-38.

44. Reichow B, Wolery M. Comprehensive Synthesis of Early Intensive Behavioral Interventions for Young Children with Autism Based on the UCLA Young Autism Project Model. J Autism Dev Disord 2009 Jan;39(1):23-41.

45. Reichow B, Barton EE, Boyd BA, et al. Early intensive behavioral intervention (EIBI) for young children with autism spectrum disorders (ASD). Cochrane Database Syst Rev 2012;10:CD009260. PMID: 23076956.

46. Warren Z, McPheeters ML, Sathe N, et al. A systematic review of early intensive intervention for autism spectrum disorders. Pediatrics 2011 May;127(5):e1303-11. PMID: 21464190.

47. Spreckley M, Boyd R. Efficacy of Applied Behavioral Intervention in Preschool Children with Autism for Improving Cognitive, Language, and Adaptive Behavior: A Systematic Review and Meta-analysis. J Pediatr 2008 Oct 22PMID: 18950798.

48. McConachie H, Diggle T. Parent implemented early intervention for young children with autism spectrum disorder: a systematic review. J Eval Clin Pract 2007 Feb;13(1):120-9. PMID: 17286734.

49. Eldevik S, Hastings RP, Hughes JC, et al. Meta-analysis of Early Intensive Behavioral Intervention for children with autism. J Clin Child Adolesc Psychol 2009 May;38(3):439-50. PMID: 19437303.

50. Howlin P, Magiati I, Charman T. Systematic Review of Early Intensive Behavioral Interventions for Children with Autism. American Journal on Intellectual and Developmental Disabilities 2009 Jan;114(1):23-41.

51. Makrygianni MK, Reed P. A Meta-Analytic Review of the Effectiveness of Behavioural Early Intervention Programs for Children with Autistic Spectrum Disorders. 2010;4:577-93.

52. Virues-Ortega J. Applied behavior analytic intervention for autism in early childhood: meta-analysis, meta-regression and dose-response meta-analysis of multiple outcomes. Clin Psychol Rev 2010 Jun;30(4):387-99. PMID: 20223569. 44. Reichow B, Wolery M. Comprehensive Synthesis of Early Intensive Behavioral Interventions for Young Children with Autism Based on the UCLA Young Autism Project Model. J Autism Dev Disord 2009 Jan;39(1):23-41.

53. Horner RH CE, Halle J, McGee G, Odom S, Wolery M. The use of single subject research to identify evidence-based practice in special education. Except Child 2005;71:165-79.

54. Chou R, Aronson N, Atkins D, et al. AHRQ series paper 4: assessing harms when comparing medical interventions: AHRQ and the effective health-care program. J Clin Epidemiol 2010 May;63(5):502-12. PMID: 18823754.

55. Methods Guide for Effectiveness and Comparative Effectiveness Reviews. AHRQ Publication No. 10(14)-EHC063-EF. Rockville, MD: Agency for Healthcare Research and Quality. January 2014. Chapters available at: www.effectivehealthcare.ahrq.gov

56. Berkman ND, Lohr KN, Ansari M, McDonagh M, Balk E, Whitlock E, Reston J, Bass E, Butler M, Gartlehner G, Hartling L, Kane R, McPheeters M, Morgan L, Morton SC, Viswanathan M, Sista P, Chang S. Grading the Strength of a Body of Evidence When Assessing Health Care Interventions for the Effective Health Care Program of the Agency for Healthcare Research and Quality : An Update. Methods Guide for Comparative Effectiveness Reviews (Prepared by the RTI -UNC Evidence-based Practice Center under Contract No. 290-2007-10056-I).AHRQ Publication No. 13 (4)-EHC130-EF. Rockville, MD: Agency for Healthcare Research and Quality. November 2013. Available at: www.effectivehealthcare.ahrq.gov/reports/final.cfm

57. Smith T, Groen AD, Wynn JW. Randomized trial of intensive early intervention for children with pervasive developmental disorder. Am J Ment Retard 2000 Jul;105(4):269-85. PMID: 10934569.

58. Eldevik S, Eikeseth S, Jahr E, et al. Effects of low-intensity behavioral treatment for children with autism and mental retardation. J Autism Dev Disord 2006 Feb;36(2):211-24. PMID: 16477514.

59. Farrell P, Trigonaki N, Webster D. An exploratory evaluation of two early intervention programmes for young children with autism. Educational and Child Psychology 2005;22(4):29-40.

60. Cohen H, Amerine-Dickens M, Smith T. Early intensive behavioral treatment: replication of the UCLA model in a community setting. J Dev Behav Pediatr 2006 Apr;27(2 Suppl):S145-55. PMID: 16685181.

61. Howard JS, Sparkman CR, Cohen HG, et al. A comparison of intensive behavior analytic and eclectic treatments for young children with autism. Res Dev Disabil 2005 Jul-Aug;26(4):359-83. PMID: 15766629.

62. Zachor DA, Ben-Itzchak E, Rabinovich A-L, et al. Change in Autism Core Symptoms with Early Intervention: predictors and outcomes. Research in Autism Spectrum Disorders 2009;3:967-76.

63. Zachor DA, Ben-Itzchak E, Rabinovich A-L, et al. Change in autism core symptoms with intervention. Research in Autism Spectrum Disorders 2007;1(4):304-17.

64. Reed P, Osborne LA, Corness M. Brief report: relative effectiveness of different home-based behavioral approaches to early teaching intervention. J Autism Dev Disord 2007 Oct;37(9):1815-21. PMID: 17180714.

65. Eikeseth S, Smith T, Jahr E, et al. Intensive behavioral treatment at school for 4- to 7-year-old children with autism. A 1-year comparison controlled study. Behav Modif 2002 Jan;26(1):49-68. PMID: 11799654.

66. Eikeseth S, Smith T, Jahr E, et al. Outcome for children with autism who began intensive behavioral treatment between ages 4 and 7: a comparison controlled study. Behav Modif 2007 May;31(3):264-78. PMID: 17438342.

67. Hayward D, Eikeseth S, Gale C, et al. Assessing progress during treatment for young children with autism receiving intensive behavioural interventions. Autism 2009 Nov;13(6):613-33. PMID: 19933766.

68. Eikeseth S, Hayward D, Gale C, et al. Intensity of Supervision and Outcome for Preschool Aged Children Receiving Early and Intensive Behavioral Interventions: A Preliminary Study. Research in Autism Spectrum Disorders 2009 Jan;3(1):67-73.

69. Drew A, Baird G, Baron-Cohen S, et al. A pilot randomised control trial of a parent training intervention for pre-school children with autism. Preliminary findings and methodological challenges. Eur Child Adolesc Psychiatry 2002 Dec;11(6):266-72. PMID: 12541005.

70. Stahmer AC, Gist K. The effects of an accelerated parent education program on technique mastery and child outcome. Journal of Positive Behavior Interventions 2001 Spr;3(2):75-82.

71. Green J, Charman T, McConachie H, et al. Parent-mediated communication-focused treatment in children with autism (PACT): a randomised controlled trial. Lancet 2010 May 20.

72. Aldred C, Green J, Adams C. A new social communication intervention for children with autism: pilot randomised controlled treatment study suggesting effectiveness. J Child Psychol Psychiatry 2004 Nov;45(8):1420-30. PMID: 15482502.

73. Dawson G, Rogers S, Munson J, et al. Randomized, Controlled Trial of an Intervention for Toddlers With Autism: The Early Start Denver Model. Pediatrics 2010 January 2010.

74. McConachie H, Randle V, Hammal D, et al. A controlled trial of a training course for parents of children with suspected autism spectrum disorder. J Pediatr 2005 Sep;147(3):335-40. PMID: 16182672.

75. Sallows GO, Graupner TD. Intensive behavioral treatment for children with autism: four-year outcome and predictors. Am J Ment Retard 2005 Nov;110(6):417-38. PMID: 16212446.

76. Peters-Scheffer N, Didden R, Mulders M, et al. Low intensity behavioral treatment supplementing preschool services for young children with autism spectrum disorders and severe to mild intellectual disability. Res Dev Disabil 2010 Nov-Dec;31(6):1678-84. PMID: 20627451.

77. Eldevik S, Hastings RP, Jahr E, et al. Outcomes of behavioral intervention for children with autism in mainstream pre-school settings. J Autism Dev Disord 2012 Feb;42(2):210-20. PMID: 21472360.

78. Eikeseth S, Klintwall L, Jahr E, et al. Outcome for Children with Autism Receiving Early and Intensive Behavioral Intervention in Mainstream Preschool and Kindergarten Settings. Research in Autism Spectrum Disorders 2012;6(2):829-35.

79. Kovshoff H, Hastings RP, Remington B. Two-year outcomes for children with autism after the cessation of early intensive behavioral intervention. Behav Modif 2011 Sep;35(5):427-50. PMID: 21586502.

80. Remington B, Hastings RP, Kovshoff H, et al. Early intensive behavioral intervention: outcomes for children with autism and their parents after two years. Am J Ment Retard 2007 Nov;112(6):418-38. PMID: 17963434.

81. Itzchak EB, Zachor DA. Who Benefits from Early Intervention in Autism Spectrum Disorders? Research in Autism Spectrum Disorders 2011;5(1):345-50.

82. Zachor DA, Itzchak EB. Treatment Approach, Autism Severity and Intervention Outcomes in Young Children. Research in Autism Spectrum Disorders 2010;4(3):425-32.

83. Boyd BA, Hume K, McBee MT, et al. Comparative Efficacy of LEAP, TEACCH and Non-Model-Specific Special Education Programs for Preschoolers with Autism Spectrum Disorders. J Autism Dev Disord 2013 Jun 28. PMID: 23812661.

84. Strain PS, Bovey EH. Randomized, Controlled Trial of the Leap Model of Early Intervention for Young Children with Autism Spectrum Disorders. Topics in Early Childhood Special Education 2011;31(3):133-54.

85. Dawson G, Jones EJ, Merkle K, et al. Early behavioral intervention is associated with normalized brain activity in young children with autism. J Am Acad Child Adolesc Psychiatry 2012 Nov;51(11):1150-9. PMID: 23101741.

86. Flanagan HE, Perry A, Freeman NL. Effectiveness of large-scale community-based intensive Behavioral Intervention: A waitlist comparison study exploring outcomes and predictors. Research in Autism Spectrum Disorders 2012;6(2):673-82.

87. Shine R, Perry A. The relationship between parental stress and intervention outcome of children with autism. Journal on Developmental Disabilities 2010;16(2):64-6.

88. Freeman N, Perry A. Outcomes of intensive behavioural intervention in the Toronto Preschool Autism Service. Journal on Developmental Disabilities 2010;16(2):17-32.

89. Perry A, Cummings A, Geier JD, et al. Effectiveness of Intensive Behavioral Intervention in a Large, Community-Based Program. Research in Autism Spectrum Disorders 2008 Oct;2(4):621-42.

90. Perry A, Cummings A, Geier JD, et al. Predictors of Outcome for Children Receiving Intensive Behavioral Intervention in a Large, Community-Based Program. Research in Autism Spectrum Disorders 2011;5(1):592-603.

91. Peters-Scheffer N, Didden R, Mulders M, et al. Effectiveness of low intensity behavioral treatment for children with autism spectrum disorder and intellectual disability. Research in Autism Spectrum Disorders 2013;7(9):1012-25.

92. Pajareya K, Nopmaneejumruslers K. A pilot randomized controlled trial of DIR/Floortime parent training intervention for pre-school children with autistic spectrum disorders. Autism 2011 Sep;15(5):563-77. PMID: 21690083.

93. Carter AS, Messinger DS, Stone WL, et al. A randomized controlled trial of Hanen's 'More Than Words' in toddlers with early autism symptoms. J Child Psychol Psychiatry 2011 Jul;52(7):741-52. PMID: 21418212.

94. Oosterling I, Visser J, Swinkels S, et al. Randomized controlled trial of the focus parent training for toddlers with autism: 1-year outcome. J Autism Dev Disord 2010 Dec;40(12):1447-58. PMID: 20440639.

95. Reed P, Osborne L. Impact of Severity of Autism and Intervention Time-Input on Child Outcomes: Comparison across Several Early Interventions. British Journal of Special Education 2012;39(3):130-6.

96. Roberts J, Williams K, Carter M, et al. A Randomised Controlled Trial of Two Early Intervention Programs for Young Children with Autism: Centre-Based with Parent Program and Home-Based. Research in Autism Spectrum Disorders 2011;5(4):1553-66.

97. McConkey R, Truesdale-Kennedy M, Crawford H, et al. Preschoolers with Autism Spectrum Disorders: Evaluating the Impact of a Home-Based Intervention to Promote Their Communication. Early Child Development and Care 2010;180(3):299-315.

98. Rogers SJ, Estes A, Lord C, et al. Effects of a brief Early Start Denver Model (ESDM)–based parent intervention on toddlers at risk for autism spectrum disorders: A randomized controlled trial. Journal of the American Academy of Child & Adolescent Psychiatry 2012;51(10):1052-65.

99. Wong VCN, Kwan QK. Randomized controlled trial for early intervention for autism: A pilot study of the Autism 1-2-3 project. J Autism Dev Disord 2010;40(6):677-88.

100. Keen D, Couzens D, Muspratt S, et al. The effects of a parent-focused intervention for children with a recent diagnosis of autism spectrum disorder on parenting stress and competence. Research in Autism Spectrum Disorders 2010;4(2):229-41.

101. Strauss K, Vicari S, Valeri G, et al. Parent inclusion in Early Intensive Behavioral Intervention: the influence of parental stress, parent treatment fidelity and parent-mediated generalization of behavior targets on child outcomes. Res Dev Disabil 2012 Mar-Apr;33(2):688-703. PMID: 22188793.

102. Fava L, Strauss K, Valeri G, et al. The Effectiveness of a Cross-Setting Complementary Staff- and Parent-Mediated Early Intensive Behavioral Intervention for Young Children with ASD. Research in Autism Spectrum Disorders 2011;5(4):1479-92.

103. Landa RJ, Holman KC, O'Neill AH, et al. Intervention targeting development of socially synchronous engagement in toddlers with autism spectrum disorder: a randomized controlled trial. J Child Psychol Psychiatry 2011 Jan;52(1):13-21. PMID: 21126245.

104. Landa RJ, Kalb LG. Long-term outcomes of toddlers with autism spectrum disorders exposed to short-term intervention. Pediatrics 2012 Nov;130 Suppl 2:S186-90. PMID: 23118250.

105. Aldred C, Green J, Emsley R, et al. Mediation of treatment effect in a communication intervention for pre-school children with autism. J Autism Dev Disord 2012;42(3):447-54.

106. Estes A, Vismara L, Mercado C, et al. The Impact of Parent-Delivered Intervention on Parents of Very Young Children with Autism. J Autism Dev Disord 2013 Jul 10.

107. Casenhiser DM, Shanker SG, Stieben J. Learning through interaction in children with autism: preliminary data from asocial-communication-based intervention. Autism 2013 Mar;17(2):220-41.

108. Reed P, Osborne LA, Makrygianni M, et al. Evaluation of the Barnet Early Autism Model (BEAM) Teaching Intervention Programme in a "Real World" Setting. Research in Autism Spectrum Disorders 2013 June 2013;7(6):631-8.

109. Schreibman L, Stahmer AC. A Randomized Trial Comparison of the Effects of Verbal and Pictorial Naturalistic Communication Strategies on Spoken Language for Young Children with Autism. J Autism Dev Disord 2013 Nov 23. PMID: 24272416.

110. Perry A, Blacklock K, Dunn Geier J. The relative importance of age and IQ as predictors of outcomes in Intensive Behavioral Intervention. Research in Autism Spectrum Disorders 2013;7(9):1142-50.

111. Reed P, Osborne LA, Corness M. The Real-World Effectiveness of Early Teaching Interventions for Children with Autism Spectrum Disorder. Exceptional Children 2007 Sum;73(4):417-33.

112. Reed P, Osborne LA, Corness M. Effectiveness of Special Nursery Provision for Children with Autism Spectrum Disorders. Autism: The International Journal of Research and Practice 2010;14(1):67-82.

113. Banda DR, Grimmett E. Enhancing Social and Transition Behaviors of Persons with Autism through Activity Schedules: A Review. Education and Training in Developmental Disabilities 2008 Sep;43(3):324-33.

114. Quirmbach LM, Lincoln AJ, Feinberg-Gizzo MJ, et al. Social stories: mechanisms of effectiveness in increasing game play skills in children diagnosed with autism spectrum disorder using a pretest posttest repeated measures randomized control group design. J Autism Dev Disord 2009 Feb;39(2):299-321. PMID: 18704672.

115. Lopata C, Thomeer ML, Volker MA, et al. Effectiveness of a manualized summer social treatment program for high-functioning children with autism spectrum disorders. J Autism Dev Disord 2008 May;38(5):890-904. PMID: 18058012.

116. Solomon M, Goodlin-Jones BL, Anders TF. A social adjustment enhancement intervention for high functioning autism, Asperger's syndrome, and pervasive developmental disorder NOS. J Autism Dev Disord 2004 Dec;34(6):649-68. PMID: 15679185.

117. Frankel F, Myatt R, Sugar C, et al. A Randomized Controlled Study of Parent-assisted Children's Friendship Training with Children having Autism Spectrum Disorders. J Autism Dev Disord 2010 Jan 8PMID: 20058059.

118. Beaumont R, Sofronoff K. A multi-component social skills intervention for children with Asperger syndrome: the Junior Detective Training Program. J Child Psychol Psychiatry 2008 Jul;49(7):743-53. PMID: 18503531.

119. Kroeger KA, Schultz JR, Newsom C. A Comparison of Two Group-Delivered Social Skills Programs for Young Children with Autism. J Autism Dev Disord 2007 May;37(5):808-17.

120. Owens G, Granader Y, Humphrey A, et al. LEGO therapy and the social use of language programme: an evaluation of two social skills interventions for children with high functioning autism and Asperger Syndrome. J Autism Dev Disord 2008 Nov;38(10):1944-57. PMID: 18566882.

121. Golan O, Ashwin E, Granader Y, et al. Enhancing Emotion Recognition in Children with Autism Spectrum Conditions: An Intervention Using Animated Vehicles with Real Emotional Faces. J Autism Dev Disord 2010 Mar;40(3):269-79.

122. Legoff DB, Sherman M. Long-Term Outcome of Social Skills Intervention Based on Interactive LEGO[C] Play. Autism: The International Journal of Research & Practice 2006;10(4):317-29.

123. Williams BT, Gray KM, Tonge BJ. Teaching Emotion Recognition Skills to Young Children with Autism: A Randomised Controlled Trial of an Emotion Training Programme. Journal of Child Psychology and Psychiatry 2012;53(12):1268-76.

124. Koenig K, White SW, Pachler M, et al. Promoting social skill development in children with pervasive developmental disorders: a feasibility and efficacy study. J Autism Dev Disord 2010 Oct;40(10):1209-18. PMID: 20204689.

125. Kasari C, Rotheram-Fuller E, Locke J, et al. Making the connection: randomized controlled trial of social skills at school for children with autism spectrum disorders. J Child Psychol Psychiatry 2012 Apr;53(4):431-9. PMID: 22118062.

126. DeRosier ME, Swick DC, Davis NO, et al. The efficacy of a Social Skills Group Intervention for improving social behaviors in children with High Functioning Autism Spectrum disorders. J Autism Dev Disord 2011 Aug;41(8):1033-43. PMID: 21042870.

127. Lopata C, Thomeer ML, Volker MA, et al. RCT of a manualized social treatment for high-functioning autism spectrum disorders. J Autism Dev Disord 2010 Nov;40(11):1297-310. PMID: 20232240.

128. Begeer S, Gevers C, Clifford P, et al. Theory of mind training in children with autism: A randomized controlled trial. J Autism Dev Disord 2011;41(8):997-1006.

129. Lerner MD, Mikami AY. A preliminary randomized controlled trial of two social skills interventions for youth with high-functioning autism spectrum disorders. Focus on Autism and Other Developmental Disabilities 2012;27(3):147-57.

130. Sutton SK, Burnette CP, Mundy PC, et al. Resting cortical brain activity and social behavior in higher functioning children with autism. J Child Psychol Psychiatry 2005 Feb;46(2):211-22. PMID: 15679529.

131. Castorina LL, Negri LM. The inclusion of siblings in social skills training groups for boys with Asperger syndrome. J Autism Dev Disord 2011 Jan;41(1):73-81. PMID: 20461452.

132. Young RL, Posselt M. Using the transporters DVD as a learning tool for children with Autism Spectrum Disorders (ASD). J Autism Dev Disord 2012 Jun;42(6):984-91. PMID: 21822764.

133. Paynter J, Peterson CC. Further Evidence of Benefits of Thought-Bubble Training for Theory of Mind Development in Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders 2013 February 2013;7(2):344-8.

134. Mandelberg J, Frankel F, Cunningham T, et al. Long-term outcomes of parent-assisted social skills intervention for high-functioning children with autism spectrum disorders. Autism 2013 Aug 30. PMID: 23996903.

135. Ichikawa K, Takahashi Y, Ando M, et al. TEACCH-based group social skills training for children with high-functioning autism: a pilot randomized controlled trial. Biopsychosoc Med 2013;7(1):14. PMID: 24083413.

136. Thomeer ML, Lopata C, Volker MA, et al. Randomized clinical trial replication of a psychosocial treatment for children with high-functioning autism spectrum disorders. Psychology in the Schools 2012;49(10):942-54.

137. Cihak DF, Smith CC, Cornett A, et al. The Use of Video Modeling with the Picture Exchange Communication System to Increase Independent Communicative Initiations in Preschoolers with Autism and Developmental Delays. Focus on Autism and Other Developmental Disabilities 2012;27(1):3-11.

138. White SW, Koenig K, Scahill L. Group Social Skills Instruction for Adolescents with High-Functioning Autism Spectrum Disorders. Focus on Autism and Other Developmental Disabilities 2010;25(4):209-19.

139. Solomon M, Ono M, Timmer S, et al. The effectiveness of parent-child interaction therapy for families of children on the autism spectrum. J Autism Dev Disord 2008 Oct;38(9):1767-76. PMID: 18401693.

140. Kasari C, Paparella T, Freeman S, et al. Language outcome in autism: randomized comparison of joint attention and play interventions. J Consult Clin Psychol 2008 Feb;76(1):125-37. PMID: 18229990.

141. Kasari C, Freeman S, Paparella T. Joint attention and symbolic play in young children with autism: a randomized controlled intervention study. J Child Psychol Psychiatry 2006 Jun;47(6):611-20. PMID: 16712638.

142. Field T, Sanders C, Nadel J. Children with autism display more social behaviors after repeated imitation sessions. Autism 2001 Sep;5(3):317-23. PMID: 11708590.

143. Heimann M, Laberg KE, Nordoen B. Imitative Interaction Increases Social Interest and Elicited Imitation in Non-verbal Children with Autism. Infant and Child Development. Special Issue: Imitation and Socio-Emotional Processes: Implications for Communicative Development and Interventions 2006 May-Jun;15(3):297-309.

144. Escalona A, Field T, Nadel J, et al. Brief report: Imitation effects on children with autism. J Autism Dev Disord 2002 Apr;32(2):141-4.

145. Gulsrud AC, Kasari C, Freeman S, et al. Children with autism's response to novel stimuli while participating in interventions targeting joint attention or symbolic play skills. Autism 2007 Nov;11(6):535-46.

146. Whittingham K, Sofronoff K, Sheffield J, et al. Stepping Stones Triple P: An RCT of a Parenting Program with Parents of a Child Diagnosed with an Autism Spectrum Disorder. Journal of Abnormal Child Psychology 2009 May;37(4):469-80.

147. Whittingham K, Sofronoff K, Sheffield J, et al. Do Parental Attributions Affect Treatment Outcome in a Parenting Program? An Exploration of the Effects of Parental Attributions in an RCT of Stepping Stones Triple P for the ASD Population. Research in Autism Spectrum Disorders 2009 Jan;3(1):129-44.

148. Kasari C, Gulsrud A, Freeman S, et al. Longitudinal follow-up of children with autism receiving targeted interventions on joint attention and play. J Am Acad Child Adolesc Psychiatry 2012 May;51(5):487-95. PMID: 22525955.

149. Lawton K, Kasari C. Brief Report: Longitudinal Improvements in the Quality of Joint Attention in Preschool Children with Autism. J Autism Dev Disord 2012;42(2):307-12.

150. Kasari C, Gulsrud AC, Wong C, et al. Randomized controlled caregiver mediated joint engagement intervention for toddlers with autism. J Autism Dev Disord 2010;40(9):1045-56.

151. Goods KS, Ishijima E, Chang Y-C, et al. Preschool Based JASPER Intervention in Minimally Verbal Children with Autism: Pilot RCT. J Autism Dev Disord 2013 May 2013;43(5):1050-6.

152. Ingersoll B. Brief report: effect of a focused imitation intervention on social functioning in children with autism. J Autism Dev Disord 2012 Aug;42(8):1768-73. PMID: 22146934.

153. Ingersoll B. Brief report: Pilot randomized controlled trial of reciprocal imitation training for teaching elicited and spontaneous imitation to children with autism. J Autism Dev Disord 2010;40(9):1154-60.

154. Venker CE, McDuffie A, Weismer SE, et al. Increasing Verbal Responsiveness in Parents of Children with Autism: A Pilot Study. Autism: The International Journal of Research and Practice 2012;16(6):568-85.

155. Kaale A, Smith L, Sponheim E. A randomized controlled trial of preschool-based joint attention intervention for children with autism. J Child Psychol Psychiatry 2012 Jan;53(1):97-105. PMID: 21883204.

156. Siller M, Hutman T, Sigman M. A Parent-Mediated Intervention to Increase Responsive Parental Behaviors and Child Communication in Children with ASD: A Randomized Clinical Trial. J Autism Dev Disord 2013;43(3):540-55.

157. Lawton K, Kasari C. Teacher-implemented joint attention intervention: pilot randomized controlled study for preschoolers with autism. J Consult Clin Psychol 2012 Aug;80(4):687-93. PMID: 22582764.

158. Wong CS. A play and joint attention intervention for teachers of young children with Autism: A randomized controlled pilot study. Autism 2013 May 2013;17(3):340-57. PMID: 1463475195; 18038415.

159. Warreyn P, Roeyers H. See what I see, do as I do: Promoting joint attention and imitation in preschoolers with autism spectrum disorder. Autism 2013 Oct 8PMID: 24104513.

160. Schertz HH, Odom SL, Baggett KM, et al. Effects of Joint Attention Mediated Learning for Toddlers with Autism Spectrum Disorders: An Initial Randomized Controlled Study. Early Childhood Research Quarterly 2013 2013;28(2):249-58.

161. Murdock LC, Hobbs JQ. Picture Me Playing: Increasing Pretend Play Dialogue of Children with Autism Spectrum Disorders. J Autism Dev Disord 2011;41(7):870-8.

162. Sofronoff K, Dark E, Stone V. Social vulnerability and bullying in children with Asperger syndrome. Autism 2011 May;15(3):355-72. PMID: 21430018.

163. Sofronoff K, Attwood T, Hinton S, et al. A randomized controlled trial of a cognitive behavioural intervention for anger management in children diagnosed with Asperger syndrome. J Autism Dev Disord 2007 Aug;37(7):1203-14. PMID: 17082978.

164. Sofronoff K, Attwood T, Hinton S. A randomised controlled trial of a CBT intervention for anxiety in children with Asperger syndrome. J Child Psychol Psychiatry 2005 Nov;46(11):1152-60. PMID: 16238662.

165. Wood JJ, Drahota A, Sze K, et al. Cognitive Behavioral Therapy for Anxiety in Children with Autism Spectrum Disorders: A Randomized, Controlled Trial. Journal of Child Psychology and Psychiatry 2009 Mar;50(3):224-34.

166. Wood JJ, Drahota A, Sze K, et al. Brief Report: Effects of Cognitive Behavioral Therapy on Parent-Reported Autism Symptoms in School-Age Children with High-Functioning Autism. J Autism Dev Disord 2009 Nov;39(11):1608-12.

167. Aman MG, McDougle CJ, Scahill L, et al. Medication and Parent Training in Children With Pervasive Developmental Disorders and Serious Behavior Problems: Results From a Randomized Clinical Trial. J Am Acad Child Adolesc Psychiatry 2009 Oct 23PMID: 19858761.

168. Reaven JA, Blakeley-Smith A, Nichols S, et al. Cognitive-Behavioral Group Treatment for Anxiety Symptoms in Children with High-Functioning Autism Spectrum Disorders: A Pilot Study. Focus on Autism and Other Developmental Disabilities 2009;24(1):27-37.

169. Sofronoff K. A Cognitive Behaviour Therapy intervention for anxiety in children with Asperger's syndrome. Good Autism Practice 2003;4:2-8.

170. Sofronoff K, Leslie A, Brown W. Parent management training and Asperger syndrome: a randomized controlled trial to evaluate a parent based intervention. Autism 2004 Sep;8(3):301-17. PMID: 15358872.

171. Chalfant AM, Rapee R, Carroll L. Treating anxiety disorders in children with high functioning autism spectrum disorders: a controlled trial. J Autism Dev Disord 2007 Nov;37(10):1842-57. PMID: 17171539.

172. Sofronoff K, Farbotko M. The effectiveness of parent management training to increase self-efficacy in parents of children with Asperger syndrome. Autism 2002 Sep;6(3):271-86. PMID: 12212918.

173. Reaven J, Blakeley-Smith A, Culhane-Shelburne K, et al. Group cognitive behavior therapy for children with high-functioning autism spectrum disorders and anxiety: a randomized trial. J Child Psychol Psychiatry 2012 Apr;53(4):410-9. PMID: 22435114.

174. Sung M, Ooi YP, Goh TJ, et al. Effects of cognitive-behavioral therapy on anxiety in children with autism spectrum disorders: a randomized controlled trial. Child Psychiatry Hum Dev 2011 Dec;42(6):634-49. PMID: 21660428.

175. Scarpa A, Reyes NM. Improving emotion regulation with CBT in young children with high functioning autism spectrum disorders: a pilot study. Behav Cogn Psychother 2011 Jul;39(4):495-500. PMID: 21457605.

176. McNally Keehn RH, Lincoln AJ, Brown MZ, et al. The Coping Cat program for children with anxiety and autism spectrum disorder: A pilot randomized controlled trial. J Autism Dev Disord 2013;43(1):57-67.

177. Storch EA, Arnold EB, Lewin AB, et al. The effect of cognitive-behavioral therapy versus treatment as usual for anxiety in children with autism spectrum disorders: A randomized, controlled trial. Journal of the American Academy of Child & Adolescent Psychiatry 2013;52(2):132-42.

178. Drahota A, Wood JJ, Sze KM, et al. Effects of cognitive behavioral therapy on daily living skills in children with high-functioning autism and concurrent anxiety disorders. J Autism Dev Disord 2011 Mar;41(3):257-65. PMID: 20508979.

179. Farmer C, Lecavalier L, Yu S, et al. Predictors and moderators of parent training efficacy in a sample of children with autism spectrum disorders and serious behavioral problems. J Autism Dev Disord 2012 Jun;42(6):1037-44. PMID: 21822762.

180. Scahill L, McDougle CJ, Aman MG, et al. Effects of risperidone and parent training on adaptive functioning in children with pervasive developmental disorders and serious behavioral problems. J Am Acad Child Adolesc Psychiatry 2012 Feb;51(2):136-46. PMID: 22265360.

181. Arnold LE, Aman MG, Li X, et al. Research units of pediatric psychopharmacology (RUPP) autism network randomized clinical trial of parent training and medication: One-year follow-Up. Journal of the American Academy of Child & Adolescent Psychiatry 2012;51(11):1173-84.

182. Fujii C, Renno P, McLeod BD, et al. Intensive cognitive behavioral therapy for anxiety disorders in school-aged children with autism: A preliminary comparison with treatment-as-usual. School Mental Health 2013;5(1):25-37.

183. Kenworthy L, Anthony LG, Naiman DQ, et al. Randomized controlled effectiveness trial of executive function intervention for children on the autism spectrum. J Child Psychol Psychiatry 2013 Nov 21PMID: 24256459.

184. Handen BL, Johnson CR, Butter EM, et al. Use of a Direct Observational Measure in a Trial of Risperidone and Parent Training in Children with Pervasive Developmental Disorders. J Dev Phys Disabil 2013 Jun 1;25(3):355-71. PMID: 23730123.

185. Doyle T, Arnedillo-Sanchez I. Using Multimedia to Reveal the Hidden Code of Everyday Behaviour to Children with Autistic Spectrum Disorders (ASDs). Computers & Education 2011;56(2):357-69.

186. Coben R, Padolsky I. Assessment-guided neurofeedback for autistic spectrum disorder. Journal of Neurotherapy 2007;11(1):5-23.

187. Jarusiewicz B. Efficacy of Neurofeedback for Children in the Autistic Spectrum: A Pilot Study. Journal of Neurotherapy 2002;6(4):39-49.

188. Adkins KW, Molloy C, Weiss SK, et al. Effects of a standardized pamphlet on insomnia in children with autism spectrum disorders. Pediatrics 2012 Nov;130 Suppl 2:S139-44. PMID: 23118244.

189. Cortesi F, Giannotti F, Sebestiani T, et al. Controlled-release melatonin, singly and combined with cognitive behavioural therapy, for persistent insomnia in children with autism spectrum disorders: A randomized placebo-controlled trial. Journal of Sleep Research 2012;21(6):700-9.

190. Malow BA, Adkins KW, Reynolds A, et al. Parent-Based Sleep Education for Children with Autism Spectrum Disorders. J Autism Dev Disord 2013 Jun 11PMID: 23754339.

191. Sharp WG, Burrell TL, Jaquess DL. The Autism MEAL Plan: A parent-training curriculum to manage eating aversions and low intake among children with autism. Autism 2013 Oct 7PMID: 24101716.

192. Kouijzer MEJ, van Schie HT, de Moor JMH, et al. Neurofeedback treatment in autism. Preliminary findings in behavioral, cognitive, and neurophysiological functioning. Research in Autism Spectrum Disorders 2010;4(3):386-99.

193. Manente CJ, Maraventano JC, LaRue RH, et al. Effective Behavioral Intervention for Adults on the Autism Spectrum: Best Practices in Functional Assessment and Treatment Development. Behavior Analyst Today 2010;11(1):36-48.

194. Kouijzer MEJ, de Moor JMH, Gerrits BJL, et al. Neurofeedback Improves Executive Functioning in Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders 2009 Jan;3(1):145-62.

195. Kouijzer MEJ, de Moor JMH, Gerrits BJL, et al. Long-term effects of neurofeedback treatment in autism. Research in Autism Spectrum Disorders 2009;3(2):496-501.

196. Charlop-Christy MH, Haymes LK. Using obsessions as reinforcers with and without mild reductive procedures to decrease inappropriate behaviors of children with autism. J Autism Dev Disord 1996 Oct;26(5):527-46.

197. Peters-Scheffer N, Didden R, Korzilius H, et al. A Meta-Analytic Study on the Effectiveness of Comprehensive ABA-Based Early Intervention Programs for Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders 2011;5(1):60-9.

198. Kuppens S, Onghena P. Sequential Meta-Analysis to Determine the Sufficiency of Cumulative Knowledge: The Case of Early Intensive Behavioral Intervention for Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders 2012;6(1):168-76.

199. Reichow B. Overview of Meta-Analyses on Early Intensive Behavioral Intervention for Young Children with Autism Spectrum Disorders. J Autism Dev Disord 2012;42(4):512-20.

200. Autism Speaks. Autism Speaks: State initiatives. Available at: http://www.autismspeaks.org/advocacy/states. Accessed on 04/14/2014.

201. Bolte EE, Diehl JJ. Measurement tools and target symptoms/skills used to assess treatment response for individuals with autism spectrum disorder. J Autism Dev Disord 2013 Nov;43(11):2491-501. PMID: 23479074.

Abbreviations

ABA	Applied Behavior Analysis
ABC-H	Aberrant Behavior Checklist – Hyperactivity/Noncompliance
ADI-R	Autism Diagnostic Interview - Revised
ADOS	Autism Diagnostic Observation Schedule
AEPS	Assessment Evaluation and Programming System for Infants
AHRQ	Agency for Healthcare Research and Quality
ASD	Autism Spectrum Disorder
BASC	Behavioral Assessment System for Children
CAM	Complementary and Alternative Medicine
CARS	Childhood Autism Rating Scale
CBT	Cognitive Behavioral Therapy
CER	Comparative Effectiveness Review
CGI-I	Clinical Global Impression-Improvement
CGI-S	Clinical Global Impression-Severity
DIR	Developmental, Individual Differences, Relationship-based model
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, 4th Edition
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5th Edition
DQ	Developmental Quotient
EEG	Electroencephalogram
EPC	Evidence-based Practice Center
ERIC	Educational Resources Information Clearinghouse
ESDM	Early Start Denver Model
GARS	Gilliam Autism Rating Scale
HSQ	Home Situations Questionnaire
IQ	Intelligence Quotient
KQ	Key Question
JASP/ER	Joint Attention and Symbolic Play/Engagement and Regulation Intervention
LEAP	Learning Experiences and Alternative Program for Preschoolers
M-CHAT	Modified Checklist for Autism in Toddlers
MEHRIT	Milton and Ethel Harris Research Initiative Treatment Program
NR	Not Reported
nRCT	Non-Randomized Controlled Trial
NS	Not Statistically Significant
PARS	Pediatric Anxiety Rating Scale
PDD-NOS	Pervasive Developmental Disorder- Not Otherwise Specified
PECS	Picture Exchange Communication System
PEER	Peer-Mediated Social Skills Training
PICOTS	Population, Intervention, Comparator, Outcomes, Timing, and Setting
RCT	Randomized Controlled Trial
SCARED	Screen for Childhood Anxiety Related Emotional Disorders
SDARI	Sociodramatic Affective Relational Intervention
SOE	Strength of the evidence
SS GRIN-HFA	Social Skills Group Intervention – High Functioning Autism
TEP	Technical Expert Panel
TOO	Task Order Officer
TEACCH	Treatment and Education of Autistic and Related Communication Handicapped Children
UCLA	University of California, Los Angeles

Appendix A. Search Strategies

Table A-1. PubMed search strategies

Search terms		Search results
#1	Autistic[tiab] OR autism[tiab] OR autistic disorder[mh] OR asperger syndrome[mh] OR child development disorders, pervasive[mh:noexp] OR asperger[tiab] OR asperger's[tiab] OR aspergers[tiab] OR pervasive development[tiab] OR pervasive developmental[tiab] OR pdd[tiab]	26442
#2	therapy[sh] OR therapeutics[mh] OR teaching[mh] OR psychotherapy[mh] OR treatment outcome[mh]	6660534
#3	#1 AND #2 AND eng[la] AND humans[mh]	6377
#4	newspaper article[pt] OR letter[pt] OR comment[pt] OR case reports[pt] OR review[pt] OR practice guideline[pt] OR news[pt] OR editorial[pt] OR historical article[pt] OR meta-analysis[pt] OR legal cases[pt] OR published erratum[pt] OR congresses[pt]	4864950
#17	#3 NOT #4 AND 2000:2013[dp]	2505

Key: [mh] Medical Subject Heading; [tiab] title/abstract word; [pt] publication type; [sh] subheading; [dp] publication date; [la] language; [pt] publication type

Table A-2. PsycINFO search strategies (ProQuest interface)

Search terms		Search results
#1	SU.EXACT.EXPLODE("pervasive developmental disorders" or "aspergers syndrome" or "autism")	24282
#2	SU.EXACT.EXPLODE("Treatment") OR SU.EXACT.EXPLODE("Medicinal Herbs and Plants") OR SU.EXACT.EXPLODE("Dietary Supplements") OR SU.EXACT.EXPLODE("Nutrition") OR SU.EXACT.EXPLODE("Vitamins")	562313
#3	#1 and #2 and DTYPE(journal article) and (ME(empirical study) or ME(field study) or ME(followup study) or ME(longitudinal study) or ME(prospective study) or ME(qualitative study) or ME(quantitative study) or ME(retrospective study) or ME(treatment outcome/clinical trial)) and LA(English), limited to peer-reviewed journals and human population, limited to publication date 2000 to present	1089**

Key: DE subject descriptor; PT publication type; ME methodology; AE age group

Table A-3. ERIC search strategies (ProQuest interface)

Search terms		Search results
#1	SU.EXACT.EXPLODE("Autism") OR SU.EXACT("Pervasive Developmental Disorders") OR SU.EXACT.EXPLODE("Asperger Syndrome")	9380
#2	SU.EXACT.EXPLODE("Therapy") OR SU.EXACT.EXPLODE("Intervention") OR SU.EXACT.EXPLODE("Outcomes of Treatment") OR SU.EXACT.EXPLODE("Special Education") OR SU.EXACT.EXPLODE("Dietetics") OR SU.EXACT.EXPLODE("Nutrition") OR SU.EXACT.EXPLODE("Adapted Physical Education") OR SU.EXACT.EXPLODE("Therapeutic Environment") OR SU.EXACT.EXPLODE("Food")	80298
#3	#1 and #2 and LA(English), limited to peer reviewed journals, 2000 to present	1782**

Key: DE subject descriptor, KW keyword

Appendix B. Screening and Quality Assessment Forms

Abstract Review Form

REF ID: **Reviewer Initials:**			
1. Addresses **intervention approach and outcomes** for young children (0-12 years) with ASD or at risk for ASD.	Yes	No	Cannot Determine
2. Original research (includes primary research studies and systematic reviews and meta-analyses)	Yes	No	Cannot Determine
3. Includes individuals with ASD in target age range (0-12 years).	Yes	No	Cannot Determine
4. Addresses one of the following: • treatment modality for ASD intended to modify core symptoms of ASD in individual diagnosed/at risk • short or long term outcomes of treatment intended to modify core symptoms/co-morbidities of ASD in individual diagnosed/at risk; outcomes include parent or child QOL • modifiers of treatment outcomes in young children with ASD • generalization of treatment outcomes to another person/context • drivers of treatment outcomes • harms/adverse effects associated with treatment intended to modify core symptoms of ASD in individual diagnosed/at risk	Yes	No	Cannot Determine
5. Eligible study size (at least 10 total participants in target population)	Yes	No	Cannot Determine
6. If excluded, retain for review of references or background/contextual questions (screening or treatment resources, stability of diagnosis)?	Yes	No	Cannot Determine
Comments:			

Full Text Review Form

REFID: **Reviewer Initials:**		
1. Does the study include participants ages 2-12 (mean age+SD less than or equal to 12 yrs 11 mo) diagnosed with ASD or 0-2 at risk for ASD diagnosis?	Yes	No
2. Is the study original research (includes systematic review or meta-analysis)?	Yes	No
3. Does the study include at least 10 individuals with ASD in the target age range?	Yes	No
4. Does the study provide data related to at least one of the following? • Effects of intervention on core ASD symptoms OR commonly associated symptoms (e.g., motor, sensory, medical, mood/anxiety, irritability, IQ/cognition, and hyperactivity) • Modifers of treatment outcomes • Generalizability of intervention effects to other contexts (e.g., people, places, materials) • Intervention components that drive outcomes • Harms of intervention • Child or caregiver quality of life	Yes	No
5. If excluded, retain this paper for background or review of references?	Yes	No
Comments:		

Quality/Risk of Bias Rating Form

REFID:_____ **REVIEWER:**_____

Question				
Study Design				
Did the study employ a group design?	Yes	No		
Were the groups randomly assigned?	Yes	No		
Was there an appropriate comparison group?	Yes	No or NR		
If an RCT, was randomization done correctly?	Yes	No	NR	NA (non-RCT)
Participant Ascertainment/Inclusion				
Was a valid diagnostic approach for ASD used within the study, or were referred participants diagnosed using a valid approach?	A. clinical DSM-IV-based diagnosis + ADI-R and/or ADOS B. [clinical DSM-IV-based diagnosis + other] OR [ADOS + other, such as SRS, CARS, SCQ, CAST, ASSQ, OR STAT, MCHAT for under 30 months] C. Only clinical DSM-IV-based diagnosis OR Only ADOS D. Neither clinical DSM-IV-based diagnosis NOR ADOS			
Was the sample clearly characterized (e.g., information provided to characterize participants in terms of impairments associated with their ASD, such as cognitive or developmental level)?	Yes	No or NR		
Were inclusion and exclusion criteria clearly stated?	Yes	No or NR		
Do the authors report attrition?	Yes	No		
Were characteristics of drop-out group evaluated for differences with the participant group as a whole?	Yes	No or NR	NA or minimal attrition	
Intervention				
Was the intervention fully described?	Yes	No or NR		
For behavioral studies, was treatment fidelity monitored in a systematic way?	Yes	No or NR	NA	
Did the authors measure and report adherence to the intended treatment process?	Yes	No or NR		
Did the authors report differences in or hold steady all concomitant interventions?	Yes	No or NR		
Outcome Measurement				
Did outcome measures demonstrate adequate reliability and validity	Yes	No or NR		

(including interobserver reliability for behavior observation coding)?			
Were the primary & secondary outcomes clearly specified a priori?	Yes	No or NR	
Were outcome data collected from sources appropriate to the target outcome (e.g. parent report, teacher report, direct behavior observation)?	Yes	No or NR	
Were outcomes coded by individuals blinded to the intervention status of the participants?	Yes	No or NR	
Analysis			
Was an appropriate statistical analysis used?	Yes	No	
a. For RCT's, was there an intent-to treat analysis?	Yes	No	NA
b. For negative studies, was a power calculation provided?	Yes	No	NA
c. Did the study correct for multiple testing?	Yes	No	NA
d. For observational studies, were potential confounders and effect measure modifiers captured?	Yes	No	NA
e. For observational studies, were potential confounders and effect measure modifiers handled appropriately?	Yes	No	NA
External Validity			
Were outcomes measured in at least one context outside of the treatment setting?	Yes	No or NR	
Were outcomes measured in natural environments to assess generalization?	Yes	No or NR	
Were follow-up measures of outcome conducted to assess maintenance of skills at least 3 months after the end of treatment?	Yes	No or NR	NA
Other			
Record duration of intervention:			
Timing of last follow-up after completion of intervention (e.g., immediately, 3 months after end of intervention):			

Note: See more information on quality approach in Appendix D

Appendix C. Evidence Table

Table C-1. Evidence table

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Boyd et al., 2013[1] **Country:** US **Intervention setting:** Public school classrooms **Enrollment period:** NR **Funding:** Institute of Education Sciences, US Department of Education **Design:** Quasi-experimental study	**Intervention:** LEAP and TEACCH, 6-week time window at the beginning and end of school year (at least 6 months apart) **Assessments:** parent; teacher; researchers **Groups:** **G1:** TEACCH **G2:** LEAP **G3**: non-model specific practices **Provider:** teachers **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:**	**Inclusion criteria:** Teachers**:** • public school classrooms • teachers had to be certified to teach • TEACCH and LEAP teachers needed to attend formal training Children**:** • 3-5 years of age at time of enrollment • previous clinical diagnosis or educational label consistent with Autism spectrum disorder (ASD) or developmental delay • met diagnostic criteria on Autism Diagnostic Observation Schedule (ADOS) and/or Social Communication Questionnaire (SCQ) **Exclusion criteria:** Teachers**:** • teaching < 2 years in their respective	**Overall ratings:** Autism characteristics and severity **G1:** -0.11 ± 0.76 **G2:** 0.066 ± 0.765 **G3:** 0.381 ± 0.859 **Social skills, mean ± SD:** Reciprocal social interaction, teacher-rated **G1:** 0.014 ± 0.999 **G2:** 0.24 ± 0.877 **G3:** 0.18 ± 0.874 Reciprocal social interaction, parent-rated **G1:** 0.005 ± 0.834 **G2:** -0.056 ± 1.015 **G3:** 0.325 ± 0.785 **Communication/ language, mean ± SD:** Communication: **G1:** 0.214 ± 0.858 **G2:** 0.081 ± 1.045 **G3:** -0.403 ± 0.784 **Repetitive behavior, mean ± SD:** Sensory and repetitive behaviors, teacher-rated (SRB-T): **G1:** -0.069 ± 0.809 **G2:** -0.176 ± 0.768 **G3:** 0.179 ± 0.92	**Overall ratings:** Autism characteristics and severity **G1:** -0.299 ± 0.928 **G2:** -0.144 ± 0.837 **G3:** 0.124 ± 0.866 p=NS **Social skills, mean ± SD:** Reciprocal social interaction, teacher-rated **G1:** -0.28 ± 1.149 **G2:** -0.152 ± 1.039 **G3:** -0.077 ± 0.926 p=NS Reciprocal social interaction, parent-rated **G1:** -0.257 ± 0.969 **G2:** -0.117 ± 1.012 **G3:** 0.17 ± 0.845 p=NS **Communication/ language, mean ± SD:** Communication: **G1:** 0.441 ± 0.937 **G2:** 0.238 ± 1.102 **G3:** -0.317 ± 0.878 p=NS **Repetitive behavior:** Sensory and repetitive behaviors, teacher-rated:

Classrooms: **G1:** 25 **G2:** 22 **G3:** 27 Participants: **G1:** 85 **G2:** 54 **G3:** 59 **N at follow-up:** **G1**: 81 **G2**: 48 **G3**: 56	classroom types prior to enrollment • failing to meet prior determined classroom fidelity and/or quality rating scales Children**:** • previous exposure to the comparison comprehensive treatment model (CTM) • < 6 months of exposure to the treatment or control intervention • significant uncorrected vision or hearing impairment, uncontrolled seizure disorder or traumatic brain injury • family not proficient in English **Age, mean/yrs ± SD:** **G1:** 4.00 ± 0.57 **G2:** 3.96 ± 0.70 **G3:** 4.07 ± 0.64 **Mental age, mean/yrs (range):** NR **Sex, n (%):** Male: **G1**: 71 (83.5) **G2**: 42 (77.8) **G3**: 52 (88.1)	Sensory and repetitive behaviors, parent-rated: **G1:** 0.025 ± 0.879 **G2:** -0.017 ± 1.03 **G3:** 0.169 ± 1.06 **Motor skills:** Fine motor (FM): **G1:** 0.01 ± 0.632 **G2:** -0.165 ± 0.812 **G3:** -0.364 ± 0.648	**G1:** -0.069 ± 0.809 **G2:** -0.176 ± 0.768 **G3:** 0.179 ± 0.92 p=NS Sensory and repetitive behaviors, parent-rated: **G1:** 0.025 ± 0.879 **G2:** -0.017 ± 1.03 **G3:** 0.169 ± 1.06 p=NS **Motor skills:** Fine motor : **G1:** 0.44 ± 0.763 **G2:** 0.072 ± 0.821 **G3:** -0.183 ± 0.682 p=NS **Harms:** NR **Modifiers:** NR

	Female: **G1:** 14 (16.5) **G2:** 12 (22.2) **G3:** 7 (11.9) Missing: **G1:** 1 (1.2) **G2:** 0 (0) **G3:** 0 (0) **Race/ethnicity, n (%):** White: **G1:** 32 (37.6) **G2:** 25 (46.3) **G3:** 35 (59.3) Black: **G1:** 14 (16.5) **G2:** 3 (5.6) **G3:** 6 (10.2) Hispanic: **G1:** 31 (36.5) **G2:** 23 (42.6) **G3:** 15 (25.4) Asian: **G1:** 5 (5.9) **G2:** 2 (3.7) **G3:** 3 (5.1) Missing: **G1:** 3 (3.5) **G2:** 1 (1.9) **G3:** 0 (0) **SES:** Caregiver education, n (%): Less than college: **G1**: 44 (51.8)

G2: 25 (46.3)
G3: 25 (42.4)

College or higher:
G1: 39 (45.9)
G2: 28 (51.9)
G3: 32 (54.2)

Missing:
G1: 2 (2.4)
G2: 1 (1.9)
G3: 2 (3.4)

Household income, n (%):
< $20K-$39,000:
G1: 30 (35.3)
G2: 14 (25.9)
G3: 16 (27.1)

$40 k-$79,999:
G1: 22 (25.9)
G2: 18 (33.3)
G3: 13 (22.0)

>$80K:
G1: 29 (34.1)
G2: 18 (33.3)
G3: 25 (42.4)

Missing:
G1: 4 (4.7)
G2: 4 (7.4)
G3: 5 (8.5)

Diagnostic approach:
Referral

Diagnostic tool/method:
Autism Diagnostic Observation Schedule

	(ADOS) and/or Social Communication Questionnaire (SCQ) **Diagnostic category, n (%):** NR **Other characteristics, n (%):** School setting: **G1**: Urban: 13 (52) Suburban: 12 (48) Rural: 0 (0.00) **G2**: Urban: 10 (45.45) Suburban: 11 (50.0) Rural: 1 (4.55) **G3**: Urban: 18 (64.29) Suburban: 10 (35.71) Rural: 0 (0.00)

Comments: All data reflect composite variables

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Casenhiser et al., 2013 [2] **Country:** USA and Canada **Intervention setting:** Treatment center, home **Enrollment period:** NR **Funding:** Harris Steel Foundation and the Harris Family, Unicorn Foundation, Cure Autism Now, the Public Health Agency of Canada, the Templeton Foundation, and York University **Design:** RCT	**Intervention:** Milton & Ethel Harris Research Initiative Treatment program (MEHRIT), 2hrs/week Community treatment, 3.9hrs/week **Assessments:** Modified Child Behavior Rating Scale (mCBRS), Pre School Language Scale IV (PLS) and Comprehensive Assessment of Spoken Language (CASL) conducted by licensed speech language pathologists at 0 and 12 months post intervention Parent behavior scores from MEHRIT fidelity scale conducted by MEHRIT therapists at 0 and 12 months post intervention **Groups:** **G1:** MEHRIT **G2:** Community treatment **Provider:** Speech language pathologists Occupational therapists **Treatment manual**	**Inclusion criteria:** All children who had completed 12 months of MEHRIT (or 12 months in the CT group) and for whom a semi-structured parent-child interaction was videotaped both prior to intervention and following 12 months of intervention. Previously diagnosed with Autism Spectrum disorders(ASDs) Diagnoses confirmed using ADOS and Autism Diagnostic Interview (ADI) **Exclusion criteria:** Neurological or developmental diagnoses other than ASD Families not able to meet the time requirements of the study **Age, mean/months ± SD:** **G1:** 42.52 ± 8.76 **G2:** 46.38 ± 8.29 **Mental age, mean/yrs (range):** NR **Sex:** NR	**Mean ± SD:** **mCBRS:** Attention to Activity **G1**: 2.96 ± 0.735 **G2**: 3.08 ± 0.796 Involvement **G1**: 2.56 ± 0.583 **G2**: 2.62 ± 0.697 Compliance **G1**: 2.68 ± 0.748 **G2**: 2.85 ± 0.784 Initiation of Joint Attention **G1**: 1.28 ±0.542 **G2**: 1.31 ±0.987 Enjoyment in Interaction **G1**: 3.08 ±0.277 **G2**: 3.35 ±0.485 PLS and CASL: Mean ± SD Developmental quotient (DQ): **G1:** 0.64 ±0.32 **G2:** 0.54 ±0 .26 **Parent behavior scores (from MRHRIT Fidelity scale), Mean ± SD:**	**Mean ± SD:** **mCBRS:** Attention to Activity **G1**: 3.72 ±0.614 **G2**: 3.38 ±0.752 p<0.05, d=0.69 Involvement **G1**: 3.20 ±0.866 **G2**: 2.69 ±0.788 p<0.01,d=0.87 Compliance **G1**: 3.48 ±0.963 **G2**: 3.35 ±0.797 p=ns, d=0.51 Initiation of Joint Attention **G1**: 1.84 ±0.549 **G2**: 1.23 ±0.430 p<0.001, d=1.02 Enjoyment in Interaction **G1**: 3.28 ±0.458 **G2**: 3.23 ±0.430 p<0.05, d=0.63 PLS and CASL: Mean ± SD DQ: **G1:** 0.72 ± 0.39 p = 0.038 d =0.451 **G2:** 0.64 ± 0.32 p < 0.001 d = 0.915

followed: NR **Defined protocol followed:** NR **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies:** **G1:** NR **G2:** Yes **N at enrollment:** **G1:** 25 **G2:** 26 **N at follow-up:** **G1:** 16 **G2:** 13	**Race/ethnicity, n (%):** NR **SES:** Maternal education, n (%): Advance degree **G1:** 2 (8) **G2:** 6 (23.07) Bachelor's degree **G1:** 15 (60) **G2:** 11 (42.30) Associates degree **G1:** 1 (4) **G2:** 3 (11.53) Some University/college **G1:** 7 (28) **G2:** 4 (15.38) High school **G1:** 0 (0) **G2:** 2 (7.69) Household income, n >100,000 (in Canadian $) **G1:** 12 **G2:** 11 50,000-100,000 **G1:** 6 **G2:** 4 <50,000 **G1:** 4 **G2:** 8 NR **G1:** 3 **G2:** 3	Co-regulation **G1:** 1.32 ±1.0 **G2:** 1.23 ±.86 Expression of enjoyment **G1:** 1.80 ±1.23 **G2:** 1.69 ±1.10 Sensory-motor **G1:** 1.60 ±0.87 **G2:** 1.31 ±0.83 Joining **G1:** 1.76 ±0.60 **G2:** 1.58 ±0.50 Reciprocity **G1:** 1.12 ±0.78 **G2:** 0.85 ±0.73 Independent thinking **G1:** 0.60 ±0.65 **G2:** 0.42 ±0.76 Use of Affect **G1:** 1.92 ±0.15 **G2:** 1.65 ±0.80	**G1 vs G2** p = 0.214 **Parent behavior scores (from MEHRIT Fidelity scale), Mean ± SD** N=51 Co-regulation **G1:** 1.92 ±1.22 **G2:** 1.00 ±.69 p<0.001 d=0.996 Expression of enjoyment **G1:** 2.60 ±1.23 **G2:** 1.53 ±1.03 p<0.01 d=0.79 Sensory-motor **G1:**1.88 ±1.1 **G2:**1.19 ±.75 p=ns d=0.393 Joining **G1:** 2.16 (.80) **G2:** 1.19 (.63) p<0.01 d=0.92 Reciprocity **G1:** 1.76 ±1.13 **G2:** .65 ±.80 p<0.01 d=0.863 Independent Thinking **G1:** 1.0 ±.87 **G2:** .50 ±.76 p=ns d=0.389

	Diagnostic approach: In Study Diagnostic tool/method: **For ASD diagnosis:** ADOS (Autism Diagnostic Observation Schedule); ADI (Autism Diagnostic Interview) **Diagnostic category, n (%):** ASD: **G1:** 25 **G2:** 26 **Other characteristics**, n (%)**:** Parental marital status: Married/partnered **G1:** 24 (96) **G2:** 22 (84.61) Single/divorced/separated **G1:** 1 (4) **G2:** 4 (15.38) Mother's native language: English **G1:** 15 (60) **G2:** 12 (46.15) Other **G1:** 10 (40) **G2:** 14 (53.84) Language most often spoken at home English	Use of Affect **G1:** 2.48 ±.82 **G2:** 1.46 ±.71 p<0.001 d=0.962 **Harms:** NR **Modifiers:** NR

	G1: 23 (92) **G2:** 23 (88.46) Other **G1:** 2 (8) **G2:** 3 (11.53)

Table C-1. Evidence table, continued Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Fujii et al. 2013 **Country:** US **Intervention setting:** university clinic or associated autism community clinic **Enrollment period:** NR **Funding:** NR **Design:** RCT	**Intervention:** CBT provided to individual families for 90 minutes (30 minutes separately with child and parents, 30 minutes conjointly with child and parent(s)) using Building Confidence CBT program modified for use with children with ASD; 32 weekly sessions **Assessments:** child and parent report **Groups:** **G1:** intervention **G2:** treatment as usual **Provider:** • 5 graduate students in clinical or educational psychology and 4 postdoctoral students in psychology or psychiatry **Treatment manual followed:** No **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** No **Co-interventions held**	**Inclusion criteria:** Children age 7-11 years old meeting ADOS and ADI-R criteria for ASD ≥ 1 anxiety disorder **Exclusion criteria:** Verbal IQ < 70 Primary comorbid diagnosis other than anxiety (e.g. dysthymic disorder) **Age, mean/yrs ± SD:** **G1:** 8.7 ± 1.8 **G2:** 9.0 ± 1.6 **Mental age, mean/yrs (range):** NR **Sex:** M, n (%): **G1:** 5 (71) **G2:** 4 (80) F, n (%): **G1:** 2 (29) **G2:** 1 (20) **Race/ethnicity, n (%):** White **G1:** 6 (86) **G2:** 3 (60) Asian/Pacific Islander: **G1:** 1 (14) **G2:** 0 (0)	**Overall ratings:** Global Rating of Severity, mean ± SD: NR Social skills: NR Communication/ language: NR Repetitive behavior**:** NR Problem behavior: NR Adaptive behavior: NR **Commonly occurring co-morbidities:** Anxiety diagnoses, n (%): Separation anxiety disorder: **G1:** 3 (43) **G2:** 2 (40) Social phobia disorder: **G1:** 2 (29) **G2:** 3 (60) Obsessive compulsive disorder:	**Overall ratings:** Global Rating of Severity, mean ± SD: NR Social skills: NR Communication/ language: NR Repetitive behavior: NR Problem behavior: NR Adaptive behavior: NR **Commonly occurring co-morbidities:** Anxiety diagnoses, n (%): p=0.013 for any anxiety diagnosis at follow-up between groups vs. baseline Separation anxiety disorder: **G1:** 0 (0) **G2:** 2 (40) Social phobia disorder:

stable during treatment: yes **Concomitant therapies, n (%):** Medication: **G1:** 2 (29) **G2:** 4 (80) Therapy from psychologist, social worker, or behaviorist: **G1:** NR **G2:** 4 (80) School services (aides, speech therapy, or social skills group) **G1:** NR **G2:** 5 (100) Speech therapy: **G1:** 4 (57) **G2:** NR Social skills group in year before enrollment: **G1:** 6 (86) **G2:** NR N at enrollment: **G1:** 10 **G2:** 6 N at follow-up: **G1:** 7 **G2:** 5	African American: **G1:** 0 (0) **G2:** 1 (20) Multiracial: **G1:** 0 (0) **G2:** 1 (20) **SES:** Parent graduated from college, n (%): **G1:** 5 (71) **G2:** 3 (60) **Diagnostic approach:** In Study Diagnostic tool/method: ADOS and ADI-R; anxiety disorders diagnosed suing Anxiety Disorders Interview Schedule: Child and Parent versions **Diagnostic category, n (%):** Autism **G1:** 7 (100) **G2:** 4 (80) PDD-NOS **G1:** 0 (0) **G2:** 1 (20) **Other characteristics, n (%):** NR	**G1:** 1 (14) **G2:** 0 (0) Generalized anxiety disorder: **G1:** 1 (14) **G2:** 0 (0)	**G1:** 1 (14) **G2:** 3 (60) Obsessive compulsive disorder: **G1:** 0 (0) **G2:** 0 (0) Generalized anxiety disorder: **G1:** 1 (14) **G2:** 0 (0) **Harms:** NR **Modifiers:** NR

Table C-1. Evidence table, continued Study Description	**Intervention**	**Inclusion/ Exclusion Criteria/ Population**	**Baseline Measures**	**Outcomes**
Author: Goods et al. 2013[3] **Country:** US **Intervention setting:** non-public preschool **Enrollment period:** 2008-2010 **Funding:** Organization for Autism Research grant 20072725; Autism Speaks grant 5666, NIH/NICHD, and Department of Health and Human Services **Design:** RCT	**Intervention:** Joint Attention and Symbolic Play/Engagement and Regulation Intervention (JASPER) for 12 weeks, 30 minutes twice weekly **Assessments:** observation and researcher assessments **Groups:** **G1:** JASPER intervention **G2:** Standard practice **Provider:** Study personnel (graduate students in educational psychology) **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** Yes **Concomitant therapies, n (%):** NR	**Inclusion criteria:** • diagnosed with autism • between 3-5 years of age • attended non-public school • used less than 10 spontaneous, functional, and communicative words by parent and teacher report and during baseline or entry assessments **Exclusion criteria:** • see inclusion criteria **Age, mean/months ± SD:** **G1:** 48.73 ± 11.68 **G2:** 54.68 ± 10.25 **Mental age, mean/months ± SD:** **G1:** 17.21 ± 3.91 **G2:** 13.91 ± 3.85 **Sex:** NR **Race/ethnicity, n (%):** NR **SES:** Maternal education, n (%): NR	**Social skills:** SPA (baseline, month 0) Play types, mean ± SD: **G1**: 21.14 ± 7.58 **G2**: 17.13 ± 6.83 Entry (3 months later) **G1**: 11.00 ± 8.74 **G2**: 11.50 ± 5.10 **Communication/ language:** RDLS verbal comprehension, mean ± SD: **G1**: 12.14 ± 0.41 **G2**: 12.00 ± 0.34 RDLS expressive language, mean ± SD: **G1**: 13.63 ± 4.57 **G2**: 11.93 ± 0.09 ESCS, initiating joint attention, mean ± SD: **G1**: 2.57 ± 4.39 **G2**: 0.75 ± 2.12 ESCS, initiating requesting, mean ± SD: **G1**: 5.00 ± 3.70 **G2**: 1.88 ± 1.55 Class observation (entry, month 3) Initiating joint attention, mean ± SD:	**Social skills:** SPA Play types, mean ± SD: **G1**: 22.00 ± 10.17 **G2**: 14.33 ± 9.69 p = 0.04 **Communication/ language:** RDLS verbal comprehension, mean ± SD: **G1**: 14.59 ± 5.36 **G2**: 12.05 ± 0.38 p=NS RDLS, expressive language, mean ± SD: **G1**: 14.52 ± 5.38 **G2**: 11.95 ± 0.16 p=NS ESCS, initiating joint attention (IJAs), mean ± SD: **G1**: 0.40 ± 0.89 **G2**: 1.00 ± 1.73 p=NS ESCS, initiating requesting , mean ± SD: **G1**: 4.00 ± 1.87 **G2**: 3.20 ± 2.39 p=NS Class observation initiating joint attention,

N at enrollment: **G1:** 7 **G2:** 8 **N at follow-up:** **G1:** 5 **G2:** 6	Household income, mean (range): NR **Diagnostic approach:** In Study Diagnostic tool/method: ADOS **Diagnostic category, %)** Autism: 100% PDD-NOS: 0 Aspergers: 0 **Other characteristics**, n (%)**:** MSEL baseline development quotient, mean ± SD: **G1:** 37.70 ± 15.21 **G2:** 26.67 ± 10.12 MSEL baseline, visual reception, mean ± SD: **G1:** 22.42 ± 3.26 **G2:** 21.50 ± 4.44 MSEL baseline fine motor, mean ± SD: **G1:** 21.71 ± 3.04 **G2:** 19.13 ± 4.29 MSEL baseline receptive language, mean ± SD: **G1:** 13.86 ± 7.36 **G2:** 8.63 ± 4.66 MSEL baseline expressive language, mean ± SD: **G1:** 10.86 ± 7.76 **G2:** 6.38 ± 3.74	**G1**: 1.50 ± 3.21 **G2**: 0.20 ± 0.45 Class observation, initiating requesting, mean ± SD: **G1**: 1.50 ± 1.76 **G2**: 0.20 ± 0.45 Class observation, (entry, month 3) unengaged, mean % ± SD: **G1:** 44.50 ± 14.86 **G2:** 57.40 ± 34.11	mean ± SD: **G1**: 0.60 ± 1.34 **G2**: 0.25 ± 0.50 p=NS Class observation, initiating requesting, mean ± SD: **G1**: 4.80 ± 4.49 **G2**: 0.00 ± 0.00 p=0.01 Class observation, unengaged, mean ± SD: **G1:** 12.60 ± 10.85 **G2:** 35.00 ± 16.08 p = 0.05 **Harms:** NR **Modifiers:** NR

Table C-1. Evidence table, continued Study Description	**Intervention**	**Inclusion/ Exclusion Criteria/ Population**	**Baseline Measures**	**Outcomes**
Author: Ichikawa et al. 2013[4] **Country:** Japan **Intervention setting:** Psychiatric medical center **Enrollment period:** NR **Funding:** Grant from Meiji Yasuda Mental Health Foundation **Design:** RCT	**Intervention:** TEACCH-based social skills training: group intervention with weekly 2-hour sessions, with 20 sessions over 6 months. Wait list control group: group meetings every 2 months for 6 months with 2 social workers for 30-60 minutes **Assessments:** observed, parent report, teacher report **Groups:** **G1:** TEACCH **G2:** wait list control **Provider:** • 2 psychologists, 2 nursery teachers, 2 social workers, and 2 graduate students, with supervision by an additional psychologist **Treatment manual followed:** yes **Defined protocol followed:** yes **Measure of treatment fidelity reported:** no	**Inclusion criteria:** Age 5-6 years Diagnosis of autism spectrum disorder confirmed by child psychiatrists IQ $\geq$ 75 CARS-TV $\geq$ 25 **Exclusion criteria:** Severe psychiatric comorbidities (e.g. obsessive compulsive disorder, conduct disorder, oppositional defiant disorder) Mother with mental illness with a major obstacle in daily life (e.g. schizophrenia, severe depression, drug or alcohol dependency) **Age, median months (range):** **G1:** 64 (60 – 66) **G2:** 62 (60 – 70) **Mental age, median (range):** DQ (Kyoto Scale of Psychological Development): **G1:** 87 (84-117) **G2:** 88 (78 – 145) **Sex:** M, n (%): **G1:** 4 (80) **G2:** 5 (83.3)	**Social skills:** Interaction Rating Scale, mean ± SD: **G1:** 38.9 ± 4.8 **G2:** 41.5 ± 3.0 **Adaptive behavior:** Strengths and Difficulties Questionnaire, mean ± SD: **G1:** 19.0 ± 3.5 **G2:** 13.2 ± 3.3	**Social skills:** Interaction Rating Scale, mean ± SD: **G1:** 40.2 ± 5.1 **G2:** 39.7 ± 6.0 Difference (95% CI): 2.72 (-5.83, 11.27) Effect size (d): 0.69 **Adaptive behavior:** Strengths and Difficulties Questionnaire, mean ± SD: **G1:** 14.4 ± 4.7 **G2:** 12.5 ± 3.2 Difference (95% CI): -3.12 (-8.42, 2.18) Effect size (d): 0.71 **Harms** None **Modifiers** NR

Co-interventions held stable during treatment: NR	F, n (%): **G1:** 1 (20) **G2:** 1 (16.7)
Concomitant therapies, n (%): NR	**Race/ethnicity, n (%):** NR
	SES:
N at enrollment: **G1:** 5 **G2:** 6 **N at follow-up:** **G1:** 5 **G2:** 6	Maternal education, n (%): High school: **G1:** 2 (40) **G2:** 1 (16.7) Junior college: **G1:** 3 (60) **G2:** 2 (33.3) University: **G1:** 0 **G2:** 3 (50) Household income, mean (range): NR **Diagnostic approach:** In Study Diagnostic tool/method: ICD-10 **Diagnostic category, n (%):** Autism, high functioning: **G1:** 0 (0) **G2:** 3 (50) PDD-NOS **G1:** 4 (80) **G2:** 2 (33.3) Aspergers **G1:** 1 (20)

G2: 1 (16.7)

Other characteristics, n (%):
Autism severity, CARS, median (range):
G1: 32.5 (27.5 – 33.5)
G2: 31.0 (26.5 – 33.0)

SQ (Japanese version of Social Maturity Scale), median (range):
G1: 90 (81 - 101)
G2: 96 (71 – 105)

Comments: Does not report p-values for between group differences; between group differences account for baseline as a covariate

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Kenworthy et al. 2013[5] **Country:** US **Practice setting:** Children's National Medical Center, Center for Autism Spectrum Disorders, Rockville, MD, USA **Intervention setting:** School **Enrollment period:** NR **Funding:** National Institute of Mental Health Organization for Autism Research Isadore and Bertha Gudelsky Family Foundation NIH **Design:** RCT	**Intervention:** Unstuck and On Target (UOT) CBT intervention or Social skills intervention (SS); both interventions for one school-year in 28, 30-40min lessons **Assessments:** Direct Child measures, Parent-rated report, Teacher-rated report IQ and Verbal mental age measured by WASI (Wechsler Abbreviated Scale of Intelligence) Verbal, Performance and Full Scale IQ scores **Groups:** **G1:** CBT **G2:** Social skills **Provider:** Interventionists School staff Parents **Treatment manual followed:** Yes **Defined protocol followed:** NR **Measure of treatment fidelity reported:** Yes	**Inclusion criteria:** Full Scale IQ score >70, a verbal mental age ≥8 years old Met criteria for ASD (ADOS diagnostic algorithm ≥'ASD' threshold Met DSM-IV-TR (American Psychiatric Association, 1994) criteria for a Pervasive Developmental Disorder **Age, mean/yrs ± SD (range):** **G1:** 9.49 ± 1.00 (7.83–11.08) **G2:** 9.58 ± 1.10 (7.92–11.08) **Mental age, mean/yrs (range):** NR **Sex, %** M: **G1:** 87 **G2:** 90 F: **G1:** 13 **G2:** 10 **Race/ethnicity, %:** White **G1:** 70 **G2:** 55 **SES:** **Education, mean ± SD**	NR	**Overall ratings:** Global Rating of Severity, mean ± SD: NR **Direct child measures change scores (post intervention minus preintervention), n, mean ± SEM:** WASI block design **G1:** (n=41), 3.00 ± 1.03 **G2**: (n=17), -0.94 ±1.11 **G1 vs G2** p<0.05 CI 0.65(0.18-1.17) Challenge task flexibility: **G1:** (n=43), -0.53 ± 0.07 **G2:** (n=19), -0.15 ± 0.14 **G1 vs G2** p<0.05 CI -0.72(-1.38 to 0.14) Challenge task plan:

Co-interventions held stable during treatment: NR **Concomitant therapies, % :** Psychometric medication: **G1:** 54.5 **G2:** 60 **N at enrollment:** **G1:** 47 **G2:** 20 **N at follow-up:** **G1:** 43 **G2:** 19	Maternal education **G1:** 1.91 ± 0.88 **G2:** 1.95 ± 0.76 Father's education **G1:** 2.04 ±1.12 **G2:** 1.95 ± 0.91 **Diagnostic approach:** In Study/Referral Diagnostic tool/method: Diagnosis of ASD by ADOS (Autism Diagnostic Observation Schedule, Module 3) Pervasive developmental disorder diagnosis met by DSM-IV-TR **Diagnostic category, n :** ASD **G1:** 47 **G2:** 20 **Other characteristics**, %**:** Public school: **G1:** 96 **G2: 75** **WASI FSIQ, mean ± SD [range]:** **G1:** 108.80 ± 18.52 [75-151] **G2:** 107.63 ± 17.20 [82-150] **ADOS social + communication, Mean ± SD (range):** **G1:** 11.77 ± 3.64	**G1:** (n= 43), -0.33 ± 0.07 **G2:** (n=19), -0.22 ± 0.06 -0.27(-0.77 to 0.18) Challenge task social: **G1:** (n=43), 0.47 ± 0.16 **G2:** (n=19), 0.26 ± 0.30 CI 0.17(-0.42 to 0.77) **Teacher-rated measures change scores (post intervention minus pre intervention), n, mean ± SEM:** BRIEF shift T score **G1:** (n=27), -24.44 ± 3.30 **G2:** (n=18), -9.78 ± 3.59 **G1 vs G2** p<0.01 CI -0.89(-1.62 to 0.33) BRIEF plan/org T score **G1:** (n=28), -19.14 ± 2.39 **G2:** (n=18),

	(7-21) **G2:** 12.40 ± 4.17 (7-20) **ADOS stereotyped behavior, mean ± SD (range):** **G1:** 1.98 ± 1.71 (0-6) **G2:** 1.90 ± 1.33(0-5)	-11.72 ± 3.16 **G1 vs G2** p<0.05 CI -0.57(-1.26 to 0.01) SRS total score **G1:** (n=25), -5.40 ±1.34 **G2:** (n=19), -4.79 ± 2.05 CI -0.08(-0.78 to 0.51) **Parent-rated measures change scores (post intervention minus preintervention), n, mean ± SEM:** BRIEF shift T score **G1:** (n=41), -9.56 ± 2.31 **G2:** (n=19), -0.16 ± 2.99 **G1 vs G2** p<0.01 CI -0.66(-1.24 to 0.15) BRIEF plan/org T score **G1:** (n=42), -5.17 ± 2.00 **G2:** (n=18) 0.61 ± 2.90 **G1 vs G2**

		p<0.05 CI -0.45(-0.97 t 0.07) SRS total score **G1:** (n=42) -7.31 ± 1.65 **G2:** (n=18) -4.11 ± 2.97 CI 0.28(-0.84 to 0.33) **Classroom Observations:** Ability to follow directions **G1 vs G2** p<0.001 Transition smoothly **G1 vs G2** p<0.001 Avoid getting stuck **G1 vs G2** p<0.05 Reduced negativity **G1 vs G2** p=0.053 Social reciprocity **G1 vs G2** p=ns Classroom participation **G1 vs G2** p=ns

Harms: NR

Modifiers: NR

Comments: Baseline measures not provided. Only post-pre treatment change scores reported.

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Malow et al. 2014[6] **Country:** US **Intervention setting:** Home **Enrollment period:** NR **Funding:** UDSHHS, HRSA, Maternal and Child Health Research Program; research was conducted as part of Autism Speaks Autism Treatment Network. **Design:** RCT	**Intervention:** Sleep education curriculum for parents. Parents in the group program received two 2-hour sessions conducted 1 week apart and parents in the individual received one 1-hour session with two follow-up phone calls. **Assessments:** observed, parent report (Actigraphy and parent questionnaires) collected at baseline and 1 month after treatment **Groups:** **G1:** individual sleep education **G2:** group sleep education **Provider:** • Trained educators **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held**	**Inclusion criteria:** age 2-10 years diagnosis of ASD based on interview conducted by psychologist or developmental pediatrician with expertise in ASD that incorporated DSM-IV-TR criteria and confirmation by ADOS Sleep onset latency of at least 30 minutes on three out of 7 nights/week based on parent report and confirmed by 14 scorable days of actigraphy. Children with other sleep difficulties identified as problems by parents Medication free or on stable dose of medication (no change within 30 days of enrolling) with parents agreeing to avoid medication changes during time of study participation Ability to tolerate actigraphy and parental willingness to complete sleep diary Family primary language English	Actigraphy results, mean ± SD Sleep latency, minutes, **G1:** 59.8 ± 31.6 **G2:** 56.0 ± 25.2 Sleep efficiency, % **G1:** 76.2 ± 6.2 **G2:** 76.4 ± 8.0 WASO, min **G1:** 63.8 ± 28.4 **G2:** 60.4 ± 22.1 Total sleep time, min **G1:** 486.9 ± 48 **G2:** 482.4 ± 56.7	Sleep latency, minutes, mean ± SD **G1:** 39.5 ± 21.6 **G2:** 39.7 ± 21.5 **G1 vs G2:** p=0.63 Sleep efficiency, % **G1:** 78.7 ± 5.1 **G2:** 79.8 ± 6.0 **G1 vs G2:** p=0.56 WASO, min **G1:** 59.3 ± 27.3 **G2:** 58.3 ± 23.7 **G1 vs G2:** p=0.37 Total sleep time, min **G1:** 481.1 ± 49.5 **G2:** 488.3 ± 50.3 **G1 vs G2:** p=0.37 **Harms** NR **Modifiers** NR

stable during treatment: Yes **Concomitant therapies, n (%):** Medication type Psychotropic **G1:** 7 (15) **G2:** 6 (18) Melatonin **G1:** 7 (15) **G2:** 5 (15) Stimulants **G1:** 8 (17) **G2:** 6 (18) **N at enrollment:** **G1+ G2:** 114 **N at follow-up:** **G1:** 47 **G2: 33**	Screening by developmental pediatrician to identify medical and behavioral comorbidities that affect sleep (see below) **Exclusion criteria:** children with untreated comorbidities that affect sleep including sleep apnea, epilepsy, gastrointestinal reflux disease, and depression were not enrolled in study until after co-occurring conditions were addressed. Age, mean years ± SD: **G1:** 5.6 ± 2.6 **G2:** 5.9 ± 2.8 **Mental age:** IQ >70, n (%): **G1:** 27 (64%) **G2:** 15 (45%) **Sex:** M, n (%) **G1:** 39 (83) **G2:** 25 (76) F, n (%) **G1:** 8 (17) **G2:** (8 (24) **Race/ethnicity, n (%):** White **G1:** 37 (80) **G2:** 26 (84) **SES:**

	Hollingshead Four-Factor Index, mean ± SD: **G1:** 44.3 ± 13.5 **G2:** 44.7 ± 10.6 **Diagnostic approach:** In Study Diagnostic tool/method: DSM_IV-TR, ADOS **Diagnostic category, n (%):** Autism **G1:** 32 (68) **G2:** 26 (79) PDD-NOS **G1:** 4 (8.5) **G2:** 2 (6) Asperger syndrome **G1:** 11 (23.4) **G2:** 5 (15) **Other characteristics, n (%):** NR

Comments: The Children's Sleep Habits Questionnaire and Behavior and Family Questionnaire results are presented for both groups combined.

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Mandelberg et al. 2013[7] **Country:** US **Intervention setting:** Home & school **Enrollment period:** average of 43.2 months after initial intervention (2004-2008) **Funding:** National Institute of Mental Health, NICHD, NIDCD and NINDS **Design:** RCT Note: See study reporting on this population[8] in 2011 AHRQ review[9]	**Intervention:** UCLA Children's Friendship Training (CFT) Program mode, with 12 weekly hour-long sessions involving separate groups for children and parents; children with other diagnoses were included as peer models **Assessments:** parent and child report **Groups:** **G1:** CFT **Provider:** Psychologist L.C.S.W. Undergraduate psychology students **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR	**Inclusion criteria:** Attending 2nd through 5th grade regular classroom for most of the day without a closely supervising adult Wechsler Intelligence Scale for Children-III (WISC-III) Verbal IQ > 60 Able to switch topics in a conversation when the other person was interested in talking about something else Adequate knowledge of rules in playing ≥ 2 common age-appropriate board games Knowledge of rules to play common school yard games **Exclusion criteria:** Currently prescribed any psychotropic medicine Thought disorders Clinical seizure disorder, gross neurologic disease, or other medical disorder History of taking either CFT or teen adaptation of CFT (PEERS) during follow-up	**Social skills:** Guest play dates, median: **G1:** 1.0 Hosted play dates, median: **G1:** 1.0 Conflict play dates, mean ± SD: **G1:** 5.2 ± 5.0 Social Skills Rating System (SSRS), Social Skills, mean ± SD: **G1:** 72.3 ±12.2 Loneliness, mean ±SD: **G1:** 39.2 ± 12.5 **Problem behavior:** SSRS, Problem Behaviors, mean ± SD: **G1:** 118.7 ± 11.9	**Social skills:** Guest play dates, median: **G1:** 1.8 p<0.05 vs. baseline Hosted play dates, median: **G1:** 1.7 p=NS vs. baseline Conflict play dates, mean ± SD: **G1:** 2.3 ±3.1 p<0.05 vs. baseline Social Skills Rating System (SSRS), Social Skills, mean ± SD: **G1:** 91.5 ± 14.7 p<0.001 vs. baseline Loneliness, mean ±SD: **G1:** 35.5 ± 14.0 P=0.05 vs. baseline Parent report of ≥ 1 friend that child was pretty close with:

Concomitant therapies, n (%): Report of other treatment(s) during follow-up: **G1:** 16 (66) Individual therapy at follow-up: **G1:** 7 (29) Psychotropic medication use at follow-up: **G1:** 5 (21) Complementary therapies used at follow-up: **G1:** 7 (29) **N at enrollment:** **G1:** 66 **N at follow-up (1-5 years post-treatment):** **G1:** 24	**Age, mean/yrs ±SD:** **G1:** 8.7 ± 1.4 (original) G1: 12.6 (current) **Mental age:** WISC-III verbal IQ, mean ± SD: **G1:** 104.1 ± 17.8 **Sex:** M, n (%): **G1:** 20 (83) F, n (%): **G1:** 4 (17) **Race/ethnicity, n (%):** White **G1:** 16 (67) **SES:** Hollingshead scale, mean ± SD: **G1:** 46.2 ±12.9 **Diagnostic approach:** In Study Diagnostic tool/method: ADOS and ADI-R **Diagnostic category, n (%):** Autism: **G1:** 24 (100) **Other characteristics, n (%):** Wing score, mean ± SD: **G1:** 24.3 ± 8.0	**G1:** 20 (83) Child report of $\geq$ 1 pretty close friend: **G1:** 21 (88) **Problem behavior:** SSRS, Problem Behaviors, mean ± SD: **G1:** 109.3 ± 13.1 p<0.001 vs. baseline **Harms:** NR **Modifiers:** NR

Comments: Original RCT included a wait list control; this paper combines the intervention group with the wait listers who later received the CFT intervention.

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: McNally et al., 2013 [10] **Country:** US **Intervention setting:** Academic (Alliant International University) **Enrollment period:** June 2009 – September 2009 **Funding:** National Foundation for Autism Research; Autism Society of America – San Diego Chapter **Design:** RCT	**Intervention:** Modification of Coping Cat program (cognitive-behavioral therapy, CBT); one 60-90min session per week for 16 weeks **Assessments:** structured interview, parent self-report, child self-report **Groups:** **G1:** cognitive-behavioral therapy **G2:** waitlist **Provider:** Study staff **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** No **Concomitant therapies, n (%):** SSRI: **G1:** 2 (17)	**Inclusion criteria:** • diagnosis of ASD • at least one primary anxiety disorder, e.g., separation anxiety (SAD), generalized anxiety (GAD), or social phobia (SP) • IQ ≥70 • ages 7 – 14 years • English as primary language **Exclusion criteria:** • see inclusion criteria **Age, mean/yrs ± SD:** **G1:** 11.65 ± 1.41 **G2:** 11.02 ± 1.69 **Mental age, mean/yrs (range):** NR **Sex, n (%):** M: **G1:** 12 (100) **G2:** 9 (90) F: **G1:** 0 (0) **G2:** 1 (10) **Race/ethnicity, n (%):** Caucasian: **G1:** 8 (66)	**Commonly occurring co-morbidities:** ADIS-P Interference Ratings: **G1:** 7.00 ± 1.21 **G2:** 7.10 ± 1.10 SCAS total score: **G1:** 27.08 ± 19.75 **G2:** 28.89 ± 17.15 SCAS-P total score: **G1:** 34.92 ± 13.71 **G2:** 32.20 ± 16.54 ADIS-P comorbid diagnoses, mean ± SD: **G1:** 4.00 ± 1.04 **G2:** 3.70 ± 1.06 Baseline anxiety diagnoses, n (%) Separation Anxiety: **G1:** 5 (42) **G2:** SAD: 3 (30) Generalized Anxiety: **G1:** 11 (92) **G2:** 7 (70) Specific phobia: **G1:** 8 (67) **G2:** 7 (70) OCD:	**Commonly occurring co-morbidities, n (%) or mean ± SD:** Anxiety (n, % children no longer meeting criteria for primary anxiety diagnosis) Post-treatment **G1:** 7 (58) **G2:** 0 (0) p=0.003 2-month follow-up **G1:** 4 (36) **G2:** NR ADIS-P Interference Ratings: Post-treatment **G1:** 3.67 ± 2.50 **G2:** 6.50 ± 1.18 Group x time: p<0.01 2-month follow-up **G1:** 4.45 ± 2.54 **G2:** NR SCAS total score, Post-treatment **G1:** 26.75 ± 20.79 **G2:** 36.11 ± 16.46 p=NS 2-month follow-up **G1:** 29.00 ± 22.43

G2: 1 (10)

Anti-psychotic:
G1: 3 (25)
G2: 0 (0)

Stimulant:
G1: 0 (0)
G2: 4 (40)

Psychological/behavioral:
G1: 3 (25)
G2: 2 (20)

School-based:
G1: 5 (42)
G2: 5 (50)

N at enrollment:
G1: 12
G2: 10

N at follow-up:
Post-treatment:
G1: 12
G2: 10

2 month follow-up:
G1: 11
G2: NR

4 (40)Hispanic/Latino:
G1: 2 (17)
G2: 1 (10)

Other/mixed ethnicity:
G1: 2 (17)
G2: 1 (10)

Not reported:
G1: 0 (0)
G2: 4 (40)

SES:
Parent highest education, n (%):
High school graduate:
G1: 4 (33)
G2: 1 (10)
College graduate:
G1: 7 (59)
G2: 6 (60)
Graduate degree:
G1: 1 (8)
G2: 3 (30)

Household income, mean (range): NR
Diagnostic approach:
In Study and Referral
Diagnostic tool/method:
For ASD diagnosis:
Referral: diagnosis of ASD by ADOS (Autism Diagnostic Observation Schedule); ADI-R (Autism Diagnostic Interview-Revised), and expert clinical judgment based on DSM-IV criteria
In Study: ADOS, ADI-R to confirm referral diagnosis

G1: 2 (17)
G2: 0 (0)

Baseline comorbid diagnoses, n (%)
ADHD:
G1: 8 (67)
G2: 8 (80)

Oppositional defiant disorder:
G1: 4 (33)
G2: 5 (50)

Major depressive disorder:
G1: 1 (8)
G2: 0 (0)

Educational/ cognitive/ academic attainment, mean ± SD:
IQ (WASI):
G1: 108.42 ± 17.70
G2: 110.40 ± 17.39

Verbal IQ:
G1: 105.83 ± 17.89
G2: 107.00 ± 15.71

Performance IQ:
G1: 108.58 ± 16.96
G2: 111.90 ± 18.62

G2: NR

SCAS-P total score:
Post-treatment
G1: 20.08 ± 11.34
G2: 31.70 ± 13.36
Group x time: p=0.02

2-month follow-up
G1: 21.64 ± 9.15
G2: NR

ADIS-P comorbid diagnoses:
Post-treatment
G1: 2.42 ± 1.38
G2: 4.00 ± 1.25
Group x time: p<0.001

2-month follow-up
G1: 3.00 ± 1.67
G2: NR

Harms: NR

Modifiers: NR

	For anxiety diagnosis: Referral: ADIS-P (Anxiety Disorders Interview Schedule-Parent Version) In Study: ADIS-P to confirm referral diagnosis **Diagnostic category, n (%):** **G1:** Autism: **G1:** 3 (25) **G2:** 3 (30) Asperger syndrome: **G1:** 9 (75) **G2:** 6 (60) PDD-NOS: **G1:** 0 (0) **G2:** 1 (10) **Other characteristics**, Parent marital status, n (%)**:** Single: **G1:** 1 (8) **G2:** 2 (20) Married/remarried: **G1:** 11 (92) **G2:** 7 (70) Cohabitating: **G1:** 0 (0) **G2:** 1 (10)

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Paynter et al. 2013[11] **Country:** Australia **Intervention setting:** NR **Enrollment period:** NR **Funding:** NR **Design:** Controlled trial	**Intervention:** Thought bubble training including individual training on how to represent beliefs via cartoon bubbles and two dimensional cardboard stimuli; training targeted 5 key Theory of Mind concepts about thinking over the course of 1-3 sessions based on when the participant mastered each key task **Assessments:** observed theory of mind measures **Groups:** **G1:** thought bubble intervention **G2:** control **Provider:** NR **Treatment manual followed:** No **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** No **Co-interventions held stable during treatment:** NR	**Inclusion criteria:** diagnosis of an ASD by qualified clinicians **Exclusion criteria:** NR **Age, mean, months (range):** **G1:** 79.41 ±20.20 **G2:** 94.86 ±28.69 **Mental age, mean ± SD:** Non-verbal mental age (raw Raven's score): **G1:** 5.41 ±2.81 **G2:** 6.14 ±5.46 Verbal mental age, months (Peabody Picture Vocabulary Test): **G1:** 70.06 ±21.31 **G2:** 81.14 ±33.99 **Sex, n (%):** M: 21 (87.5) F: 3 (12.5) **Race/ethnicity, n (%):** NR **SES:** NR **Diagnostic approach:** Referral Diagnostic tool/method: DSM-IV	**Social skills, mean ± SD:** Sally-Ann false belief (out of 2): **G1:** 0.29 ±0.47 **G2:** 0.71 ±0.76 Total false belief (out of 4): **G1:** 1.18 ±0.73 **G2:** 1.86 ±1.22 Total Theory of Mind scale (out of 5): **G1:** 2.00 ±0.94 **G2:** 2.71 ±1.11	**Social skills:** Sally-Ann false belief (out of 2): Immediate post-assessment: **G1:** 1.53 ±0.80 p<0.01 vs. baseline **G2:** 0.57 ±0.79 p=NS vs. baseline 3 week follow-up: **G1:** 1.56 ±0.73 p=0.02 vs. baseline **G2:** 1.67 ±0.82 p=NS vs. baseline Total false belief: Immediate post-assessment: **G1:** 2.94 ±1.25 p<0.01 vs. baseline **G2:** 1.43 ±1.40 p=NS vs. baseline 3 week follow-up: **G1:** 3.44 ±0.88 p<0.01 vs. baseline **G2:** 3.00 ±1.55 p=NS vs. baseline Total Theory of Mind scale: Immediate post-assessment: **G1:** 3.06 ±1.00 p<0.01 vs. baseline **G2:** 2.86 ±1.68

	Diagnostic category, n (%):	p=NS vs. baseline
Concomitant therapies, n (%): NR	NR	
	Other characteristics, n (%):	3 week follow-up:
N at enrollment:	Syntactic language skill, raw	**G1:** 4.11 ± 0.60
G1: 17	TROG-2, mean ± SD:	p<0.01 vs. baseline
G2: 7	**G1:** 5.41 ± 2.81	**G2:** 3.33 ±1.51
	G2: 6.14 ± 5.46	p=NS vs. baseline
N at final follow-up (mean 23 days after immediate post assessment):		**Harms:** NR
G1: 9		**Modifiers:** NR
G2: 6		

Comments: G1 at final follow-up is calculated to be 10 in the text, and 9 in the table note. Study only includes within-group statistical comparisons; no between-group analysis reported

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Perry et al. 2013[12] **Country:** Canada **Intervention setting:** **Treatment centers in the community, and children's homes** **Enrollment period:** NR **Funding:** York University **Design:** Retrospective chart review Note: See study reporting on this population[13] in 2011 AHRQ review; table includes data from comparative study only—related studies include Shine 2010,[14] Freeman 2010,[15] Perry 2011,[16] Flanagan 2012[17]	**Intervention:** Intensive behavioral Intervention (IBI) 20 hours/week **Assessments:** Cognitive and adaptive outcomes **Groups:** **G1a:** Younger age group (2-5 years) **G1b:** Older age group (6-14 years) **Provider:** • Psychologists and psychometrists **Treatment manual followed:** Yes **Defined protocol followed:** NR **Measure of treatment fidelity reported:** NR **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR N at enrollment: **G1a:** 60 **G1b:** 60	**Inclusion criteria:** Children (from the community effectiveness program conducted in Canada who had IBI) matched on their initial IQ prior to the intervention. **Exclusion criteria:** see inclusion **Age, mean/yrs (range):** **G1a:** 4.26 ± 1.09 (2.08–5.92) **G1b:** 7.45 ± 1.87 (6.00–13.58) **Mental age, mean/yrs (range):** **G1a:** 1.67 ±.93 (.25–5.64) **G1b:** 3.02 ± 1.57 (.71–7.45) **Sex:** NR **Race/ethnicity, n (%):** NR **SES:** NR **Diagnostic approach:** NR Diagnostic tool/method: NR **Diagnostic category, n (%):** Autism: 100 **Other characteristics**: **Duration IBI (months)** mean ± SD (range)	**IQ, mean ± SD:** **G1a:** 43.47 ± 21.26 **G1b:** 42.68 ± 21.38 **Cognitive rate:** G1a: .42 ± .21 G1b: .43 ± .21 **Adaptive behavior** VABS composite standard score: **G1a**: 55.89 ± 9.11 **G1b:** 53.63 ± 12.63 Adaptive rate **G1a:** .34 ±.14 **G1b:** .34 ± .14	**IQ, mean ± SD:** **G1a:** 60.11 ± 31.39 **G1b:** 44.44 ± 21.18 p <.001 **Cognitive rate:** G1a:1.09 ± .92 G1b:.47 ± .65 p<.001 **Adaptive behavior** VABS composite standard score: **G1a:** 59.52 ± 17.40 **G1b:** 58.88 ± 13.81 p=.47 **Adaptive rate** **G1a:**.86 ±.81 **G1b**: .62 ±.76 p=.09 **Harms:** NR **Modifiers:** NR

	G1a: 20.53 ± 8.99 (10–42) **G1b**: 20.20 ± 8.23 (10–41)
N at follow-up: **G1a:** 60 **G1b:** 60	

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Peters-Scheffer et al. 2013 [18] **Country:** Netherlands **Intervention setting:** School **Enrollment period:** 2007-2011 **Funding:** Stichting De Driestroom at Elst, The Netherlands **Design:** nRCT	**Intervention:** School-based treatment based on ABA principles provided one-on-one for 4–10 hours/week over 2 years (1 year for 9 of the participants) Children in the control group received standard care **Assessments**: Parent, teacher & staff report **Groups:** **G1:** Low intensity behavioral treatment (LIBT) **G2:** Treatment as usual **Provider:** **G1**: university-student therapists, pre-school staff and teachers, and MScS in psychology or special education **G2**: Clinical psychologist or special educator (MSc) **Treatment manual followed:** Yes **Defined protocol followed:** Yes	**Inclusion criteria:** • Previous DSM-IV or ICD-10 diagnosis of intellectual disability (ID) and autism or Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) by a clinician who was independent of the study **Exclusion criteria:** See inclusion **Age, mean (SD) /months / range:** **G1**+**G2**: 62.52 months ± 16.96 **Mental age, mean/yrs (range):** NR **Sex, n (%):** M **G1**: 18 (90) **G2**: 18 (90) F **G1**: 2 (10) **G2**: 2 (10) **Race/ethnicity, n (%):** NR	**Mean (SD)** Cognitive functioning Developmental age, in months **G1**:23.34 (7.32) **G2**:23.43 (6.34) Ratio IQ **G1**:40.66 (20.07) **G2**:40.14 (18.27) Visual reception **G1**:26.30 (8.47) **G2**:26.95 (5.46) Fine motor **G1**:27.50 (6.20) **G2**:27.65 (6.43) Receptive language **G1**:19.75 (9.26) **G2**:20.15 (8.57) Expressive language **G1**:19.80 (8.32) **G2**:18.95 (9.12) Adaptive behavior Composite **G1**:18.35 (3.41) **G2**:19.82 (4.71) Communication **G1**:23.94 (7.64) **G2**:24.35 (9.80) Daily living skills	**Mean (SD):** **At 24 months**: Cognitive functioning Developmental age **G1**:39.70 (11.99) **G2**:32.44 (11.55) d=1.09, p=0.001 Ratio IQ **G1**:48.12 (19.71) **G2**:39.42 (19.89), d=0.40, p<0.001 Visual reception **G1**:44.50 (14.39) **G2**:36.10 (11.99) Fine motor **G1**:44.45 (14.66) **G2**:34.65 (10.37) Receptive language **G1**:36.55 (11.63) **G2**:30.80 (13.27), d=1.22 Expressive language **G1**:33.30 (12.02) **G2**:28.20 (14.03), d=0.40 Adaptive behavior Composite **G1**:37.35 (13.05) **G2**:26.71 (9.84), d=1.74, p<0.001

Measure of treatment fidelity reported: yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1**: 23 **G2**: 20 **N at follow-up:** **G1**: 20 **G2**: 20	**SES:** NR **Diagnostic approach:** Referral & in study Diagnostic tool/method: ADOS, CARS **Diagnostic category, n (%):** **G1**: Autism:18, PDD-NOS:2 **G2**:Autism:19, PDD-NOS:1 **Other characteristics**, Mean (SD)/range: No major medical diagnoses reported **G1**: Received on average 4.98 h / week of treatment (SD = 1.45; range: 1.32–7.11). **G1:** 9 children received only 1 year of behavioral intervention	**G1**:20.82 (6.12) **G2**:23.00 (9.26) Socialization **G1**:19.76 (3.36) **G2**:22.88 (5.79) Social emotional development Interpersonal relationships **G1**:14.44 (5.19) **G2**:16.94 (6.50) Play and leisure time **G1**:15.38 (5.82) **G2**:18.75 (5.87) Early social communication Initiating joint attention **G1**:7.43 (6.02) **G2**:7.64 (9.52) Responding to joint attention **G1**:96.60 (62.68) **G2**:118.80 (58.92) Initiating requests **G1**:24.64 (4.77) **G2**:25.71 (4.50) Responding to requests **G1**:69.16 (35.05) **G2**:70.07 (22.53) Initiating social interaction **G1**:3.21 (1.48)	Communication **G1**:43.71 (17.68) **G2**:32.35 (14.56), d=1.41 Daily living skills **G1**:39.29 (11.13) **G2**:29.71 (12.15), d=1.62 Socialization **G1**:39.35 (10.58) **G2**:29.71 (9.99), d=2.61 Social emotional development Interpersonal relationships **G1**:29.25 (9.60) **G2**:22.31 (6.59), d=1.57, p=0.001 Play and leisure time **G1**:36.19 (12.97) **G2**:25.31 (7.58), d=2.42 Early social communication Initiating joint attention **G1**:11.50 (7.62) **G2**:11.21 (7.75) Responding to joint attention **G1**:84.70 (73.19) **G2**:95.31 (83.88) Initiating requests **G1**:26.36 (5.21

	G2:2.07 (1.49) Responding to social interaction **G1**:7.50 (2.74) **G2**:7.00 (2.91) Receptive language **G1**:25.00 (4.48) **G2**:24.70 (3.21) Expressive language **G1**:18.35 (6.72) **G2**:17.65 (6.64) Autism; total score ADOS **G1**:17.00 (3.28) **G2**:15.45 (2.72) Autism; total score CARS **G1**:43.84 (4.30) **G2**:40.79 (6.20) Emotional/behavioral problems **G1**:67.00 (26.38) **G2**:68.29 (33.47) Behavioral flexibility **G1**:10.00 (6.96) **G2**:11.29 (6.64) Maternal stress **G1**:78.38 (28.75) **G2**:95.08 (30.31)	**G2**:26.86 (4.75), P=ns Responding to requests **G1**:88.21 (17.60) **G2**:89.33 (15.90), P=ns Initiating social interaction **G1**:3.79 (2.36) **G2**:3.29 (2.02), p=ns Responding to social interaction **G1**:9.79 (3.98) **G2**:9.07 (3.45), p=ns Receptive language **G1**:34.30 (10.54) **G2**:29.30 (7.42) Expressive language **G1**:34.15 (14.54) **G2**:30.80 (15.12), d=0.40 Autism; total score ADOS **G1**:12.05 (5.41) **G2**:15.15 (4.26), d=1.51 Autism; total score CARS **G1**:34.89 (3.62) **G2**:39.95 (4.62), d=1.50 Emotional/behavioral problems **G1**:52.86 (23.52) **G2**:65.21 (32.62)

	p = .16 Behavioral flexibility **G1**:9.14 (4.59) **G2**:11.14 (6.49) **G1** vs. **G2**, p=ns Maternal stress **G1**:71.38 (30.76) **G2**:87.08 (31.43), d=0.33, p=0.29 **Harms:** NR **Modifiers:** NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Reed et al. 2013[19] **Country:** UK **Intervention setting:** Home **Enrollment period:** NR **Funding:** NR **Design:** Prospective Cohort	**Intervention:** Barnet Early Autism Model (BEAM)- home based program delivered by trained facilitators under direction of an advisory teacher; individualized program for each participant and daily visits by facilitator Portage- a home-based teaching program; supervised by trained Portage worker who visits parents once a week; training sessions last about 40-60 min/day **Assessments:** observed, parent report **Groups:** **G1:** BEAM **G2:** Portage **Provider:** • Trained facilitators **Treatment manual followed:** Yes **Defined protocol followed:** No **Measure of treatment fidelity reported:** No	**Inclusion criteria:** diagnosis of autism or PDD-NOS made by pediatrician independent of the study participants had to be at start of their intervention and not receiving any other major intervention for duration of study < 5 years old **Exclusion criteria:** See above Age, mean months ± SD: **G1:** 43.6 ± 5.8 **G2:** 40.1 ± 8.3 **Mental age, mean/yrs:** NR **Sex:** NR **Race/ethnicity, n (%):** NR **SES:** Maternal education: NR Household income, mean (range): NR **Diagnostic approach:** Referral Diagnostic tool/method: DSM-IV **Diagnostic category, n (%):** NR	**Global Rating of Severity** Autism Behavior Checklist, mean ± SD: **G1:** 59.8 ± 16.1 **G2:** 58.8 ± 23.8 Intellectual functioning (Leiter overall): **G1:** 83.3 ± 23.7 **G2:** 72.6 ± 12.5 Adaptive behavior (Vineland composite) **G1:** 70.2 ± 4.1 **G2:** 68.6 ± 6.0 Language (Peabody overall) **G1:** 59.9 ± 19.5 **G2:** 55.3 ± 14.7 Behavior Problems (DBC total) **G1:** 41.1 ± 11.6 **G2:** 35.8 ± 12.8	**Global Rating of Severity** Autism Behavior Checklist, mean ± SD No change between groups at follow-up **Communication/ language:** Mean group change scores were significantly different for G1 vs G2; F(1,30)=5.83, p<0.05 **Adaptive behavior:** Mean group change scores were significantly different for G1 vs G2; F(1,30)=90.27, p<0.001 **Educational/ cognitive/ academic attainment:** No change between groups at follow-up **Harms:** NR **Modifiers:** No significant relationship between baseline parenting stress and follow-up child intellectual functioning, r(30) = - 0.217, p > 0.10 Statistically significant negative relationships between parenting stress at baseline and

	Co-interventions held stable during treatment: Participants could not receive any other "major intervention" during the study **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 16 **G2:** 16 **N at follow-up:** **G1:** 16 **G2:** 16	**Hours per week of intervention** **G1:** 6.4 ± 2.1 **G2:** 8.5 ± 6.8	followup linguistic functioning, r(30) = -0.355, p < 0.05

Comments: Outcome measures were reported in figure format only (results reported as change from baseline to follow-up).

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Schertz et al. 2013[20] **Country:** US **Intervention setting:** home **Enrollment period:** NR **Funding:** Autism Speaks **Design:** RCT	**Intervention:** Joint attention mediated learning (JAML), with weekly home visits to parents and child conducted by intervention coordinators Participants spent a mean of 7 months (range 4-12 months) in either intervention or control **Assessments:** observed, parent report **Groups:** **G1:** JAML **G2:** Treatment as usual **Provider:** • 2 interventionists with master's degrees in early childhood education and 1 with an Ed.S. degree in counseling **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes	**Inclusion criteria:** scores above designated cut-off levels on ADOS (4 on the Communication of Section 1 and 4 on the Social section) absence of joint attention during interaction with parents based on direct observation chronological age < 30 months at onset of intervention **Exclusion criteria:** confounding diagnosis (e.g. failure to thrive, premature birth > 6 weeks, other developmental disabilities such as Down syndrome) **Age, mean months ± SD:** **G1:** 24.6 ± 4.0 **G2:** 27.5 ± 3.4 **Mental age, mean months ± SD:** NR **Sex:** NR **Race/ethnicity, n (%):** NR **SES:** Participating parent education, mean years ±	**Communication/ language:** Focusing on faces, mean ± SD: **G1:** 6.75 ± 5.18 **G2:** 6.28 ± 5.14 Turn-Taking, mean ± SD: **G1:** 1.67 ± 1.66 **G2:** 1.94 ± 2.74 Responding to Joint Attention, mean ± SD: **G1:** 0.06 ± 0.13 **G2:** 0.25 ± 0.32 Initiating Joint Attention, mean ± SD: **G1:** 0.14 ± 0.26 **G2:** 0.19 ± 0.33 VABS, communication, mean ± SD: **G1:** 63.73 ± 9.42 **G2:** 69.55 ± 10.73 MSEL, receptive language, mean ± SD: **G1:** 21.0 ± 2.0 **G2:** 25.9 ± 9.1 MSEL, expressive language**,** mean ± SD: **G1:** 24.6 ± 6.7 **G2:** 24.8 ± 6.9	**Communication/ language:** Focusing on faces, mean ± SD: **G1:** 14.85 ± 8.99 **G2:** 7.33 ± 6.81 Time x group interaction: p=NS Turn-Taking, mean ± SD: **G1:** 2.47 ± 2.17 **G2:** 2.85 ± 3.06 Time x group interaction: p=NS Responding to Joint Attention, mean ± SD: **G1:** 5.61 ± 4.77 **G2:** 0.75 ± 1.18 Time x group interaction: p=NS Initiating Joint Attention, mean ± SD: **G1:** 4.40 ± 4.48 **G2:** 2.40 ± 3.72 Time x group interaction: p=NS VABS, communication, mean ± SD: **G1:** 75.90 ± 13.51 **G2:** 68.08 ± 19.77 Time x group interaction: p<0.05 MSEL, receptive language, mean ± SD:

Co-interventions held stable during treatment: No **Concomitant therapies, n (%):** Weekly hours of intervention, mean ± SD (G1 includes JAML hours): Indiana: **G1:** 7.41 ± 4.67 **G2:** 12.82 ± 14.06 Kansas **G1:** 17.88 ± 9.06 **G2:** 21.35 ± 11.51 North Carolina: **G1:** 2.89 ± 1.25 **G2:** 6.25 ± 6.49 **N at enrollment:** **G1:** 11 **G2:** 12 **N at follow-up:** **G1:** 11 **G2:** 12	SD: **G1:** 14.4 ± 2.3 **G2:** 15.8 ± 2.3 Household income, mean (range): NR **Diagnostic approach:** In Study Diagnostic tool/method: initial screening with M-CHAT, followed by ADOS **Diagnostic category, n (%):** NR **Other characteristics, mean ± SD:** ADOS, Communication: **G1:** 6.4 ± 1.1 **G2:** 6.0 ± 1.8 ADOS, Social: **G1:** 11.0 ± 2.6 **G2:** 10.8 ± 1.8 ADOS, Play: **G1:** 3.7 ± 0.8 **G2:** 2.8 ± 1.5 ADOS, Stereotypy: **G1:** 1.0 ± 1.1 **G2:** 1.7 ± 1.8	**G1:** 28.27 ± 11.35 **G2:** 25.33 ± 8.52 Time x group interaction: p<0.05 MSEL, expressive language, mean ± SD: **G1:** 33.27 ± 15.79 **G2:** 27.17 ± 11.21 Time x group interaction: p=NS **Harms:** NR **Modifiers:** NR

Comments: outcome data is reported as a composite (mean) of 2 follow-up scoring sessions (4 and 8 weeks after intervention ceased)

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Schreibman et al., 2013 [21] **Country:** US **Intervention setting:** Laboratory and home **Enrollment period:** NR **Funding:** USPHS grants from NIMH **Design:** RCT	**Intervention:** Picture Exchange Communication System (PECS) Pivotal Response Training (PRT) For the first 15 weeks parent and children participated in 2 weekly, 2 hour parent education sessions in the laboratory and children received additional five 2-hour sessions at home. Following 8 weeks of one 2-hour parent education session per week and two 2-hour/week home sessions. Children received average of 247 hours of treatment during the study (range 181-263) **Assessments:** observed, parent report **Groups:** **G1:** PECS **G2:** PRT **Provider:** • Undergraduate student therapists trained in PECS and PRT.	**Inclusion criteria:** diagnosis of autistic disorder confirmed by ADI-R and ADOS-G < 48 months old No more than 9 intelligible words Absence of evidence for diagnosis of primary mental retardation, neurological pathology or major sensory impairment Absence of prior treatment involving PECS or PRT Parental willingness to participate in training and to refrain from non-assigned treatment for duration of the study **Exclusion criteria:** See above **Age, mean months ± SD**: **G1:** 28.9 ± 4.2 **G2:** 29.5 ± 6.9 **Mental age, mean/yrs:** NR **Sex:** M, n (%) **G1:** 16 (84.2) **G2:** 18 (90) F, n (%) **G1:** 3 (15.8) **G2:** 2 (10)	**Communication/ language:** Mullen Scales of Early Learning, mean ± SD (n=38): Expressive communication (n=38) **G1:** 20.3 ± 3.2 **G2:** 18.5 ± 2.8 MacArthur CDI, mean ± SD (n=35): Words produced **G1:** 5.3 ± 9.4 **G2:** 11.9 ± 20.5 VABS, mean ± SD (n=35): Communication **G1:** 62.2 ± 4.7 **G2:** 60.2 ± 7.5	**Communication/ language:** Mullen Scales of Early Learning, mean ± SD (n=38): Expressive communication **G1:** 28.7 ± 16.5 **G2:** 23.7 ±11.2 Group x time interaction: p=NS MacArthur CDI, mean ± SD (n=35): Words produced **G1:** 129.8 ± 117.9 **G2:** 113.3 ± 108.3 Group x time interaction: p=NS VABS, mean ± SD: Communication **G1:** 68.4 ± 14.5 **G2:** 62.6 ± 12.7 Group x time interaction: p=NS **Harms:** NR **Modifiers:** NR

Parent educators were doctoral students	**Race/ethnicity, n (%):** NR
Treatment manual followed: Yes	**SES:** Maternal education: NR
Defined protocol followed: Yes	Household income, mean (range): NR
Measure of treatment fidelity reported: Yes	**Diagnostic approach:** In Study/Referral
Co-interventions held stable during treatment: NR	Diagnostic tool/method: ADI-R, ADOS-G
Concomitant therapies, hours/week: Speech therapy and occupational therapy: **G1:** .94 **G2**: .94	**Diagnostic category, n (%):** Autism: 100 **Other characteristics, n (%):** Word use, n (%) No words **G1:** 11 (57.9) **G2:** 10 (50)
Preschool/daycare: **G1**:.3 **G2:** 1.5	1-10 words **G1:** 8 (42.1) **G2:** 10 (50)
In-home early intervention **G1:** 2.4 **G2:** 3.4 (No significant differences in the amount of other treatments received)	Cognitive functioning, n (%) Low **G1:** 8 (42.1) **G2:** 12 (60)
N at enrollment: **G1:** 19 **G2:** 20	High **G1:** 11 (57.9) **G2:** 8 (40)
N at follow-up: **G1:** 19 **G2:** 20	Parent satisfaction with intervention results

*some loss to followup but group not clearly reported	(overall): Mean rating: **G1**: 6.0 **G2**: 5.7 Difficulty of the strategy: **G1**: 4.6 **G2:** 5.6 **G1 vs G2**: p=0.005

Table C-1. Evidence table, continued Study Description	**Intervention**	**Inclusion/ Exclusion Criteria/ Population**	**Baseline Measures**	**Outcomes**
Author: Sharp et al. 2013 [22] **Country:** US **Intervention setting:** Home **Enrollment period:** NR **Funding:** 2008 Applied Research Grant sponsored by the Organization for Autism Research **Design:** RCT	**Intervention:** Autism Meal Plan involving eight, 1-h-long parent-training group sessions covering topics as general behavior management strategies applied during meals, specific interventions for feeding problems associated with ASD and strategies for promoting self-feeding Waitlist control group received email correspondence involving handouts on nonfeeding-related topics with limited behavioral content subsequently offered the educational curriculum **Assessments:** Social Responsiveness Scale (SRS)–parent report form. Brief Autism Mealtime Behavior Inventory (BAMBI) Parenting Stress Index–short form (PSI-SF) Food Preference Inventory (FPI) Social validity and parent perception of improvement	**Inclusion criteria:** ASD diagnosis among children aged between 3 and 8 years a total SRS score in the mild, moderate, or severe range (total standard score (T-score) > 60) **Exclusion criteria:** See inclusion **Age, mean ± SD /months /range:** **G1:** 70.8 ± 20.5/36–104 **G2:** 64.8 ± 6.9/45–94 **Mental age, mean/yrs (range):** NR **Sex , n(%):** G1+G2: M: 8 (80) F: 7 (78) **Race/ethnicity, n (%):** NR **SES:** NR **Diagnostic approach:** In Study Diagnostic tool/method: Social Responsiveness Scale (SRS) parent report form **Diagnostic category, (%):** ASD : 100	**Mean ± SD** BAMBI total score **G1:**51. ± 1 7.1 **G2:**52. ± 1 7.8 BAMBI limited variety **G1:**28.2 ± 5.1 **G2:**28.2 ± 5.1 BAMBI food refusal **G1:**12.9 ± 3.5 **G2:**11.9 ± 3.3 BAMBI autism features **G1:**10.0 ± 2.1 **G2:**12.0 ± 3.54 FPI selectivity score **G1:**32.6 ± 22.3 **G2:**37.2 ± 17.8	**Mean ± SD** BAMBI total score **G1:**47.2 ± 9.6 **G2:**47.2 ± 12.6 p=.79 (F=.07) BAMBI limited variety **G1:**26.0 ± 5.2 **G2:**26.8 ± 6.6 p=.55 (F=.36) BAMBI food refusal **G1:**12.6 ± 4.1 **G2:**11.0 ± 3.0 p=.51 (F=.46) BAMBI autism features **G1:**8.6 ± 2.0 **G2:**9.5 ± 3.6 p=.57 (F=.34) FPI selectivity score **G1:**38.8 ± 27.5 **G2:**37.2 ± 25.9 p=.21 (F=1.7) **Harms:** NR **Modifiers:** NR

Groups: **G1:** Autism Meal Plan **G2:** Wait-list control **Provider:** • Behavioral psychologist and a post-doc psychology fellow **Treatment manual followed:** yes **Defined protocol followed:** yes **Measure of treatment fidelity reported:** yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 15 **G2:** 15 **N at follow-up:** **G1:** 10 **G2:** 9	**Other characteristics**, Mean ± SD/range: SRS total score **G1:**82.4 ± 8.4/70–91 **G2:**80.6 ± 7.9/68–91	

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Siller et al. 2013[23] **Country:** US **Intervention setting:** home **Enrollment period:** 2004- to 2007 **Funding:** National Institute of Child Health and Development, M.I.N.D. Institute Research Program, and PSC-CUNY grants **Design:** RCT	**Intervention:** Focused Playtime Intervention (FPI)- a parent education program involving 12 in-home training sessions (once/week for 12 weeks, 90 min each) follows standardized treatment manual uses capacity building approach to promote coordinated toy play between parent and child. Parents in both groups received monthly sessions to enhance parent advocacy in multiple formats including workbook, teaching, video and demonstrations. **Assessments:** Mullen Scales of Early Learning (MSEL); Early Social Communication Scale, Insightfulness Assessment (IA); observations of mother-child interaction; medical history questionnaire; survey of non-project services; ADI-R and ADOS Baseline assessment (T1) conducted in three	**Inclusion criteria:** • < 6 years old • previously diagnosed with ASD • limited or no use of spoken language (generally < 25 words and no phrases) • mother fluent in English and willing/available to participate in all assessment and treatment sessions • families lived reasonable distance from research lab (generally < 90 min) **Exclusion criteria:** known genetic diagnosis including Fragile X, tuberous sclerosis or Rett syndrome. **Age, mean/mos ± SD (range):** **G1:** 58.3 ± 12.7 (33-82) **G2:** 55.9 ± 11.9 (32-76) **Mental age, mean/yrs (range):** NR **Sex:** M, 64 (91.4%):	**Language/communication:** Mullen scales of early learning, mean ± SD (range): Fine motor **G1:** 28.6 ± 10.4 (12-55) **G2:** 28.3 ± 11.8 (10-59) Visual reception **G1:** 26.6 ± 9.4 (11-50) **G2:** 24.6 ± 11.2 (1-11) Receptive language **G1:** 17.5 ± 8.0 (5-36) **G2:** 16.5 ± 8.-0 (1-33) Expressive language **G1:** 16.5 ± 9.8 (4-36) **G2:** 15.1 ± 8.2 (4-37) ADOS Social affect total **G1:** 14.7 ± 3.3 (6-20) **G2:** 14.8 ± 3.4 (4-20) Restricted and repetitive behavior **G1:** 4.9 ± 2.0 (0-8) **G2:** 5.2 ± 2.2 (0-8) Total **G1:** 19.6 ± 4.1 (9-26) **G2:** 20.0 ± 4.2 (7-26) ESCS Response to joint attention	**Language/communication:** Maternal synchronization, mean ± SE Time 2 **G1:** 0.72 ± 0.04 **G2:** 0.61 ± 0.04 T1 to T2 **G1:** 0.06 ± 0.04 **G2: -**0.06 ± 0.04 Expressive language, mean ± SE T2 **G1:** 4.02 ± 0.16 **G2:** 3.90 ± 0.17 T3 **G1:** 4.38 ± 0.17 **G2:** 4.17 ± 0.17 T1 to T3 **G1:** 0.08 ± 0.09 **G2: -**0.09 ± 0.10 **Harms:** NR **Modifiers** Children with baseline expressive language abilities < 11.3 months showed larger gains in expressive language when randomized to G1

sessions (two at research lab and one at home), at exit (T2), Follow up approximately 12 mos after exit (T3). **Groups:** **G1:** intervention **G2:** control **Provider:** Trained graduate and postdoctoral students in developmental psychology and counseling **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** Yes **Concomitant therapies, n (%):** Medication to control seizures (n=3) **N at enrollment:** **G1:** 36 **G2:** 34 **N at follow-up:** **G1:** 31 **G2:** 31	F, 6 (8.6%): **Race/ethnicity, n (%):** Hispanic/Latino **G1:** 17 (47.2) **G2:** 14 (41.2) White **G1:** 8 (22.2) **G2:** 6 (17.6) Asian **G1:** 4 (11.1) **G2:** 9 (26.5) Black **G1:** 3 (8.3) **G2:** 2 (5.9) Mixed **G1:** 4 (11.1) **G2:** 3 (8.8) **SES:** Maternal education, n (%): 10th-11th grade **G1:** 1 (2.8) **G2:** 0 High school graduate **G1:** 7 (19.4) **G2:** 2 (5.9) Partial college **G1:** 13 (36.1) **G2:** 13 (38.2) Standard college graduate **G1:** 8 (22.2) **G2:** 10 (29.4)	**G1:** 47.0 ± 24.1 (8-100) **G2:** 39.6 ± 24.1 (5-88) Non-project services Twelve months prior to intake **G1:** 8.8 ± 10.4 (0-44) n=36 **G2:** 8.8 ± 10.9 (0-46) n=32 Between intake and exit **G1:** 12.4 ± 11.0 (0-40) n=34 **G2:** 12.1 ± 10.2 (0-44) n=30 Between exit and follow up **G1:** 12.5 ± 11.7 (0-36) n=27 **G2:** 13.7 ± 9.5 (0-37) n=27 School programs Twelve months prior to intake **G1:** 11.5 ± 6.6 (0-29) n=36 **G2:** 12.6 ± 7.1 (0-25) n=32 Between intake and exit **G1:** 14.6 ± 8.8 (0-30) n=34 **G2:** 14.8 ± 5.5 (1-28) n=30 Between exit and follow up **G1:** 17.1 ± 9.0 (0-29) n=27 **G2:** 16.2 ± 6.9 (0-25) n=27 Maternal synchronization, mean ± SE **G1:** 0.57 ± 0.03 **G2:** 0.63 ± 0.03 Expressive language, mean ± SE

	Graduate degree **G1:** 7 (19.4) **G2:** 9 (26.5) Household income, mean (range): Below $19,999 **G1:** 6 (16.7) **G2:** 2 (5.9) $20,000-$39,999 **G1:** 9 (25.0) **G2:** 4 (11.8) $40,000-$74,999 **G1:** 7 (19.4) **G2:** 10 (29.4) Above $74,999 **G1:** 14 (38.9) **G2:** 18 (52.9) **Diagnostic approach:** Referral Diagnostic tool/method: ADI-R and ADOS **Diagnostic category,n (%):** NR **Other characteristics, n (%):** NR	**G1:** 3.70 ± 0.16 **G2:** 3.75 ± 0.16

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Storch et al. 2013[24] **Country:** USA **Intervention setting:** University-based mental health clinic **Enrollment period:** NR **Funding:** National Institutes of Health (NIH) Centers for Disease Control (CDC) Agency for Healthcare Research and Quality National Alliance for Research on Schizophrenia and Affective Disorders (NARSAD) International Obsessive-Compulsive Disorder Foundation (IOCDF)	**Intervention:** Cognitive-behavioral therapy (CBT),16 weekly sessions with 3 month follow-up **Assessments:** Clinician-rated measurements PARS ADIS-C/P Clinical Global Impression (CGI)-Severity and Improvement Parent-rated measures Child Behavior Checklist (CBCL) Columbia Impairment Scale-Parent Version (CIS-P) Multidimensional Anxiety Scale for Children-Parent Version (MASC-P) Social Responsiveness Scale (SRS) SACA Child-Rated Measures Revised Children's Manifest Anxiety Scale (RCMAS) **Groups:** **G1:** CBT **G2:** standard care	**Inclusion criteria:** • diagnosis of autism, Asperger's syndrome, or PDD-NOS diagnosed by ADI-R and ADOS • primary diagnosis of separation anxiety disorder (SAD), social phobia, generalized anxiety disorder (GAD), or obsessive compulsive disorder (OCD) • age 7-11 years old **Exclusion criteria:** • full scale or verbal comprehension IQ < 70 on a standardized test • concurrent participation in psychosocial interventions • suicidality or suicidal behavior in the last six months • diagnosis of BPAD or psychotic disorder **Age, mean/yrs ± SD:** **G1:** 8.83 ± 1.31 **G2:** 8.95 ± 1.40	**Overall ratings:** **Global Rating of Severity, mean ± SD:** CGI-Severity**:** **G1:** 3.50 ± 0.72 **G2:** 4.00 ± 0.63 **Social skills:** SRS total, mean ± SD: **G1:** 100.83 ± 25.10 **G2:** 110.14 ± 22.41 SRS, awareness, mean ± SD: **G1:** 12.67 ± 3.94 **G2:** 12.67 ± 3.14 SRS, motivation, mean ± SD: **G1:** 14.33 ± 4.86 **G2:** 19.10 ± 5.37 SRS, mannerisms, mean ± SD: **G1:** 19.63 ± 5.86 **G2:** 20.62 ± 6.75 **Communication/ language:** SRS, communication, mean ± SD: **G1:** 33.83 ± 9.31 **G2:** 36.67 ± 7.83 **Problem behavior:** CIS-P, mean ± SD: **G1:** 21.13 ± 9.51	**Overall ratings:** **Global Rating of Severity, mean ± SD:** CGI-Severity**:** **G1:** 2.67 ± 0.48 **G2:** 3.57 ± 0.87 p < 0.01 3-month follow-up **G1:** 2.73 ± 0.96 p < 0.01 vs. baseline **Social skills:** SRS total, mean ± SD: **G1:** 88.88 ± 19.85 **G2:** 106.19 ± 26.00 p < 0.05 3-month follow-up **G1:** 93.33 ± 27.64 p=NS SRS, awareness, mean ± SD: **G1:** 12.04 ± 2.63 **G2:** 12.57 ± 3.67 p=NS 3-month follow-up **G1:** 12.00 ± 3.32 p < 0.05 vs. baseline SRS, motivation, mean ± SD: **G1:** 12.46 ± 3.91 **G2:** 17.57 ± 5.64 p=NS 3-month follow-up **G1:** 14.00 ± 6.65 p=NS vs. baseline

Tourette Syndrome Association Janssen Pharmaceuticals **Design:** RCT	**Provider:** Therapists Parents Self-therapy **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** SSRI: **G1:** 6 (25) **G2:** 4 (19) Atypical antipsychotic: **G1:** 2 (8.3) **G2:** 5 (23.8) Stimulant, atomoxetine, or guanfacine: **G1:** 7 (29.2) **G2:** 7 (33.3) Benzodiazepine: **G1:** 0 **G2:** 1 (4.8) **N at enrollment:** **G1:** 24 **G2:** 21	**Mental age, mean/yrs (range):** NR **Sex:** M, n (%): **G1**: 19 (79.2) **G2**: 17 (81) F, n (%): **G1**: 5 (20.8) **G2**: 4 (19) **Race/ethnicity, n (%):** **G1**: White: **G1**: 22 (91.7) **G2**: 16 (76.2) Asian/Pacific: **G1**: 1 (4.2) **G2:** 1 (4.8) Latino/Latina: **G1**: 1 (4.2) **G2**: 4 (19) **SES:** **Household income, n (%)**: < $40,000: **G1**: 1 (4.2) **G2**: 3 (14.3) Between $40,001 and $90,000: **G1:** 6 (25) **G2:** 6 (28.6) >$90,000: **G1:** 17 (70.8) **G2**: 11 (52.4)	**G2:** 24.71 ± 10.35 CBCL, internalizing, mean ± SD: **G1:** 18.08 ± 9.09 **G2:** 23.71 ± 7.99 CBCL, externalizing, mean ± SD: **G1:** 13.67 ± 9.58 **G2:** 20.10 ± 14.25 **Anxiety:** PARS, mean ± SD: **G1:** 16.33 ± 1.93 **G2:** 17.62 ± 2.04 ADIS Highest CSR, mean ± SD**:** **G1:** 5.42 ± 0.72 **G2:** 5.62 ± 0.92 MASC-P, mean ± SD**:** **G1:** 58.58 ± 13.15 **G2:** 63.19 ± 10.51 RCMAS, dysphoric mood, mean ± SD: **G1:** 2.88 ± 2.01 **G2:** 3.33 ± 1.85 RCMAS, oversensitivity, mean ± SD: **G1:** 2.21 ± 2.13 **G2:** 3.38 ± 2.01 RCMAS, worry, mean ± SD: **G1:** 3.67 ± 2.35 **G2:** 4.05 ± 2.27 RCMAS, anxious arousal,	SRS, mannerisms, mean ± SD: **G1:** 17.46 ± 5.93 **G2:** 21.00 ± 5.91 p < 0.05 3-month follow-up **G1:** 17.00 ± 7.05 p < 0.05 **Communication/ language:** SRS, communication, mean ± SD: **G1:** 29.71 ± 7.83 **G2:** 36.33 ± 9.83 p < 0.05 3-month follow-up **G1:** 31.07 ± 8.73 p=NS **Problem behavior:** CIS-P, mean ± SD: **G1:** 15.54 ± 6.88 **G2:** 23.90 ± 10.25 p < 0.01 3-month follow-up **G1:** 14.13 ± 7.96 p < 0.05 vs. baseline CBCL, internalizing, mean ± SD: **G1:** 11.79 ± 5.36 **G2:**19.57 ± 9.85 p < 0.05 3-month follow-up **G1:** 11.47 ± 6.21 p < 0.01 vs. baseline CBCL, externalizing, mean ± SD:

N at post-treatment: **G1:** 22 **G2:** 21 **N at 3 month follow-up:** **G1:** 15 **G2:** NA	**Diagnostic approach:** NR **Diagnostic category, n (%):** Autism: **G1**: 10 (41.7) **G2**: 3 (14.3) PDD-NOS: **G1**: 9 (37.5) **G2**: 9 (42.9) Asperger's syndrome: **G1**: 5 (20.8) **G2**: 9 (42.9) **Other characteristics, n (%):** Primary anxiety disorder n (%): Social Phobia: **G1:** 10 (41.7) **G2:** 8 (38.1) SAD: **G1:** 3 (12.5) **G2:** 6 (28.6) OCD: **G1:**2 (8.3) **G2:** 2 (9.5) GAD: **G1:** 9 (37.5) **G2:** 5 (23.8) **Other comorbid diagnoses n (%):** SAD: **G1**: 6 (25.0)	mean ± SD: **G1:** 2.50 ± 1.69 **G2:** 3.24 ± 1.87 **Educational/ cognitive/ academic attainment:** SRS, cognition, mean ± SD: **G1:** 19.00 ± 4.62 **G2:** 21.10 ± 5.02	**G1:** 11.08 ± 8.35 **G2:** 17.24 ± 12.81 p=NS 3-month follow-up **G1:** 9.33 ± 8.77 p < 0.05 vs. baseline **Anxiety:** PARS, mean ± SD: **G1:** 11.58 ± 3.15 **G2:** 16.05 ± 3.22 p < 0.01 3-month follow-up **G1:** 11.20 ± 4.28 p < 0.01 vs. baseline ADIS Highest CSR, mean ± SD**:** **G1:** 3.38 ± 1.81 **G2:** 4.90 ± 1.51 p < 0.01 3-month follow-up **G1:** 3.47 ± 2.45 p < 0.01 vs. baseline MASC-P, mean ± SD**:** **G1:** 51.96 ± 13.44 **G2:** 58.43 ± 12.81 p=NS 3-month follow-up **G1:** 47.80 ± 9.78 p < 0.01 vs. baseline RCMAS, dysphoric mood, mean ± SD: **G1:** 3.21 ± 1.93 **G2:** 3.10 ± 1.76 p=NS 3-month follow-up **G1:** 1.93 ± 1.91 p≤0.05 vs. baseline

	G2: 5 (23.8) Social phobia: **G1**: 7 (29.2) **G2**: 11 (52.4) GAD: **G1**: 11 (45.8) **G2**: 11 (52.4) ADHD: **G1**: 17 (70.8) **G2**: 16 (76.2) Dysthymia/MDD: **G1**: 1 (4.2) **G2**: 2 (9.5) ODD/CD: **G1**: 9 (37.5) **G2**: 11 (52.4) Specific phobia: **G1**: 16 (66.7) **G2**: 13 (61.9) **OCD:** **G1:** 3 (12.5) **G2:** 6 (28.6)	RCMAS, oversensitivity, mean ± SD: **G1:** 2.54 ± 1.98 **G2:** 3.29 ± 1.90 p=NS 3-month follow-up **G1:** 1.40 ± 2.03 p=NS vs. baseline RCMAS, worry, mean ± SD: **G1:** 3.58 ± 2.41 **G2:** 3.86 ± 2.41 p=NS 3-month follow-up **G1:** 2.73 ± 2.49 p=NS vs. baseline RCMAS, anxious arousal, mean ± SD: **G1:** 2.29 ± 1.43 **G2:**3.48 ± 1.63 p < 0.05 3-month follow-up **G1:** 1.93 ± 1.67 p=NS vs. baseline **Educational/ cognitive/ academic attainment:** SRS, cognition, mean ± SD: **G1:** 17.38 ± 5.33 **G2:** 18.86 ± 5.72 p=NS 3-month follow-up: **G1:** 19.27 ± 6.13 p=NS vs. baseline **Harms:** NR **Modifiers:** NR
Comments: Only CBT responders were analyzed in the 3-month follow-up phase.		

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Warreyn et al. 2013[25] **Country:** Belgium **Intervention setting:** 10 rehabilitation centers **Enrollment period:** NR **Funding:** Grants from Marguerite-Marie Delacroix Foundation; VVA, the Flemish Parent Association **Design:** Quasi-RCT (patients matched in pairs before randomization)	**Intervention:** Intervention promoting joint attention and imitation; training package delivered to usual therapist for execution; 30-minute sessions administered twice/week, 24 total sessions over mean 4.5-5 months **Assessments:** observation **Groups:** **G1:** Joint attention and imitation intervention **G2:** Usual care **Provider:** • Patient's usual therapist (psychologist, speech-language therapist, or special educationalist) **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** No **Co-interventions held stable during treatment:**	**Inclusion criteria:** age 3-7 years mental age < 7 years basic language understanding (simple instructions and requests) diagnosis of PDD-NOS or ASD **Exclusion criteria:** see inclusion criteria **Age, mean/yrs ± SD (range):** **G1:** 5.72 ± 0.59 (4.70 – 6.80) **G2:** 5.74 ± 0.72 (4.07 – 6.92) **Mental age, mean ± SD (range):** Full-scale IQ: **G1:** 78.94 ± 15.49 (50.00 – 103.00) **G2:** 76.86 ± 16.79 (50.00 – 105.00) Verbal IQ: **G1:** 71.86 ± 13.55 (53.00 – 91.00) **G2:** 79.33 ± 14.55 (53.00 – 101.00) Performance IQ: **G1:** 79.38 ± 16.19 (52.00 – 97.00) **G2:** 77.66 ± 16.36 (56.00 –	**Communication/ language, mean ± SD:** Total joint attention: **G1:** 1.46 ± 0.60 **G2:** 1.65 ± 0.60 Ambiguous behavior: **G1:** 0.21 ± 0.21 **G2:** 0.17 ± 0.18 Gaze following: **G1:** 0.61 ± 0.19 **G2:** 0.69 ± 0.16 Initiating requests: **G1:** 0.33 ± 0.36 **G2:** 0.31 ± 0.31 Initiating declarative JA: **G1:** 0.31 ± 0.39 **G2:** 0.47 ± 0.44 Spontaneous declarative JA: **G1:** 0.89 ± 0.96 **G2:** 0.67 ± 1.33 Total imitation: **G1:** 3.12 ± 0.70 **G2:** 3.16 ± 0.65 Gestural imitation: **G1:** 0.67 ± 0.19 **G2:** 0.67 ± 0.25	**Communication/ language, mean ± SD:** Total joint attention: **G1:** 1.81 ± 0.73 **G2:** 1.24 ± 0.56 Group x time: p<0.01 Ambiguous behavior: **G1:** 0.24 ± 0.23 **G2:** 0.08 ± 0.15 Group x time: p=NS Gaze following: **G1:** 0.82 ± 0.22 **G2:** 0.67 ± 0.29 Group x time: p<0.05 Initiating requests: **G1:** 0.57 ± 0.38 **G2:** 0.30 ± 0.25 Group x time: p<0.05 Initiating declarative JA: **G1:** 0.17 ± 0.30 **G2:** 0.19 ± 0.30 Group x time: p=NS Spontaneous

No **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 24 **G2:** 24 **N at follow-up:** **G1:** 18 **G2:** 18	110.00) **Sex:** M, n (%): **G1:** 14 (77.8) **G2:** 13 (72.2) F, n (%): **G1:** 4 (22.2) **G2:** 5 (27.8) **Race/ethnicity, n (%):** NR **SES:** Maternal education, n (%): NR Household income, mean (range): NR **Diagnostic approach:** Referral Diagnostic tool/method: DSM-IV TR **Diagnostic category, n (%):** NR **Other characteristics**, n (%)**:** **Language age, mean years ± SD (range):** **G1:** 4.27 ± 1.12 (2.00 – 6.00) **G2:** 4.48 ± 0.70 (2.90 – 5.80)	Verbal imitation: **G1:** 0.85 ± 0.27 **G2:** 0.90 ± 0.16 Object imitation: **G1:** 0.54 ± 0.19 **G2:** 0.55 ± 0.15 Symbolic imitation actions: **G1:** 0.69 ± 0.25 **G2:** 0.70 ± 0.31 Symbolic imitation vocalizations: **G1:** 0.37 ± 0.30 **G2:** 0.35 ± 0.30	declarative JA: **G1:** 1.72 ± 2.19 **G2:** 0.78 ± 1.00 Group x time: p=NS Total imitation: **G1:** 3.64 ± 0.61 **G2:** 3.42 ± 0.54 Group x time: p=NS Gestural imitation: **G1:** 0.69 ± 0.13 **G2:** 0.67 ± 0.29 Group x time: p=NS Verbal imitation: **G1:** 0.95 ± 0.10 **G2:** 0.88 ± 0.25 Group x time: p=NS Object imitation: **G1:** 0.62 ± 0.24 **G2:** 0.67 ± 0.15 Group x time: p=NS Symbolic imitation actions: **G1:** 0.88 ± 0.13 **G2:** 0.86 ± 0.11 Group x time: p=NS Symbolic imitation vocalizations: **G1:** 0.51 ± 0.29 **G2:** 0.35 ± 0.34

	Group x time: p=NS **Harms:** NR **Modifiers** No significant effect modification by age or FSIQ Significant positive correlation between VIQ and progress on imitation ($p<0.05$) for G1

Comments: Baseline and population characteristics only reported for the subpopulation that completed the study (36 of 48 initial participants)

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Wong 2013[26] **Country:** US **Intervention setting:** classroom **Enrollment period:** NR **Funding:** Autism Speaks; Institute of Education Sciences **Design:** RCT	**Intervention:** Special education teachers trained during 8 1-hour sessions delivered weekly, with 4 sessions each on symbolic play (SP) and joint attention (JA) Groups received the SP and JA training in random order (JA/SP or SP/JA), with the wait-list control group receiving no intervention for 1st 4 weeks, followed by randomization to either JA/SP or SP/JA **Assessments:** observed **Groups:** **G1:** JA/SP **G2:** SP/JA **G3:** wait list control **G3a:** JA/SP **G3b:** SP/JA **Provider:** • Classroom teacher **Treatment manual followed:** Yes **Defined protocol followed:** Yes	**Inclusion criteria:** Children aged 3-6 years diagnosed with autism and in special education classroom **Exclusion criteria:** See inclusion criteria **Age, mean months ±SD:** **G1:** 56.21 ± 10.42 **G2:** 54.50 ± 5.06 **G3:** 59.67 ± 10.61 **Mental age, mean months ± SD:** Mullen Scales of Early Learning (MSEL): **G1:** 36.25 ± 11.00 **G2:** 27.39 ± 14.47 **G3:** 30.38 ± 13.19 MSEL, receptive language age, mean months ± SD: **G1:** 38.55 ± 16.51 **G2:** 25.29 ± 15.77 **G3:** 29.50 ±13.58 MSEL, receptive language age, mean months ± SD: **G1:** 29.73 ± 10.05 **G2:** 24.00 ±16.41 **G3:** 24.00 ± 11.22 MSEL, early learning composite, mean ± SD: **G1:** 59.91 ± 16.42	**Social skills:** Functional play, mean acts/min ±SD: **G1+G3a:** 0.42 ± 0.45 **G2+G3b:** 0.94 ± 0.81 Symbolic play, mean acts/min ± SD: **G1+G3a:** 0.06 ± 0.14 **G2+G3b:** 0.03 ± 0.08 Structured play level, mean ± SD: **G1+G3a:** 8.41 ± 4.21 **G2+G3b:** 8.14 ± 3.82 **Communication/ language:** Joint attention: G1 vs. G2 vs. G3 at 4 weeks: p=NS Joint engagement, mean % time of observation ±SD: **G1+G3a:** 22.42 ± 14.07 **G2+G3b:** 15.85 ± 11.61	**Social skills:** Play measures: G1 vs. G2 vs. G3 at 4 weeks: p=NS Functional play, mean acts/min ±SD: **G1+G3a:** 0.62 ± 0.69 **G2+G3b:** 0.94 ±0.77 p=NS Symbolic play, mean acts/min ± SD: **G1+G3a:** 0.10 ±0.17 **G2+G3b:** 0.15 ± 0.26 p<0.05 Structured play level, mean ± SD: **G1+G3a:** 8.30 ± 3.87 **G2+G3b:** 8.07 ± 4.53 p=NS **Communication/ language:** Joint attention measures: G1 vs. G2 vs. G3 at 4 weeks: p=NS

Measure of treatment fidelity reported: Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 14 **G2:** 10 **G3:** 10 **N at follow-up:** **G1:** 14 **G2:** 10 **G3:** 9 **G3a:** 5 **G3b:** 4	**G2:** 56.14 ± 15.15 **G3:** 57.50 ± 10.61 **Sex:** M, n (%): **G1:** 12 (86) **G2:** 9 (90) **G3:** 8 (89) F, n (%): **G1:** 2 (14) **G2:** 1 (10) **G3:** 1 (11) **Race/ethnicity, n (%):** African American: **G1:** 6 (43) **G2:** 5 (50) **G3:** 5 (56) Hispanic: **G1:** 7 (50) **G2:** 5 (50) **G3:** 1 (11) White: **G1:** 1 (7) **G2:** 0 (0) **G3:** 3 (33) **SES:** Maternal education, n (%): High school or less: **G1:** 4 (29) **G2:** 4 (40) **G3:** 6 (67) Some college/vocational training: **G1:** 5 (36) **G2:** 3 (30) **G3:** 2 (22)	Joint attention responses, mean acts/min ±SD: **G1+G3a:** 0.28 ± 0.24 **G2+G3b:** 0.51 ± 0.37 Joint attention initiations, mean acts/min ±SD: **G1+G3a:** 0.11 ± 0.17 **G2+G3b:** 0.06 ± 0.12 Early Social Communication Scales (ESCS), mean joint attention responses ± SD: **G1+G3a:** 6.61 ± 3.01 **G2+G3b:** 4,40 ± 3.22 ESCS, mean joint attention initiations ± SD: **G1+G3a:** 10.94 ± 9.57 **G2+G3b:** 5.73 ± 8.70	Joint attention: G1 vs. G2 vs. G3 at 4 weeks: p=NS Joint engagement, mean % time of observation ±SD: **G1+G3a:** 54.08 ± 21.86 **G2+G3b:** 28.88 ± 15.38 p<0.001 Joint attention responses, mean acts/min ±SD: **G1+G3a:** 0.81 ± 0.61 **G2+G3b:** 0.53 ± 0.29 p<0.05 Joint attention initiations, mean acts/min ±SD: **G1+G3a:** 0.27 ± 0.21 **G2+G3b:** 0.07 ± 0.11 p<0.05 Early Social Communication Scales (ESCS), mean joint attention responses ± SD: **G1+G3a:** 8.11 ± 3.85

	College/professional/ graduate: **G1:** 5 (36) **G2:** 3 (30) **G3:** 1 (11) Household income, mean (range): NR **Diagnostic approach:** In Study Diagnostic tool/method: CARS **Diagnostic category, n (%):** Autism **G1:** 14 (100) **G2:** 10 (100) **G3:** 9 (100) **Other characteristics**, mean ±SD**:** CARS **G1:** 35.93 ± 7.49 **G2:** 39.60 ± 7.74 **G3:** 38.89 ± 6.95	**G2+G3b:** 4.93 ± 3.49 p<0.05 ESCS, mean joint attention initiations ± SD: **G1+G3a:** 6.72 ± 6.29 **G2+G3b:** 2.47 ± 4.00 p=NS **Harms** NR **Modifiers** Chronological age, autism severity as rated by CARS, and mental age by MSEL had no statistically significant effect on treatment response

Comments: teachers were the unit of randomization, not the individual children
G1: 5 teachers; **G2:** 4 teachers; **G3:** 5 teachers; **G3a:** 2 teachers; **G3b:** 2 teachers

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Adkins et al. 2012[27] **Country:** US **Intervention setting:** home **Enrollment period:** NR **Funding:** NR **Design:** RCT	**Intervention:** Sleep education pamphlet for parents **Assessments:** actigraphy to measure sleep parameters;parents trained in use; and daily diary forms; CSHQ parental questionnaire describing sleep behaviors in children; Stanford Binet 5 or Mullen Scales of Early Learning. Data collected two weeks after randomization **Groups:** **G1:** pamphlet **G2:** no pamphlet **Provider:** • Parents **Treatment manual followed:** No **Defined protocol followed:** NR **Measure of treatment fidelity reported:** NR **Co-interventions held stable during treatment:** Yes	**Inclusion criteria:** aged 2-10 years diagnosis ASD based on DSM-IV confirmed by ADOS sleep onset latency of at least 30 minutes on 3 of 7 nights /week based on parent report and confirmed by 14 scorable days of actigraphy showing mean sleep latency of 30 minutes or more medication free or on stable dose of medications (no changes within 30 days of enrollment) parents agreeing to avoid changes in current meds during study time ability of child to tolerate actigraphy and willingness of parents to complete corresponding sleep diary English family primary language **Exclusion criteria:** medical and behavioral comorbidities that affect sleep, including sleep apnea, epilepsy, gastrointestinal reflux disease, depression,	Sleep latency, min mean ± SD: **G1:** 56.7 ± 27.1 **G2:** 52.1 ± 25.1 Sleep efficiency, % mean ± SD: **G1:** 75.5 ± 6.1 **G2:** 76.8 ± 6.0 Wake after sleep onset, min mean ± SD: **G1:** 61.9 ± 27.4 **G2:** 53.2 ± 20.2 Total sleep time, min mean ± SD: **G1:** 465.7 ± 66.3 **G2:** 461.4 ± 42.4 Fragmentation, min mean ± SD: **G1:** 36.8 ± 9.0 **G2:** 32.2 ± 7.2	Sleep latency, min mean ± SD: **G1:** 49.5 ± 26.7 **G2:** 61.3 ± 47.0 p=0.16 Sleep efficiency, % mean ± SD: **G1:** 77.8 ± 7.0 **G2:** 75.1 ± 6.7 p=0.04 Wake after sleep onset, min mean ± SD: **G1:** 60.4 ± 32.1 **G2:** 59.9 ± 24.2 p=0.22 Total sleep time, min mean ± SD: **G1:** 483.0 ± 67.8 **G2:** 470.8 ± 35.3 p=0.55 Fragmentation, min mean ± SD: **G1:** 36.3 ± 10.9 **G2:** 33.3 ± 7.5 p=0.52 **Harms:** NR **Modifiers:** NR

	anxiety, and attention deficit/hyperactivity disorder
Concomitant therapies, n (%):	untreated co-morbid conditions
Psychotropic	**Age, mean/yrs (range):**
G1: 5 (27.8)	6.4 ± 2.6
G2: 9 (50)	**Mental age, mean/yrs (range):**
Melatonin	**Sex:**
G1: 3 (16.7)	M, n (%):
G2: 3 (16.7)	**G1:** 10 (55.6)
Stimulants	**G2:** 14 (77.8)
G1: 2 (11.1)	
G2: 2 (11.1)	F, n (%):
N at enrollment:	**G1:** 8 (44.4)
G1: 18	**G2:** 4 (22.2)
G2: 18	**Race/ethnicity, n (%):**
N at follow-up:	White
G1: 19	**G1:** 15 (83.3)
G2: 17	**G2:** 14 (77.8)
	African American
	G1: 3 (16.7)
	G2: 3 (22.2)
	SES:
	Mean ± SD
	G1: 34.0 ± 16.7
	G2: 41.1 ± 11.9
	Diagnostic approach:
	In Study/Referral
	Diagnostic tool/method:
	DSM-IV and ADOS
	Diagnostic category, n (%):
	Autism
	G1: 16 (88.9)
	G2: 13 (72.2)

	PDD-NOS **G1:** 0 **G2:** 1 (5.6) Aspergers **G1:** 2 (11.1) **G2:** 4 (22.2) **Other characteristics**, n (%)**:** IQ, mean ± SD **G1:** 75.1 ± 25.5 **G2:** 85.6 ± 27.1

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Aldred et al. 2012[28] **Country:** UK **Intervention setting:** Clinic **Enrollment period:** NR **Funding:** Grant from Shirley Foundation **Design:** RCT Note: See initial publication in 2011 AHRQ review [29] for efficacy results	**Intervention:** Communication-focused parent mediated intervention over 12 months (6 months of monthly clinic sessions and 6 months of bi-monthly maintenance sessions) **Assessments:** Parent-Child Interaction (PCI), Autism Diagnostic Observation Schedule, MacArthur Communicative Development Inventory **Groups:** **G1:** Parent mediated communication-focused intervention **G2:** Treatment as usual **Provider:** Speech and language therapists in clinic, with additional home program **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** NR	**Inclusion criteria:** • clinical diagnosis of core autistic disorder confirmed by ADOS and ADI-R by assessing professional team **Exclusion criteria:** NR **Age, mean months ± SD:** **G1:** 51.4 ± 11.8 **G2:** 50.9 ± 16.3 **Mental age, mean/yrs (range):** NR **Sex:** M, n (%): **G1:** 13 (93) **G2:** 12 (86) F, n (%): **G1:** 1 (7) **G2:** 2 (14) **Race/ethnicity, n (%):** NR **SES:** NR **Diagnostic approach:** In Study/Referral Diagnostic tool/method: ADOS and ADI-R **Diagnostic category, n (%):** Autism (100)	Parent synchrony, mean ± SD: **G1:** 57.8 ± 15.0 **G2:** 56.4 ± 16.5 ADOS social communication algorithm total, mean ± SD: **G1:** 16.1 ± 4.5 **G2:** 15.6 ± 4.9	Parent synchrony, mean ± SD: **G1:** 65.1 ± 14.3 **G2:** 48.9 ± 19.5 ADOS social communication algorithm total, mean ± SD: **G1:** 11.8 ± 6.4 **G2:** 16.1 ± 4.4 **Harms:** NR **Modifiers** Increase in parental synchronous response within parent-child interaction partly mediated positive intervention effect on ADOS social communication algorithm scores, accounting for 34% of effect

Co-interventions held stable during treatment: NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 14 **G2:** 14 **N at follow-up:** **G1:** **G2:**	**Other characteristics**, n (%)**:** Vineland adaptive behavior composite, mean ± SD **G1:** 25.6 ± 9.2 **G2:** 22.0 ± 5.6 Vineland communication sub-domain **G1:** 22.6 ± 13.3 **G2:** 20.0 ± 10.8 Vineland social sub-domain **G1:** 18.2 ± 5.8 **G2:** 16.3 ± 3.6 MacArthur Communicative Developmental Inventory words produced, median (range): **G1:** 69.5 (467) **G2:** 78.5 (683) MacArthur Communicative Developmental Inventory vocabulary comprehension, median (range): **G1:** 95.0 (381) **G2:** 144.0 (426) PCI- Child Communication Acts, mean ± SD: **G1:** 30.8 ± 10.2 **G2:** 30.1 ± 11.1

Comments: Secondary analysis of communication intervention trial (Aldred et al. 2004)

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Cortesi et al. 2012[30] **Country:** Italy **Intervention setting:** Clinic and home **Enrollment period:** 2007 to 2010 **Funding:** NR **Design:** RCT	**Intervention:** Melatonin- 3 mg controlled release administered daily at 21:00 h. Cognitive behavioral therapy (CBT)- four weekly 50 min individual treatment sessions outpatient clinic. A sleep-focused multifactorial intervention involved cognitive, behavioral and educational components. **Assessments:** Children's Sleep Habits Questionnaire (CSHQ); actigraphy monitoring, sleep monitoring. Completed at baseline and after 12 weeks. **Groups:** **G1:** Combination therapy **(**Melatonin and CBT) **G2:** Melatonin only **G3:** CBT only **G4:** Placebo **Provider:** CBT- clinical psychologists **Treatment manual followed:** NR	**Inclusion criteria:** • age 4-10 years • DSM-IV-TR diagnosis of autistic disorder confirmed by ADI-R • Mixed sleep onset and maintenance insomnia defined as sleep onset latency and wake after sleep onset > 30 min on 3 or more nights/week • Absence of other serious neurological, psychiatric or medical conditions **Exclusion criteria:** • see above Age, mean/yrs ± SD: **G1:** 6.4 ± 1.1 **G2:** 6.8 ± 0.9 **G3:** 7.1 ± 0.7 **G4:** 6.3 ± 1.2 **Mental age, mean/yrs (range):** NR **Sex:** M, %: **G1:** 80 **G2:** 82 **G3:** 83 **G4:** 84 **Race/ethnicity, %:** White	Total sleep time (TST), mean ± SD: **G1:** 414.03 ± 45.34 **G2:** 410.28 ± 45.07 **G3:** 408.08 ± 49.03 **G4:** 413.00 ± 45.13 Sleep onset latency (SOL), mean ± SD: **G1:** 85.84 ± 20.02 **G2:** 81.21 ± 32.35 **G3:** 76.34 ± 31.70 **G4:** 78.20 ± 33.83 Wake after sleep onset (WASO), mean ± SD: **G1:** 69.50 ± 23.35 **G2:** 73.71 ± 45.00 **G3:** 68.72 ± 31.77 **G4:** 69.75 ± 45.21 Naptime, mean ± SD: **G1:** 28.26 ± 49.13 **G2:** 33.57 ± 56.63 **G3:** 35.31 ± 60.17 **G4:** 37.33 ± 56.19 Sleep efficiency (SE), mean ± SD: **G1:** 70.26 ± 4.83 **G2:** 71.10 ± 4.91 **G3:** 71.37 ± 4.77 **G4:** 71.13± 4.99 Bedtime, mean ± SD: **G1:** 23.33 ± 1.35 **G2:** 23.45 ± 1.15	Total sleep time (TST), mean ± SD: **G1:** 505.01 ± 31.18 **G2:** 481.10 ± 33.15 **G3:** 445.13 ± 48.37 **G4:** 416.23 ± 43.60 P< 0.001 Sleep onset latency (SOL), mean ± SD: **G1:** 33.69 ± 14.40 **G2:** 45.21 ± 23.21 **G3:** 59.13 ± 27.60 **G4:** 79.60 ± 31.85 P<0.001 Wake after sleep onset (WASO), mean ± SD: **G1:** 29.69 ± 12.97 **G2:** 42.21 ± 22.35 **G3:** 61.17 ± 28.93 **G4:** 70.15 ± 42.76 P<0.001 Naptime, mean ± SD: **G1:** 9.20 ± 22.48 **G2:** 17.00 ± 33.11 **G3:** 12.29 ± 24.24 **G4:** 36.10 ± 33.28 P=0.23 Sleep efficiency (SE), mean ± SD: **G1:** 84.46 ± 4.23 **G2:** 82.71 ± 4.00 **G3:** 79.58 ± 2.82 **G4:** 71.93± 4.62

	G1: 100	**G3:** 23.39 ± 1.03	P<0.001
Defined protocol followed: Yes	**G2:** 100	**G4:** 23.41 ± 1.19	
	G3: 100		Bedtime, mean ± SD:
	G4: 96	CSHQ, total score, mean ± SD:	**G1:** 22.06 ± 1.05
Measure of treatment fidelity reported: NR		**G1:** 66.11 ± 5.47	**G2:** 22.30 ± 1.10
	SES:	**G2:** 66.67 ± 8.55	**G3:** 22.55 ± 1.01
	Low SES (index of 3 or less on Hollingshead Two-Factor Index of Social Position), %:	**G3:** 64.48 ± 5.48	**G4:** 23.51 ± 1.12
Co-interventions held stable during treatment: NA		**G4:** 64.20 ± 4.85	P<0.001
	G1: 24		CSHQ, total score, mean ± SD:
Concomitant therapies, n (%):	**G2:** 25	CSHQ, bed resistance, mean ± SD:	**G1:** 47.84 ± 2.94
	G3: 23	**G1:** 14.53 ± 1.82	**G2:** 54.78 ± 6.22
All subjects drug free for at least 6 months prior to beginning of study and throughout the study	**G4:** 26	**G2:** 13.85 ± 2.23	**G3:** 60.06 ± 4.71
		G3: 13.44 ± 2.08	**G4:** 64.80 ± 4.52
	Maternal education, mean years ± SD:	**G4:** 13.63 ± 1.82	p <0.001
	G1: 13 ± 4	CSHQ, sleep onset delay, mean ± SD:	CSHQ, bed resistance, mean ± SD:
	G2: 14 ± 7	**G1:** 2.88 ± 0.32	**G1:** 8.46 ± 1.39
N at enrollment:	**G3:** 13 ± 6	**G2:** 2.85 ± 0.35	**G2:** 10.50 ± 2.20
G1: 40	**G4:** 13 ± 5	**G3:** 2.89 ± 0.30	**G3:** 11.62 ± 2.22
G2: 40		**G4:** 2.90 ± 0.31	**G4:** 14.10 ± 1.93
G3: 40	**Diagnostic approach:**		p <0.001
G4: 40	Referral		
	Diagnostic tool/method:	CSHQ, sleep anxiety, mean ± SD:	
N at follow-up:	DSM-IV-TR confirmed by ADI-R	**G1:** 7.95 ± 1.83	CSHQ, sleep onset delay, mean ± SD:
G1: 35		**G2:** 8.35 ± 2.19	**G1:** 1.69 ± 0.73
G2: 34	**Diagnostic category, n (%):**	**G3:** 8.62 ± 1.98	**G2:** 2.10 ± 0.68
G3: 33	ASD: 100%	**G4:** 7.66 ± 1.73	**G3:** 2.51 ± 0.57
G4: 32			**G4:** 2.93 ± 0.25
		CSHQ, night-wakings, mean ± SD:	p <0.001
	Other characteristics, n (%)**:** NR	**G1:** 7.61 ± 0.89	CSHQ, sleep anxiety, mean ± SD:
		G2: 7.67 ± 0.94	**G1:** 5.23 ± 0.95
		G3: 7.62 ± 0.94	**G2:** 7.21 ± 1.87
		G4: 7.76 ± 0.93	**G3:** 7.17 ± 1.48
			G4: 7.93 ± 1.99
		CSHQ, sleep duration, mean ± SD:	p <0.001
		G1: 7.34 ± 1.35	

	G2: 7.17 ± 1.51 **G3:** 7.01 ± 1.48 **G4:** 6.46 ± 1.25 CSHQ, parasomnias, mean ± SD: **G1:** 9.15 ± 1.68 **G2:** 9.10 ± 2.42 **G3:** 9.75 ± 2.11 **G4:** 8.96 ± 1.80 CSHQ, daytime sleepiness, mean ± SD: **G1:** 13.92 ± 2.86 **G2:** 13.35 ± 3.84 **G3:** 13.31 ± 2.67 **G4:** 13.13 ± 3.11	CSHQ, night-wakings, mean ± SD: **G1:** 4.42 ± 0.90 **G2:** 5.03 ± 1.10 **G3:** 7.06 ± 1.06 **G4:** 7.86 ± 0.81 p <0.001 CSHQ, sleep duration, mean ± SD: **G1:** 4.38 ± 1.02 **G2:** 4.82 ± 0.94 **G3:** 6.68 ± 1.16 **G4:** 6.40 ± 1.29 p <0.001 CSHQ, parasomnias, mean ± SD: **G1:** 8.92 ± 1.38 **G2:** 9.35 ± 1.78 **G3:** 9.82 ± 2.25 **G4:** 9.16 ± 1.53 p =0.82 CSHQ, daytime sleepiness, mean ± SD: **G1:** 10.84 ± 1.68 **G2:** 11.39 ± 2.34 **G3:** 11.96 ± 1.97 **G4:** 12.96 ± 1.97 p <0.001 **Harms:** NR **Modifiers:** NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Dawson et al. 2012[31] **Country:** USA **Intervention setting:** NR **Enrollment period:** NR **Funding:** NR **Author industry relationship disclosures:** NR **Design:** RCT Note: See earlier study reporting on this population[32] in 2011 AHRQ review[9]	**Intervention:** ESDM intervention for 2hours,twice a day, 5 days a week, for 2 years. Community intervention: Families were given resource manuals And reading materials at baseline and twice yearly **Assessments:** ADI-R, ADOS, MSEL, Vineland Scales of Adaptive Behavior, PDD Behavioral Inventory, EEG **Groups:** **G1:** ESDM **G2:** Community intervention **Provider:** Trained therapists **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR	**Inclusion criteria:** • age <30 months at entry, • meeting criteria for an autistic disorder on the Toddler Autism Diagnostic Interview (ADI) and for autism or ASD on the Autism Diagnostic Observation Schedule(ADOS) and a clinical diagnosis based on DSM-IV criteria • residing within 30 minutes of the University of Washington. **Exclusion criteria:** • neurologic disorder of known genetic etiology, • significant sensory or motor impairment, major physical problems, seizures at the time of entry, • use of psychoactive medications, • a history of a serious head injury and/ or neurologic disease, alcohol or drug exposure during the	MSEL Verbal IQ **G1:** 45.3, ± 17.5; **G2:** 48.1, ± 21.2 MSEL Nonverbal IQ **G1:** 83.6, ± 13.3 **G2:** 79.2, ± 11.3	Verbal IQ **G1:** 95.1, ± 15.7 **G2:** 75.1, ± 18.4 (p=0.004) Nonverbal IQ: **G1:** 93.1, ± 16.5 **G2:** 80.0, ± 15.8 (p=0.04) Vineland Communication **G1:** 95.3 ± 15 **G2:**mean76.1, ± 14.7 (p=0.02) Social **G1:** 74.7,± 10.0 **G2:** 66.5 ± 8.3 (p=0.02) Daily Living Skills **G1:** 72 ± 11.9 **G2:** 58.9 ± 7.9 (p=0.006), Aberrant Behaviors **G1:** 76.9, ± 13.6 **G2:** 61.2, ± 7.9 (p=0.001) PDD-BI Expressive Social Communication composite scores: **G1:** 65.4, ± SD 6.5; **G2:**54.5, ± SD10.2; (p=0.004)

Concomitant therapies, n (%): NR **N at enrollment:** **G1:** 17 **G2:** 14 **N at follow-up:** **G1:** 17 **G2:** 14	prenatal period • -nonverbal IQ below 35 **Age, mean/yrs (range):** **G1:** 54.1 months ± 4.9 months; **G2:** 54.1 months, ± 7.8 months **Mental age, mean/yrs (range):** NR **Sex:** Male to female ratio: **G1+G2:** 3.5:1 **Race/ethnicity, n (%):** **G1+G2**: Asian 12.5%, white (72.9%), Latino (12.5%), and multiracial 14.6%) **SES:** NR **Diagnostic approach:** In Study Diagnostic tool/method: ADI, ADOS, DSM-IV **Diagnostic category, n (%):** Autism : 100% **Other characteristics, n (%):** ADOS Social scores: **G1:** 10.3, SD 2.3 **G2:** 11.1, SD 2.7) ADOS Restricted and Repetitive Behaviors:	PDD-BI Receptive/Expression Social Communication composite scores: **G1:** 65.5, ± 5.6 **G2:**55.3, ± 10.3 (p=0.006) **Harms:** NR **Modifiers:** NR

	G1: 2.6, SD 1.3 **G2:** 3.6, SD 2.0)

Comments: 11/15 children (73%) in G1 and 4/14 in G2 showed a faster Nc response to faces than to objects. ERP and cortical activation data not included here. Greater cortical activation while viewing faces associated with improved social behavior.

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Eikeseth et al. 2012[33] **Country:** Sweden/Norway **Intervention setting:** Mainstream public preschools or kindergartens, and children's homes **Enrollment period:** March 2008 – May 2010 (experimental group); 2005 – 2010 (control group) **Funding:** NR **Design:** Retrospective cohort	**Intervention:** Early and Intensive Behavioral Intervention (EIBI) for 1 year (15-37 hours per week; mean = 23, sd = 5.3) in preschool/kindergarten classrooms and homes **Assessments:** Conducted by child's supervisor: • VABS (Vineland Adaptive Behavior Scales), adaptive and maladaptive behavior subscales • CARS (Childhood Autism Rating Scale) **Groups:** **G1:** EIBI **G2:** standard care **Provider:** EIBI education team: Therapist: school staff, no academic degree, no training/experience with EIBI prior to study Parents Supervisor from Banyan Center (Sweden) with	**Inclusion criteria:** • diagnosis of autism • no EIBI prior to enrollment (G1) **Exclusion criteria:** • prior EIBI treatment (G1) **Age, mean/yrs ± SD:** **G1:** 3.9 ± 0.9 **G2:** 4.4 ± 1.2 **Mental age, mean/yrs (SD):** NR **Sex, n (%):** **G1:** M: 29 (83) F: 6 (17) **G2:** M: 20 (83) F: 4 (17) **Race/ethnicity, n (%):** NR **SES:** NR **Diagnostic approach:** G1; NR G2: all children diagnosed at Akershus University Hospital based on ICD-10 criteria	**Overall ratings:** Global Rating of Severity, mean ± SD: CARS **G1:** 37.2 ± 7.7 **G2:** NR **Social skills, mean ± SD:** VABS, socialization **G1:** 65.4 ± 9.8 **G2:** 63.3 ± 7.0 **Communication/ language, mean ± SD:** VABS, communication **G1:** 67.1 ± 14.0 **G2:** 65.5 ± 14.2 **Repetitive behavior:** NR **Problem behavior, mean ± SD:** VABS maladaptive **G1:** 19.5 ± 2.4 **G2:** NR **Adaptive behavior, mean ± SD:** VABS, total **G1:** 67.0 ± 10.3 **G2:** 63.6 ± 8.1 VABS age equivalent: **G1:** 1.9 ± 0.9 **G2:** 2.1 ± 0.8	**Overall ratings:** Global Rating of Severity, mean ± SD: CARS, 1-year follow-up: **G1:** 30.6 ± 7.1 **G2:** NR p < .001 2-year follow-up: **G1:** 27.2 ± 6.2 **G2:** NR p < .05 **Social skills, mean ± SD:** 1-year follow-up: VABS, socialization **G1:** 72.5 ± 12.3 **G2:** 64.3 ± 9.4 p<0.01 **Communication/ language:** 1-year follow-up: VABS, communication **G1:** 81.3 ± 16.9 **G2:** 63.6 ± 16.0 p<0.001 **Problem behavior, mean ± SD:** 1-year follow-up: VABS, maladaptive **G1:** 16.9 ± 2.5 **G2:** NR **Adaptive behavior,**

	bachelor's or master's degrees Other significant adults Standard care education team: • Special education teacher with minimum of bachelor's degree Teacher assistant, typically no academic degree **Treatment manual followed:** No – Based on UCLA model **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** NR **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 35 **G2:** 24 **N at follow-up:** VABS Adaptive: 1-year follow-up: **G1:** 35	**Diagnostic category, n (%):** Autism **G1:** 35 (100) **G2:** 24 (100) **Other characteristics**, n (%)**:** NR	VABS, ADL **G1:** 71.8 ± 12.8 **G2:** 67.5 ± 10.9 **Motor skills, mean ± SD:** VABS, motor **G1:** 75.9 ± 12.8 **G2:** 72.5 ± 10.6	**mean ± SD:** 1-year follow-up: VABS, total **G1:** 75.3 ± 12.0 **G2:** 64.0 ± 12.5 p<0.01 VABS, ADL 1-year follow-up: **G1:** 78.3 ± 14.4 **G2:** 68.0 ± 14.8 P<0.01 **Motor skills, mean ± SD:** 1-year follow-up: VABS, motor **G1:** 80.6 ± 10.6 **G2:** 71.8 ± 14.4 p<0.05 **Educational/ cognitive/ academic attainment:** VABS, learning rate: mean ± SD 1-year follow-up: **G1:** 1.13 ± 0.66 **G2:** 0.59 ± 0.43 2-year follow-up: **G1:** 0.81 ± 0.72 **G2:** NR p<0.001 **Harms:** NR **Modifiers:** NR

G2: NR

2-year follow-up:
G1: 15
G2: NR

VABS Maladaptive:
1-year follow-up:
G1: 24
G2: NR

2-year follow-up:
G1: 14
G2: NR

CARS:
1-year follow-up:
G1: 27
G2: NR

2-year follow-up:
G1: 13
G2: NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Eldevik et al. 2012[34] **Country:** Norway **Intervention setting:** school **Enrollment period:** January 2000 to February 2011 **Funding:** NR **Design:** cohort	**Intervention:** EIBI pre-school model **Assessments:** Bayley Scales of Infant Development (BSID), Stanford-Binet Intelligence Scale: Fourth or Fifth Edition, Norwegian version of the Wechsler Preschool and Primary Scale Intelligence-Revised (WPPSI); Vineland Adaptive Behavior Scales I or II (VABS). Assessment done after two years. **Groups:** **G1:** EIBI intervention **G2:** Treatment as usual **Provider:** Psychologist was consultant for the supervisors at the preschools- Supervisors had bachelor's degrees and between 2-10 years of experience with EIBI programs; school staff also administered EIBI **Treatment manual followed:** "The intervention was	**Inclusion criteria:** • independent diagnosis of autism or PDD-NOS based on ADI-R • between 2 and 6 years of age at intake • full-scale intelligence test and measure of adaptive behavior at intake and after two years of intervention • at least 5 hours/week of intervention **Exclusion criteria:** -See above Age, mean/months ± SD (range): **G1:** 42.2 ± 9.0 (26-70) **G2:** 46.2 ± 12.4 (24-67) **Mental age, mean/yrs (range):** NR **Sex:** M, n (%): **G1:** 25 (80.6) **G2:** 8 (66.7) F, n (%): **G1:** 6 (19.4) **G2:** 4 (33.3) **Race/ethnicity, n (%):** 16 of 31 children in EIBI group from ethnic minority groups in Norway (51.6%)	Intellectual functioning, mean ± SD (range) **G1:** 51.6 ± 16.9 (24-94) **G2:** 51.7 ± 18.1 (30-89) **Adaptive behavior**: VABS Adaptive behavior composite **G1:** 62.5 ± 8.2 (46-77) **G2:** 58.9 ± 7.8 (50-73) Communication **G1:** 61.9 ± 10.2 (48-89) **G2:** 60.0 ± 9.6 (49-81) Daily living **G1:** 69.9 ± 10.8 (48-89) **G2:** 64.8 ± 10.6 (54-91) Socialization **G1:** 63.3 ± 9.8 (49-97) **G2:** 63.1 ± 8.9 (53-82)	Intellectual functioning, mean ± SD (range) **G1:** 66.6 ± 24.8 (23-110) **G2:** 52.2 ± 22.0 (23-86) **Adaptive behavior:** VABS Adaptive behavior composite **G1:** 68.4 ± 12.6 (46-97) **G2:** 59.6 ± 11.8 (47-83) Communication **G1:** 70.5 ± 16.9 (42-114) **G2:** 60.0 ± 14.5 (42-84) Daily living **G1:** 72.0 ± 12.9 (47-93) **G2:** 63.2 ± 14.2 (48-95) Socialization **G1:** 69.1 ± 12.0 (49-90) **G2:** 60.8 ± 8.6 (41-80) **Harms:** NR **Modifiers** Three variables associated with outcome in G1: Age at intake correlated positively with gains in ABC scores. Other diagnosis (PDD-NOS or Asperger, rather than autism) was associated with larger gains in ABC scores and

based on several widely used EIBI manuals." **Defined protocol followed:** NR **Measure of treatment fidelity reported:** NR **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 31 **G2:** 12 **N at follow-up:** **G1:** 31 **G2:** 12	**SES:** NR **Diagnostic approach:** EIBI group: Referral from pedagogical-psychological services through local educational authorities to specialist evaluation Diagnostic tool/method: ADI-R **Diagnostic category, n (%):** Autism **G1:** 25 (80.6) **G2:** 9 (75) PDD-NOS **G1:** 5 (16.1) **G2:** 3 (25)) Aspergers **G1:** 1 (3.2) **G2:** 0 (0) **Other characteristics, n (%):** Level of intellectual disability No ID **G1:** 4 (12.9) **G2:** 2 (16.7) Mild ID **G1:** 10 (32.3) **G2:** 4 (33.3) Moderate ID **G1:** 12 (38.7) **G2:** 5 (41.7)	larger gains in communication and daily living skills sub domain. IQ at intake correlated positively with change in socialization sub domain of the VABS.

	Severe ID **G1:** 5 (16.1) **G2:** 1 (8.3) Profound **G1:** 0 (0) **G2:** 0 (0)

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures*	Outcomes
Author: Scahill et al. 2012[35-38] **Country:** USA **Intervention setting:** (e.g., clinic, home, etc.) **Enrollment period:** NR **Funding:** Federal grant **Author industry relationship disclosures:** 6/24 **Design:** RCT	**Intervention:** Risperidone (0.5 to 3.5 mg/day) or aripiprazole if risperidone was ineffective ((aripiprazole started at 2 mg and adjusted up to 15 mg) or a combination of medication plus parent training (Combined group) . Parents of children in combined group received an average of 11.4 PT sessions. **Assessments:** Home Situations Questionnaire (HSQ), Aberrant Behavior Checklist-Irritability (ABC-I), Vineland Adaptive Behavior Scales (VABS), Noncompliance index. Assessed weekly for 8 weeks then every 4 weeks until week 24. Follow-up study at 1 year **Groups:** **G1:** risperidone **G2:** risperidone + parent training **Co-interventions held stable during treatment:** Yes **Frequency of contact**	**Inclusion criteria:** Age between 4 and 14 years DSM-IV-TR diagnosis of autistic disorder, Asperger's disorder, or PDD-NOS based on clinical assessment and corroborated by the ADI-R Serious behavioral problems (e.g tantrums, aggression and self-injury) evidenced by score ≥ 18 on ABC-Irritability subscale and CGI-severity score ≥ 4 IQ ≥ 35 or mental age of 18 months from Stanford-Binet 5, Leiter International Performance Scale or Mullen Scales of Early Learning Anticonvulsant treatment permissible if medication was stable (≥ 4 wks) and subject was seizure free (≥ 18 mos) criterion 2 **Exclusion criteria:** significant medical condition by history, exam or lab test lifetime diagnosis of psychosis, bipolar	**HSQ, mean ± SD:** Average severity score **G1:** 4.16 ± 1.47 **G2:** 4.31 ± 1.67 "Yes" count **G1:** 18.9 ± 3.46 **G2:** 18.6 ± 4.65 **ABC, mean ± SD:** Irritability **G1:** 29.7 ± 6.10 **G2:** 29.3 ± 6.97 Social withdrawal **G1:** 17.1 ± 8.37 **G2:** 15.2 ± 9.01 Stereotypic behavior **G1:** 10.6 ± 5.46 **G2:** 7.59 ± 5.20 Hyperactivity/non compliance **G1:** 36.1 ± 6.86 **G2:** 35.3 ± 9.30 Inappropriate speech **G1:** 6.37 ± 4.03 **G2:** 5.75 ± 3.43 **VABS, mean ± SD:** **Standard Score** Daily living skills **G1:** 41.14 ± 19.81 **G2:** 50.79 ± 18.49 Socialization	**24 Week Follow-Up** **VABS, mean ± SD:** **Standard Score** Daily living skills **G1:** 45.34 ± 20.48 **G2:** 55.65 ± 21.86 Socialization **G1:** 56.59 ± 17.38 **G2:** 67.42 ± 18.48 Communication **G1:** 53.57 ± 20.23 **G2:** 63.90 ± 22.65 Adaptive Composite **G1:** 47.84 ± 15.81 **G2:** 57.87 ± 19.03 **Age Equivalent Score** Daily living skills **G1:** 3.49 ± 1.72 **G2:** 4.36 ± 2.25 Socialization **G1:** 2.71 ± 1.51 **G2:** 3.99 ± 2.56 Communication **G1:** 3.42 ± 2.18 **G2:** 4.58 ± 2.85 Adaptive Composite **G1:** 12.88 ± 10.83 **G2:** 8.41 ± 8.69 **One Year Follow-up**** **(**G1, n=36, G2, n=51) **HSQ-mean** **G1:** 2.12 ± 1.87

during study: ~weekly across groups **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 49 **G2:** 75 **N at follow-up (1 year):** **G1:** 36 **G2:** 51	disorder or current diagnosis of major depression, obsessive-compulsive disorder, substance abuse, or girls with positive Beta HCG pregnancy test criterion 2 **Age, mean/yrs ± SD:** **G1:** 7.5 ± 2.80 **G2:** 7.38 ± 2.21 **Mental age, mean/yrs (range):** NR **Sex, n (%):** G1+G2: M: 105 (85) F: 19 (15) **Race/ethnicity, n (%):** White/non Hispanic **G1:** 34 (69.4) **G2:** 59 (78.7) Hispanic **G1:** 7 (14.3) **G2:** 4 (5.3) African American **G1:** 7 (14.3) **G2:** 9 (12.1) Asian American **G1:** 0 **G2:** 3 (4.0) Native American **G1:** 1 (2.0) **G2:** 0 **SES, mean ± SD:**	**G1:** 53.48 ± 14.41 **G2:** 59.55 ± 15.01 Communication **G1:** 53.18 ± 19.94 **G2:** 61.15 ± 20.95 Adaptive Composite **G1:** 45.84 ± 15.5 **G2:** 53.15 ± 15.66 **Age Equivalent Score** Daily living skills **G1:** 2.85 ± 1.52 **G2:** 3.63 ± 1.94 Socialization **G1:** 2.09 ± 1.08 **G2:** 2.80 ± 1.84 Communication **G1:** 3.12 ± 2.15 **G2:** 3.99 ± 2.65 Adaptive Composite **G1:** 18.91 ± 14.18 **G2:** 16.59 ± 11.44 **Standard Observation Analog Procedure** Free Play Condition Child inappropriate mean % intervals, mean ± SD: 20 ± 23 Parent restrictive mean raw score, mean ± SD: 0.88 ± 1.72 Parent positive mean raw score, mean ± SD: 1.34 ± 2.01	**G2:** 1.84 ± 1.46 **HSQ "yes"** **G1:** 13.67± 7.04 **G2:** 12.69 ± 5.91 **ABC, mean ± SD** **I**rritability **G1:**15.25 ± 3.36 **G2:** 14.10 ± 3.60 Lethargy **G1:** 7.39 ±6.83 **G2:** 4.65 ± 5.21 Stereotypy **G1:** 5.61 ± 5.31 **G2:** 4.06 ± 3.67 Hyperactivity **G1:** 18.94 ± 11.42 **G2:** 17.37 ± 11.78 Inappropriate speech **G1:** 3.22 ± 3.36 **G2:** 3.27 ± 2.77 **Predictors, F** **HSQ Total Score** Income: 0.02 Maternal education: 0.40 Child age: 4.96 IQ: 3.18 ABC-Irritability: 1.13 ABC-Hyperactivity: 0.36 CGI-S: 0.08 CASI-ADHD/Combined: 0.02 CASI-ODD: 0.06 CASI-GAD: 0.77 CASI-Mood disorder: 0.84 CASI-PDD: 0.11 CYBOCS: 0.42

Income (US $) <20,000 **G1:** 12 ± 25.0 **G2:** 14 ± 18.7 20,001-40,000 **G1:** 14 ± 29.2 **G2:** 21 ± 28.0 40,001-60,000 **G1:** 10 ± 20.8 **G2:** 11 ± 14.7 60,001-90,000 **G1:** 7 ± 14.6 **G2:** 16 ± 21.3 >90,000 **G1:** 5 ± 10.4 **G2:** 13 ± 17.3 Maternal education <8th grade **G1:** 1 ± 2.0 **G2:** 4 ± 5.3 Some high school **G1:** 4 ± 8.2 **G2:** 3 ± 4.0 High school graduate/GED **G1:** 15 ± 30.6 **G2:** 18 ± 24.0 Some collage **G1:** 17 ± 34.7 **G2:** 28 ± 37.3 College graduate **G1:** 10 ± 20.4 **G2:** 12 ± 16.0	Child+parent social attention, mean ± SD: Child inappropriate mean % intervals, mean ± SD: 32 ± 29 Parent restrictive mean raw score, mean ± SD: 1.45 ±3.27 Parent positive raw score, mean ± SD: 0.30 ± 0.83 Demand Condition Child inappropriate mean % intervals, mean ± SD: 40 ± 27 Child mean compliance, Child inappropriate mean % intervals, mean ± SD: 75 ± 25 Parent restrictive mean raw score, mean ± SD: 1.49 ± 2.05 Parent positive raw score, mean ± SD: 1.48 ± 1.99 Parent repeated mean raw score, mean ± SD: 10.25 ± 7.15 Parent mean contingent reinforcement, mean ± SD: 39 ± 29	HSQ: 7.23 (p=0.007) PSI-Parental distress: 0.20 PSI-Total stress: 0.78 VABS-daily living: 0.18 VABS-socialization: 0.34 VABS-communication: 0.58 VABS-composite: 0.60 **ABC-Hyperactivity/Non-compliance** Income: 1.02 Maternal education:0.02 Child age: 3.23 IQ: 3.43 ABC-Irritability: 0,02 ABC-Hyperactivity: 0.31 CGI-S: 0.21 CASI-ADHD/Combined: 0.30 CASI-ODD: 0.00 CASI-GAD: 0.17 CASI-Mood disorder: 0.04 CASI-PDD: 2.47 CYBOCS: 0.38 HSQ: 0.29 PSI-Parental distress: 0.54 PSI-Total stress: 0.84 VABS-daily living: 3.62 VABS-socialization: 1.45 VABS-communication: 5.04 VABS-composite: 4.56 **Moderators, F** **HSQ Total Score** Income: 0.58 Maternal education:0.08 Child age: 0.43 IQ: 0.04 ABC-Irritability: 0.08 ABC-Hyperactivity: 0.15 CGI-S: 0.32 CASI-ADHD/Combined: 0.01

Advanced degree **G1:** 2 ± 4.1 **G2:** 10 ± 13.3 **Diagnostic approach:** In Study Diagnostic tool/method: DSM-IV-TR diagnosis based on clinical assessment and corroborated by the ADI-R **Diagnostic category, n (%):** Autism **G1:** 32 (65.3) **G2:** 49 (65.3) PDD-NOS **G1:** 13 (26.5) **G2:** 22 (29.3) Aspergers **G1:** 4 (8.2) **G2:** 4 (5.3) **Other characteristics:** **Educational placement, n (%):** F/T, regular education **G1:** 10 (20.4) **G2:** 18 (24.0) F/T, regular education with aide **G1:** 0 **G2:** 3 (4.0) Regular education, some	Tangible Restriction Condition Child inappropriate mean % intervals, mean ± SD: 42 ± 27 Parent restrictive mean raw score, mean ± SD: 2.32 ± 3.30 Parent positive raw score, mean ± SD: 1.13 ± 1.97	CASI-ODD: 3.38 CASI-GAD: 0.43 CASI-Mood disorder: 1.14 CASI-PDD: 0.39 CYBOCS: 1.96 HSQ: 2.27 PSI-Parental distress: 0.05 PSI-Total stress: 0.11 VABS-daily living: 0.12 VABS-socialization: 0.00 VABS-communication: 0.00 VABS-composite: 0.12 **ABC-Hyperactivity/Non-compliance** Income: 0.07 Maternal education: 0.67 Child age: 0.65 IQ: 0.96 ABC-Irritability: 0.04 ABC-Hyperactivity: 0.46 CGI-S: 2.13 CASI-ADHD/Combined: 0.73 CASI-ODD: 5.70 CASI-GAD: 0.84 CASI-Mood disorder: 1.92 CASI-PDD: 0.08 CYBOCS: 1.60 HSQ: 1.02 PSI-Parental distress: 0.01 PSI-Total stress: 0.00 VABS-daily living: 0.09 VABS-socialization: 0.09 VABS-communication: 0.22 VABS-composite: 0.04 **Standard Observation Analog Procedure** Free Play Condition Child inappropriate mean % intervals, mean ± SD: 17 ±21

	special **G1:** 5 (10.2) **G2:** 4 (5.3) Special education classroom **G1:** 8 (10.3) **G2:** 14 (18.7) Special elementary school **G1:** 3 (6.1) **G2:** 2 (2.7) Home school **G1:** 4 (8.2) **G2:** 5 (6.7) Special preschool **G1:** 11 (22.4) **G2:** 11 (14.7) Regular preschool **G1:** 6 (12.2) **G2:** 8 (10.7) No school **G1:** 2 (24.1) **G2:** 12 (16.0)	G1 vs. G2: p=0.17 Parent restrictive mean raw score, mean ± SD: 1.10 ± 1.79 G1 vs. G2: p=0.27 Parent positive mean raw score, mean ± SD: 2.23 ± 3.19 G1 vs. G2: p=0.004 Child inappropriate mean % intervals, mean ± SD: 29 ± 27 G1 vs. G2: p=0.41 Parent restrictive mean raw score, mean ± SD: 0.65 (1.51) G1 vs. G2: p=0.03 Parent positive raw score, mean ± SD: 0.53 ± 1.24 G1 vs. G2: 0.13 Demand Condition Child inappropriate mean % intervals, mean ± SD: 29 ± 21 G1 vs. G2: p=0.0002 Child mean complains, Child inappropriate mean % intervals, mean ± SD: 84 ± 19 G1 vs. G2: p=0.004 Parent restrictive mean raw score, mean ± SD: 1.21 ± 2.06 G1 vs. G2: p=0.39

		Parent positive raw score, mean ± SD: 2.42 ± 2.62 G1 vs. G2: p=0.001 Parent repeated mean raw score, mean ± SD: 7.33 ± 6.61 G1 vs. G2: p=<.0001 Parent mean contingent reinforcement, mean ± SD: 41 ± 25 G1 vs. G2: p=0.77 Tangible Restriction Condition Child inappropriate mean % intervals, mean ± SD: 33 ± 24 G1 vs. G2: p=0.012 Parent restrictive mean raw score, mean ± SD: 1.62 ± 2.18 G1 vs. G2: p=0.10 Parent positive raw score, mean ± SD: 1.58 ± 2.33 G1 vs. G2: p=0.09 **Modifiers** No predictors / moderators tested were significant at p<0.01

*Baseline values for HSQ and ABC extracted from Scahill 2012, which reports on entire sample.
**Mean differences in change from baseline to one-year followup for all measures was not significant

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Flanagan et al. 2012[17] **Country:** Canada **Intervention setting:** Treatment centers in the community, and children's homes **Enrollment period:** NR **Funding:** Regional Autism Programs of Ontario Network, CIHR STIHR Program **Design:** Retrospective cohort Note: See study reporting on this population[13] in 2011 AHRQ review; table includes data from comparative study only—related studies include	**Intervention:** Intensive Behavioral Intervention (IBI) for 20 and 40 h per week, except when transitioning to or from treatment with a mean duration of 27.84 months, SD = 8.11 Wait-list control group had low intensity behavioral intervention <10 h/week with a mean duration of 17.01, SD = 2.81 **Assessments:** Autism severity, adaptive and cognitive skills assessed with Childhood Autism Rating Scale (CARS), Vineland Adaptive Behavior Scale (VABS), Mullen Scales of Early Learning, Weschler Preschool Primary Scale of Intelligence or Stanford-Binet Intelligence Scale **Groups:** **G1:** IBI **G2:** Wait-List control **Provider:** Master's level psychometrists or graduate-level psychology	**Inclusion criteria:** • children who had completed IBI or left the waitlist within the previous 4 years • in IBI or on the waitlist for at least 12 months • complete information available about adaptive functioning, autism severity and cognitive skills, with all measures at the same time point completed within 3 months of one another • if on the waitlist: received fewer than 10 hours/week of IBI from private agencies • -if received IBI: received IBI for at least 80% of the interval between Time 1 and Time 2 testing **Exclusion criteria:** • received initial testing long before IBI program began • See inclusion **Age, mean ± SD/months:** **G1:** 42.93 ± 11.53 **G2:** 42.79 ± 10.51	Mean ± SD CARS **G1:** 32.83 ± 3.99 **G2:** 32.62 ± 3.74 VABS standard scores composite **G1:** 55.38 ± 7.00 **G2:** 55.49 ± 7.11 VABS Ratio scores Composite **G1:** 30.78 ± 10.78 **G2:** 30.79 ± 10.67 Communication **G1:** 25.47 ± 15.81 **G2:** 25.50 ± 11.97 Daily Living Skills **G1:** 42.79 ± 11.97 **G2:** 42.87 ± 12.11 Socialization **G1:** 24.08 ± 9.36 **G2:** 23.99 ± 11.22	Mean ± SD CARS **G1:** 30.20 ± 4.97 **G2:** 32.57 ± 5.55 Estimated marginal scores (adjusted for duration of treatment and age at time 2 and initial scores): **G1:** 30.00 **G2:** 32.77 (p= 0.033) VABS standard scores composite **G1:** 56.34 ± 14.40 **G2:** 52.19 ± 8.77 Estimated marginal score: **G1:** 56.96 **G2:** 50.66 (p=0.008) Ratio scores composite **G1:** 41.77 ± 20.26 **G2:** 31.15 ± 11.82 Estimated marginal score **G1:** 40.75 **G2:** 30.32 (p=0.002) Communication: **G1:** 46.60 ± 29.91 **G2:** 30.33 ± 16.98 Estimated marginal score: **G1:** 43.45 **G2:** 29.80 (p=0.006)

Shine 2010,[14] Freeman 2010,[15] Perry 2011,[16] Perry 2013[12]	students working under the supervision of registered psychologists **Treatment manual followed:** NR **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** NR **Co-interventions held stable during treatment:** NR **Concomitant therapies,%:** Specialized diets or special supplements: **G1:** NR **G2:** 14 Speech therapy **G1:** NR **G2:** 68 Occupational therapy **G1:** NR **G2:** 53 Behavioral consultation **G1:** NR **G2:** 34 Took medication for autism: **G1:** NR **G2:** 7	**Mental age, mean/yrs (range):** NR **Sex:** Male (%) **G1:** (87) **G2:** (84) **Race/ethnicity, n (%):** NR **SES:** **G1+G2:** Education: neither parent attending college or university: 29% , at least one parent attending college or university : 51%, at least one parent completing a professional or graduate degree: 20% Household income, mean (range): NR **Diagnostic approach:** In Study Diagnostic tool/method: CARS, in combination with clinical observation and a diagnostic and adaptive interview **Diagnostic category,%:** Autism: 50 PDD-NOS: 50 **Other characteristics**, n (%)**:** NR	Daily Living Skills: **G1:** 44.83 ± 14.01 **G2:** 40.03 ± 11.06 Estimated marginal score: **G1:** 45.04 **G2:** 38.80 (p=0.023) Socialization: **G1:** 33.90 ± 19.04 **G2:** 23.11 ± 10.85 Estimated marginal score: **G1:** 33.49 **G2:** 21.88 (p=0.001) Cognitive skills: IQ estimate **G1:** 55.80 ± 26.97 **G2:** 39.50 ± 18.93 Estimated marginal score: **G1:** 55.71 **G2:** 36.46 (p=0.002) **Harms :** NR **Modifiers :** Younger initial age predicted better cognitive outcomes in G1 but not in G2

	Low intensity (< 10 hours/week) behavioral intervention **G1:** NR **G2:** 14 **N at enrollment:** **G1:** 79 **G2:** 61 **N at follow-up:** **G1:** 61 **G2:** 61

Comments: Interval between test periods (duration) was longer for G1 so participants were older at time of second assessment. Differences in duration and age were statistically controlled for in analysis

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Ingersoll et al. 2012 [39, 40] **Country:** US **Intervention setting:** Psychology clinic **Enrollment period:** NR **Funding:** NR **Design:** RCT	**Intervention:** Reciprocal Imitation Training (RIT), 10 weeks, 1 hr/day, 3 days/week **Assessments:** parent; observation in clinic **Groups:** **G1:** Reciprocal Imitation Training (RIT) **G2:** Standard treatment **Provider:** Therapists **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** Yes **Concomitant therapies, n (%):** Outside intervention per week, mean hours ± SD: **G1:** 11.0 ± 8.1	**Inclusion criteria:** • diagnosed with autism • age between 27 and 47 months **Exclusion criteria:** • see inclusion criteria **Age, mean/months ± SD:** **G1:** 39.3 ± 7.3 **G2:** 36.5 ± 8.0 **Nonverbal mental age, mean/months ± SD:** **G1:** 20.8 ± 6.6 **G2:** 17.9 ± 7.5 **Expressive language age, mean/months ± SD:** **G1:** 17.3 ± 5.5 **G2:** 16.2 ± 5.9 **Sex:** M, n (%): **G1:** 13 (93) **G2:** 11 (85) F, n (%): **G1:** 1 (7) **G2:** 2 (15) **Race/ethnicity, n (%):** % minority status: **G1:** 36 **G2:** 39 **SES:**	**Number of spontaneous play acts (SPA):** **G1:** 30.27 ± 19.43 **G2:** 20.10 ± 13.35 **Response to joint attention (ESCS):** **G1:** 51.72 ± 22.90 **G2:** 49.50 ± 24.37 **Initiation of joint attention (ESCS):** **G1:** 2.73 ± 2.72 **G2:** 2.10 ± 3.25	**Social skills:** Social-Emotional Scale: Time x group: p = 0.02 **Communication/ language:** ESCS Initiating joint attention p < 0.05 **Elicited imitation:** **G1:** 20.64 ± 11.40 **G2:** 7.20 ± 6.65 p < 0.05 **Spontaneous imitation:** **G1:** 17.27 ± 11.56 **G2:** 4.70 ± 3.83 p < 0.05 **Harms:** NR **Modifiers:** NR

	G2: 13.2 ± 8.8	Maternal education, n (%): NR
	N at enrollment:	
	G1: 15	Household income, mean
	G2: 14	(range): NR
	N at follow-up:	**Diagnostic approach:**
	G1: 14	In Study & Referral
	G2: 13	
		Diagnostic tool/method: DSM-IV-TR criteria by psychologic & Autism Diagnostic Observation Schedule-Generic (ADOS-G)
		Diagnostic category, n (%): Autism: 29 (100) PDD-NOS: 0 Aspergers: 0
		Other characteristics, n (%): NR

Comments: Pre- and post-treatment imitation data from 22 of these children were presented in a previous publication. The original numerical data is not presented, only conclusions.

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Kaale et al. 2012[41] **Country:** Norway **Intervention setting:** clinic **Enrollment period:** October 2006 to August 2008 **Funding:** South-Eastern Norway Regional Health Authority and Center for Child and Adolescent Mental Health, Eastern and Southern Norway **Design:** RCT	**Intervention:** Joint attention intervention (modification of Kasari manual); intervention was individualized and relied on combination behavioral and developmental model. Lasted 8 week with two daily sessions (5 days/week) each session was 20 minutes—5 min of table top training and 15 min of floor play. Control group received regular preschool program **Assessments:** Mullen Scale of Early Learning (MSEL), Early Social Communication Scale (ESCS), preschool teacher-child play observed **Groups:** **G1:** Joint Attention **G2:** control **Provider:** Preschool teachers **Treatment manual followed:** Yes **Defined protocol**	**Inclusion criteria:** • chronological age 24-60 months • confirmed ICD-10 diagnosis of childhood autism • attendance in preschool **Exclusion criteria:** • central nervous system disorders (e.g epilepsy, cerebral palsy) • non Norwegian speaking parents **Age, mean/mos ± SD:** **G1:** 47.6 ± 8.30 **G2:** 50.3 ± 8.3 **Mental age, mean/mos (range):** **G1:** 25.6 ± 10.8 **G2:** 30.3 ± 12.0 **Sex:** M, n (%): **G1:** 26 (76.5) **G2:** 22 (81.5) F, n (%): **G1:** 8 (23.5) **G2:** 5 (18.5) **Race/ethnicity, n (%):** NR **SES:**	JA during ESCS **G1:** 1.3 ± 2.8 **G2:** 1.3 ± 1.8 JA during teacher-child play **G1:** 0.7 ± 1.3 **G2:** 0.4 ± 1.1 JE during teacher-child play (%) **G1:** 53.1 ± 23.1 **G2:** 58.0 ± 23.8 JA during mother-child play **G1:** 1.1 ± 1.6 **G2:** 1.4 ± 2.0 JE during mother-child play (%) **G1:** 45.1 ± 23.4 **G2:** 50.2 ± 21.7	JA during ESCS **G1:** 1.6 ± 2.6 **G2:** 1.6 ± 2.2 p=0.99 JA during teacher-child play **G1:** 1.8 ± 3.2 **G2:** 0.4 ± 0.7 p=0.036 JE during teacher-child play (%) **G1:** 56.0 ± 22.2 **G2:** 62.7 ± 20.9 p=0.53 JA during mother-child play **G1:** 2.4 ± 3.6 **G2:** 1.8 ± 3.2 p=0.09 JE during mother-child play (%) **G1:** 57.3 ± 22.8 **G2:** 49.2 ± 19.9 p=0.015 **Harms:** NR **Modifiers:** Chronological age, language age, DQ and program philosophy did NOT moderate the effect of JA intervention

followed: Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 34 **G2:** 27 **N at follow-up:** **G1:** 34 **G2:** 27	**Mean education level (scale 1-5)** **G1:** 3.2 ± 1.3 **G2:** 3.5 ± 1.0 **Diagnostic approach:** In Study/Referral Diagnostic tool/method: Comprehensive clinical evaluation; 80% tested with ADOS and/or ADI-R **Diagnostic category, n (%):** Autism :100% **Other characteristics, n (%):** Developmental quotient mean ± SD: **G1:** 53.3 ± 19.2 **G2:** 59.9 ± 19.7 Receptive language age, mean/mos ± SD: **G1:** 21.0 ± 10.3 **G2:** 25.8 ± 11.7 Expressive language age, mean/mos ± SD: **G1:** 18.8 ± 10.5 **G2:** 24.9 ± 12.8 **Preschool placement, n (%)** Mainstream preschool **G1:** 30 (88) **G2:** 24 (89) ASD-unit in mainstream

	pre-school **G1:** 2 (6) **G2:** 2 (7) ASD preschool **G1:** 2 (6) **G2:** 1 (4) Program philosophy ABA-based program **G1:** 20 (59) **G2:** 12 (44) Eclectic program **G1:** 14 (41) **G2:** 15 (56) Hours/week in school **G1:** 36.4 ± 5.7 **G2:** 38.4 ± 3.6 1:1 training hours/week **G1:** 11.0 ± 5.2 **G2:** 10.7 ± 6.9 1:1 support in group hrs/week **G1:** 19.2 ± 7.6 **G2:** 19.0 ± 7.3 Ordinary group hr/week **G1:** 6.1 ± 7.9 **G2:** 10.0 ± 7.7

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Kasari et al., 2012 [42, 43] **Country:** US **Intervention setting:** Clinic **Enrollment period:** NR **Funding:** NIH grant **Design:** RCT *Note: see data from earlier studies[44, 45] reporting on this population in 2011 AHRQ review[9]	**Intervention:** Joint attention intervention: Goal to increase child's joint attention initiations during novel play routines. Symbolic play intervention to increase child's level and frequency of play acts according to play scale adapted from Lifter. Treatment sessions held every day for 5-6 weeks. Control group received standard treatment (ABA) **Assessments:** Early Language Communication Scale (ESCS); Mullen Scales of Early Learning; Reynell Developmental Language Scales **Groups:** **G1:** joint attention intervention **G2:** symbolic play **G3:** control **Provider:** see Kasari et al 2006 **Treatment manual followed:** Yes	**Inclusion criteria:** • Diagnosis of autism on the ADI-R and ADOS • Age < 5 years old • Accessible for follow-up **Exclusion criteria:** • Seizures • Additional medical diagnoses (e.g., genetic syndromes) • Geographically inaccessible for follow-up visits • Did not plan to stay in the early intervention program for at least 4 weeks **Age, mean/mos ± SD:** **G1:** 43.05 ± 6.863 **G2:** 41.41 ± 6.491 **G3:** 41.31 ± 4.542 **Mental age, mean/ mos ± SD:** **G1:** 26.29± 8.713 **G2:** 26.59 ± 7.550 **G3:** 22.05 ± 9.532 **Sex:** M, n (%): **G1:** 15 (75) **G2:** 11 (69) **G3:** 14 (87.5)	Joint attention and shared positive effect, mean ± SD: **G1:** 3.25± 5.37 **G2:** 3.25 ± 4.38 **G3:** 4.50 ± 6.57 Joint attention and shared positive effect and utterance (s) , mean ± SD: **G1:** 1.05± 2.44 **G2:** 1.56 ± 4.00 **G3:** 2.50 ± 4.56	At 6 month follow-up Joint attention and shared positive effect, mean ± SD: **G1:** 6.15± 5.72 **G2:** 7.91 ± 3.06 **G3:** 3.06 ± 4.39 Joint attention and shared positive effect and utterance, mean ± SD: **G1:** 4.10± 4.64 **G2:** 3.19 ± 3.58 **G3:** 1.75 ± 3.38 At 12 month follow-up Joint attention and shared positive effect, mean ± SD: **G1:** 7.65± 6.80 **G2:** 9.44 ± 3.88 **G3:** 3.88 ± 5.32 Joint attention and shared positive effect and utterance (s) , mean ± SD: **G1:** 5.30± 5.68 **G2:** 5.75 ± 7.02 **G3:** 1.56 ± 3.10 At 5 years follow-up (n=40/58): Cognitive and language ability: >30 Months:

	F, n (%):	**G1:** 13 (87%)
Defined protocol followed: Yes	**G1:** 5 (25) **G2:** 5 (31) **G3:** 2 (12.5)	**G2:** 11 (79%) **G3:** 8 (73%) total: 32 (80%), p=0.67
Measure of treatment fidelity reported: Yes	**Race/ethnicity, n (%):**	DAS (standard score):
	White	**G1:**93.5 (22.32)
Co-interventions held stable during treatment: NR	**G1:** 16 (80) **G2:** 12 (75) **G3:** 9 (56.3)	**G2:**87.73 (17.96) **G3:**89.23 (13.13) total: 90.44 (18.51) p=0.75
Concomitant therapies, n (%): NR	Minority	
	G1: 4 (20)	EVT (standard score):
N at enrollment:	**G2:** 4 (25)	**G1:**86.5 (18.9)
G1: 20	**G3:** 7 (43.7)	**G2:**86.4 (19.3)
G2: 21		G3:80.5 (22.3)
G3: 17	**SES:**	total: 85.0(19.4), p=0.77
	Maternal education, n (%):	
N at follow-up:	High school	Baseline play predicting spoken language at 5 years (X^2= 18.15, p< .01, R^2 = 0.58).and cognitive scores at 8 years of age (functional play types- (F1,30=14.62, p<0.01)). For a 1-unit increase in functional play types, there was a 2.12 (SE 0.55) standard score increase on the DAS.
G1: 20	**G1:** 0	
G2: 16	**G2:** 0	
G3: 16	**G3:** 1	
At 5 years follow-up:	Some College/technical	
G1:15	**G1:** 2	
G2:14	**G2:** 3	
G3:11	**G3:** 4	
	College/professional	
	G1: 18	
	G2: 13	
	G3: 11	Children gained a standard score of 1.1 (SE =0.3) in spoken vocabulary ability per month that they enter the treatment earlier and they gain a standard score of 2.1 (SE =0.9) in spoken vocabulary ability per
	Household income, mean (range): NR	
	Diagnostic approach:	
	In Study/Referral	
	Diagnostic tool/method: ADOS/ADI-R	

	Diagnostic category, n (%): Autism (100) **Other characteristics**, n (%)**:** **Expressive language age, mean/ mos ± SD:** **G1:** 20.6± 6.508 **G2:** 23.18 ± 7.418 **G3:** 19.75 ± 7.819 **Receptive language age, mean/ mos ± SD:** **G1:** 20.55± 7.272 **G2:** 23.35 ± 9.380 **G3:** 17.94 ± 8.813	one frequency increase in joint attention initiations G1 scored an average of 12.5 (SE =5.8) points higher than G3 on the language measure, and G2 scores an average of 10.6 (SE = 6.2) points higher on the language measure than G3. No group difference (p=0.61). **Harms:** NR **Modifiers** Interactions of group and time were found for both types of joint attention quality.

Comments: Used data from previous published RTC (Kasari et al 2006); Original study had 58 participants; 6 were not included in this analysis because portions of their ESCS data were missing.
Kasari et al 2012 followed 40/58 children at 5 years and 8 years after intervention

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Kasari et al. 2012[46] **Country:** US **Intervention setting:** School **Enrollment period:** August 2003 to September 2007 **Funding:** NIMH, HRSA, NCT **Design:** RCT	**Intervention**: Child-assisted approach: Children with ASD given 20 min twice weekly sessions for 6 weeks with direct instruction, to develop strategies to engage socially with their peers Peer-mediated: Three classroom peers of child with ASD taught strategies for engaging children with social challenges on the playground. Training given for 20 min twice weekly sessions for 6 weeks **Assessments:** Social Network Survey, Teacher perception of social skills (TPSS), Playground observation of peer engagement, behavioral assessment (direct observations, and peer, self and teacher reports) **Groups *:** G1: CHILD-assisted G2: PEER-mediated G3: Both PEER and CHILD Interventions	**Inclusion criteria:** • met criteria for ASD on the ADI–R and ADOS administered by blind, • independent psychologists • fully included in a • regular education classroom for at least 80% of the school day • between the ages of 6–11 years old • in grades 1–5 • IQ of 65 or higher • did not have additional • diagnoses **clusion criteria:** See inclusion **Age, mean ± SD:** 8.14 years ± 1.56 **Mental age, mean ± SD:** IQ: 90.97 ± 16.33 **Sex:** M, 90 % F, 10 % **Race/ethnicity, n (%):** Caucasian 46.6%, African American, 5%	**Mean ± SD** Social network Salience: **Assigned to CHILD:** 0.26 ± 0.22 **Not assigned to CHILD:** 0.38 ± 0.26 **Assigned to PEER:** 0.35 ± 0.29 **Not assigned to PEER:** 0.29 ± 0.19 Received friendship nominations (range 0–8) **Assigned to CHILD:** 1.23 ± 1.48 **Not assigned to CHILD:** 1.80 ± 1.83 **Assigned to PEER:** 1.80 ± 2.01 **Not assigned to PEER:** 1.23 ± 1.22 Outward nominations (range 0–15) **Assigned to CHILD:** 4.27 ± 2.89	**Mean ± SD** Social network salience **Assigned to CHILD:** 0.46 ± 0.29, 0.34 ± 0.25 **Not assigned to CHILD:** 0.37 ± 0.21, 0.37 ± 0.30 **Assigned to PEER:** 0.51 ± 0.29, 0.41 ± 0.29 **Not assigned to PEER:** 0.32 ± 0.18, 0.30 ± 0.25 children who received both the CHILD and PEER interventions had significantly higher SNS scores (M = 0.60; SD = 0.30) when compared to children who received the CHILD intervention (M = 0.31; SD = 0.21), t(28) =)2.99, p = .006, d = 1.12, as well as those who received neither CHILD nor PEER intervention (M = 0.32; SD = 0.15), t(28) = 3.23, p = .003, d = 1.18. Received friendship nominations

G4: Neither PEER nor CHILD **Provider:** Graduate students in Educational Psychology **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR N at enrollment: **G1:** 15 **G2:** 15 **G3:** 15 **G4:** 15 **N at follow-up:** **G1:** 14 **G2:** 15 **G3**: 15 **G4:** 15	Latino,21.7% Asian: 16.7% Other: 10% **SES:** NR **Diagnostic approach:** NR Diagnostic tool/method: ADI-R, ADOS **Diagnostic category, n (%):** ASD: 100 **Other characteristics**, n**:** first grade: 15 second grade: 18 third grade: 8 fourth grade: 11 fifth grade: 8	**Not assigned to CHILD:** 3.43 ± 2.49 **Assigned to PEER:** 4.17 ± 2.93 **Not assigned to PEER:** 3.53 ± 2.47 Rejection nominations (range 0–9) **Assigned to CHILD:** 1.71 ± 2.02 **Not assigned to CHILD:** 1.69 ± 1.85 **Assigned to PEER:** 2.17 ± 2.07 **Not assigned to PEER:** 1.19 ±1.62 Reciprocal friendships (%age) (range 0–100) **Assigned to CHILD:** 6.25 ± 25.00 **Not assigned to CHILD:** 18.18 ± 40.45 **Assigned to PEER:** 13.33 ± 35.19 **Not assigned to PEER:** 8.33 ± 28.87 Teacher perceptions	(range 0–8) **Assigned to CHILD:** 2.00 ± 2.10, 1.41 ± 1.52 **Not assigned to CHILD:** 2.33 ± 1.49, 1.53 ± 1.55 **Assigned to PEER:** 2.80 ± 1.96, 1.73 ± 1.76 **Not assigned to PEER:** 1.53 ± 1.43, 1.21 ± 1.21 **Outward nominations (range 0–15)** **Assigned to CHILD:** 4.67 ± 2.20, 4.10 ± 2.43 **Not assigned to CHILD:** 4.43 ± 3.22, 3.40 ± 2.19 **Assigned to PEER:** 4.63 ± 2.28, 4.10 ± 2.54 **Not assigned to PEER:** 4.47 ± 3.17, 3.38 ± 2.04 Rejection nominations (range 0–9) **Assigned to CHILD:** 2.11 ± 2.82, 2.15 ± 2.54 **Not assigned to CHILD:** 2.03 ± 1.80, 1.93 ± 1.91 **Assigned to PEER:** 2.37 ± 2.25, 2.40 ± 2.27 **Not assigned to PEER:**

	Assigned to CHILD: 23.31 ± 4.61 **Not assigned to CHILD:** 23.31 ± 3.63 **Assigned to PEER:** 23.13 ± 4.02 **Not assigned to PEER:** 23.51 ± 4.27 Solitary engagement Mean (SD): Child: 0.36 ± 0.29 Peer: 0.34 ± 0.29 Joint engagement Mean (SD): Child: 0.41 ± 0.34 Peer: 0.43 ± 0.34	1.74 ± 2.43, 1.62 ± 2.12 Reciprocal friendships (%age) (range 0–100) **Assigned to CHILD:** 15.79 ± 37.46 12.50 ± 34.16 **Not assigned to CHILD:** 13.33 ± 35.19 5.56 ± 23.57 **Assigned to PEER:** 13.64 ± 35.13 10.00 ± 30.78 **Not assigned to PEER:** 16.67 ± 38.93 7.14 ± 26.73 Teacher perceptions **Assigned to CHILD:** 24.18 ± 3.33 24.76 ± 4.05 **Not assigned to CHILD:** 24.62 ± 4.47 23.97 ± 4.20 **Assigned to PEER:** 25.19 ± 3.45 24.95 ± 3.72 **Not assigned to PEER:** 23.49 ± 4.26 23.61 ± 4.50 End of Treatment:

							Solitary engagement Mean (SD): Child: 0.33 ± 0.27) Peer: 0.28 ± 0.26) Joint engagement Mean (SD): Child: 0.43 ± 0.27 Peer: 0.44 ± 0.31 Follow-up: Solitary engagement Mean (SD): Child: 0.33 ± 0.30 Peer: 0.19 ± 0.24 Joint engagement Mean (SD): Child: 0.43 ± 0.35 Peer: 0.51 ± 0.34 **Harms:** NR **Modifiers:** NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Landa et al. 2011[47, 48] **Country:** US **Intervention setting:** Classroom at autism center **Enrollment period:** NR **Funding:** National institutes of Mental Health;lHealth Resources and Services Agency **Design:** RCT	**Intervention:** Interpersonal synchrony (IS) four days per week for 2.5 hours / day for 6 months, home-based parent training (1.5 hours per month), parent education (38 hours), and instructional strategies, + supplementary social curriculum. Non-interpersonal synchrony includes everything as in the IS group except supplementary curriculum Both groups received Assessment, Evaluation, and Programming System for Infants and Children (AEPS) curriculum. **Assessments:** Communication and Symbolic Behavior Scales Developmental Profile to measure initiation of joint attention (JA) and shared positive affect (SPA). Socially engage imitation (SEI) Socially engaged imitation (SEI) coded from videotapes of structured imitation task. MSEL Expressive Language	**Inclusion criteria:** • meeting criteria on the ADOS for ASD or autism and receiving ASD diagnosis by expert clinician • chronological age between 21-33 months • non-verbal mental age at least 8 months per Mullen Scales of Early Learning Visual Reception Scale • no siblings with ASD • English primary language spoken at home • no known etiology for ASD **Exclusion criteria:** • see inclusion **Age, mean ± SD/ months (range):** Range: 21-33 months G1: 28.6 ± 2.6 G2: 28.8 ± 2.8 **Mental age:** NR **Sex, n (%):** Males: **G1:** 20 (83.3) **G2:** 20 (80)	**Primary outcomes, mean ±SD** SEI**:** **G1:** 0.17 ± 0.19 **G2:** 0.25 ± 0.24 IJA : **G1:** 2.29 ± 3.16 **G2:** 2.79 ± 3.62 SPA: **G1:** 2.42 ± 2.93 **G2:** 3.54 ± 3.56 **Secondary Outcomes, mean ± SD** EL T scores: **G1:** 23.92 ± 5.50 **G2:** 25.92 ± 8.12 VR T scores: **G1:** 27.50 ± 8.27 **G2:** 31.12 ± 9.86	Post-test: SEI: **G1:** 0.42 ± 0.24 **G2:** 0.35 ± 0.23 IJA: **G1:** 7.70 ± 9.33 **G2:** 5.00 ± 7.91 SPA: **G1:** 6.87 ± 7.55 **G2:** 5.33 ± 6.64 EL T: **G1:** 34.08 ± 14.59 **G2:** 31.92 ± 13.67 VR T: **G1:** 36.75 ± 14.54 **G2:** 32.24 ± 14.07 At 6 month follow-up: Group Difference effect size (p value); SEI: 0.86 (0.01) IJA: 1.56 (0.07) SPA:0.81 (0.27) EL T: 0.57 (0.24) VR T: 0.46 (0.33) Growth trends: Difference between G1 & G2: Baseline to post-test: Effect size (p value): SEI: 76 (0.04) IJA: 0.93 (0.11)

(EL) and VR. Assessments were conducted pre-intervention, immediately post-intervention, and at six-month follow-up. **Groups:** **G1:** Interpersonal synchrony (IS) G2: Non-interpersonal synchrony (Non-IS) **Provider:** Interventionists (Master's level teacher and teaching assistants) **Treatment manual followed:** NR **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):**# hrs of Speech Language treatment (pre to post): G1:24.45 (19.38) G2:21.38 (16.20) # hrs of Speech Language treatment (post to follow-up):	Females: **G1:** 4 (16.7) **G2:** 5 (20) **Race/ethnicity, n (%):** Caucasian **G1:**19 (79.2) **G2:**19 (79.2) **SES:** Maternal education: NR Household income, Hollingshead SES score, mean ± sd G1: 54.7 ± 8.7 G2: 53.3 ± 10.3 **Diagnostic approach:** In Study Diagnostic tool/method: Expert clinician **Diagnostic category, n (%):** Autism: 100% ? **Other characteristics**, n (%)**:** NR	SPA:0.83 (0.17) EL T: 0.60 (0.13) VR T: 0.84 (0.02) Post-test to follow-up; SEI: 0.43 (0.24) IJA: 0.68 (0.25) SPA:0.41 (0.52) EL T: 0.09 (0.83) VR T: -0.10 (0.78) T1–T4 change: n, mean ± SD: IQ: N= 42, 21.4 ± 22.9, d= 1.02, p<0.001 Vineland Communication Domain standard score: N= 46, 12.7 ± 19.4 , d=0.81, p<0.001 ASD severity: N= 47, 0.1 ±2.5, d= 0.05, p=NS **Harms:** NR **Modifiers:** NR

G1:28.07 (27.01)
G2:26.26 (18.82)

N at enrollment:
G1: 25
G2: 25

N at follow-up:
G1: 24
G2: 24

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Lawton et al. 2012 [49] **Country:** US **Intervention setting:** Preschool classrooms **Enrollment period:** Fall 2008 to Fall 2009 **Funding:** NR **Design:** RCT	**Intervention:** Joint Attention and Symbolic Play/Engagement and Regulation Intervention (JASP/ER) for 6 weeks; teachers received training once/week; interventionists met with the dyads twice/week for 30 minutes **Assessments:** Class observation; Early Social Communication Scales (ESCS); taped play interaction **Groups:** **G1:** JASP/ER intervention **G2:** Delayed treatment with standard practice **Provider:** Preschool teachers **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:**	**Inclusion criteria for child:** • school district label of autism or autism spectrum disorder (ASD) • met research criteria for autism or ASD on the Autism Diagnostic Observation System-Generic • between 3-5 years of age • attended public preschool at least 4 hours a day, 3 times a week • attends a classroom with a teacher willing to participate in the study **Inclusion criteria for teacher or paraprofessional:** • able to work with one child in the classroom through the entire study • available to attend the intervention meetings **Exclusion criteria:**	**Social skills:** Engagement States Duration of engagement states in minutes: Object engagement, mean ± SD: **G1**: 4.12 ± 1.99 **G2**: 4.28 ± 1.71 Supported engagement, mean ± SD: **G1**: 4.27 ± 1.77 **G2**: 3.94 ± 1.89 **Communication/ language:** Class observation Frequency of joint attention initiations (IJAs): Total IJA, mean ± SD: **G1**: 1.67 ± 2.60 **G2**: 2.43 ± 2.51 Point, mean ± SD: **G1**: 1.33 ± 2.59 **G2**: 0.29 ± 0.49 Show, mean ± SD: **G1**: 0.33 ± 0.50 **G2**: 0.71 ±1.11 Give, mean ± SD: **G1**: 0.00 ± 0.00 **G2**: 0.71 ± 1.25 Look, mean ± SD: **G1**: 0.00 ± 0.00	**Social skills:** Engagement States Duration of engagement states in minutes: Object engagement, mean ± SD: **G1**: 2.87 ± 1.31 **G2**: 4.94 ± 1.71 p < 0.01 Supported engagement, mean ± SD: **G1**: 5.58 ± 4.11 **G2**: 4.11 ± 1.68 p < 0.05 **Communication/ language:** Class observation Frequency of joint attention initiations (IJAs): Total IJA, mean ± SD: **G1**: 7.00± 4.15 **G2**: 1.83 ± 1.00 p < 0.005 Point, mean ± SD: **G1**: 2.77 ± 1.99 **G2**: 0.14 ± 0.38 p < 0.005 Show, mean ± SD: **G1**: 1.11 ± 1.05 **G2**: 0.00 ±0.00 p < 0.01 Give, mean ± SD:

NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 9 dyads (dyad= 1 instructor and student) **G2:** 7 dyads **N at follow-up:** **G1:** 9 dyads **G2:** 7 dyads	• children with seizures, associated physical disorders, or co-morbidity with other syndromes or diseases **Age, mean/months ± SD:** **G1:** 46.0 ± 5.00 **G2:** 43.01 ± 6.00 **Mental age, mean/months SD:** **G1:** 30.3 ± 5.01 **G2:** 33.8 ± 8.74 **Sex:** NR **Race/ethnicity, n (%):** Child: Caucasian: **G1:** 4 (44.4) **G2:** 5 (71.4) Minority: **G1:** 5 (55.6) **G2:** 2 (28.6) Instructor: Caucasian: **G1:** 7 (77.8) **G2:** 3 (42.9) Minority: **G1:** 2 (22.2) **G2:** 4 (57.1) **SES:** NR **Diagnostic approach:** Diagnostic tool/method:	**G2**: 0.71 ± 1.11 ESCS Frequency of Joint Attention Initiations (IJAs): Total IJA, mean ± SD: **G1**: 11.89 ± 10.01 **G2**: 13.29 ± 7.34 Point, mean ± SD: **G1**: 5.78 ± 5.70 **G2**: 7.57 ± 5.09 Show, mean ± SD: **G1**: 1.13 ±1.81 **G2**: 0.43 ± 0.79 Give, mean ± SD: **G1**: 0.33 ± 1.00 **G2**: 0.14 ± 0.38 Look, mean ± SD: **G1**: 4.78 ± 4.52 **G2**: 5.14 ± 3.53 Taped play interaction Frequency of joint attention initiations : Total IJA, mean ± SD: **G1**: 4.78 ± 3.05 **G2**: 7.29 ± 6.04 Point, mean ± SD: **G1**: 2.33 ± 2.29 **G2**: 2.14 ± 2.19 Show, mean ± SD: **G1**: 1.44 ± 3.25 **G2**: 0.71 ± 1.25 Give, mean ± SD: **G1**: 0.56 ± 0.73 **G2**: 0.29 ± 0.49	**G1**: 2.22 ± 2.49 **G2**: 0.14 ± 0.38 p=NS Look, mean ± SD: **G1**: 0.89 ± 1.45 **G2**: 0.71 ± 1.89 p=NS ESCS frequency of joint attention initiations (IJAs): Total IJA, mean ± SD: **G1**: 15.33 ± 10.89 **G2**: 9.00 ± 7.23 p=NS Point, mean ± SD: **G1**: 8.67 ± 9.66 **G2**: 4.29 ± 6.24 p=NS Show, mean ± SD: **G1**: 1.00 ±0.87 **G2**: 0.00 ± 0.00 p=0.025 Give, mean ± SD: **G1**: 1.44 ± 3.61 **G2**: 0.43 ± 1.13 p=NS Look, mean ± SD: **G1**: 4.22 ± 1.99 **G2**: 4.29 ± 5.02 p=NS Taped play interaction frequency of joint attention initiations (IJAs): Total IJA, mean ± SD: **G1**: 6.22 ± 5.19 **G2**: 4.00 ± 2.31

	Autism Diagnostic Observation System-Generic (ADOS-G) **Diagnostic category, n (%):** Autism: 100% PDD-NOS: 0 Aspergers: 0 **Other characteristics**, n (%)**:** Instructors Teacher: **G1:** 2 (22.2) **G2:** 2 (28.6) Paraprofessional, n: **G1:** 7 (77.8) **G2:** 5 (71.4) Instructor years of experience, mean ± SD: **G1:** 12.8 ± 12.5 **G2:** 7.33 ± 9.29 Instructor age, mean/yrs ± SD: **G1:** 42.3 ± 16.3 **G2:** 34.3 ± 16.9	Look, mean ± SD: **G1**: 0.44 ± 0.73 **G2**: 4.14 ± 5.33	p=NS Point, mean ± SD: **G1**: 1.11 ± 1.57 **G2**: 1.29 ± 1.89 p=NS Show, mean ± SD: **G1**: 1.77 ± 2.63 **G2**: 0.29 ± 0.49 p=NS Give, mean ± SD: **G1**: 1.11 ± 1.69 **G2**: 0.71 ± 1.11 p=NS Look, mean ± SD: **G1**: 2.22 ± 2.99 **G2**: 1.71 ± 2.56 p=NS **Harms:** NR **Modifiers:** NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Lerner et al. 2012[50] **Country:** US **Intervention setting:** After-school? **Enrollment period:** NR **Funding:** Jefferson Scholars' Foundation Graduate Fellowship **Design:** RCT	**Intervention:** Sociodramatic Affective Relational Intervention (SDARI) 90 minute meetings once/week for 4 weeks; each session included two 40 minute sessions using abridged versions of the curricula Skillstreaming: 90 minute meetings once/week for 4 weeks; each session included two 40 minute sessions using abridged versions of the curricula **Assessments:** parents completed standardized measures of children's social functioning before and after SSI; intervention staff completed standardized measure of social functioning after first and last session. Social Interaction observation system (SIOS) and sociometrics; Social Skill rating system – teacher (SSRS-T) Parent reported: SCQ, SRS, Social Skills Rating System- Parent (SSRS-P) And post-treatment satisfaction questionnaire	**Inclusion criteria:** • previous diagnosis of HFASD from a licensed professional • clinical cutoff scores on SCQ **Exclusion criteria:** NR **Age, mean/yrs (range):** **G1:** 10.86 ± 1.68 **G2:** 11.33 ± 1.63 **Mental age, mean/yrs (range):** NR **Sex:** M, 13 (100%): **Race/ethnicity, n (%):** White Asian **SES:** Parental education[a], mean ± SD : **G1:** 5.43 ± 0.79 **G2:** 5.33 ± 0.82 Household income, mean (range): **G1:** $70,000 ± $27,080 **G2:** $86,700 ± $19,660 **Diagnostic approach:** In Study/Referral Diagnostic tool/method:	**Social Skills** SRS, mean ± SD **G1:** 76.57 ± 10.47 **G2:** 82.17 ± 10.68 SSRS parent, mean ± SD **G1:** 77.57 ± 8.70 **G2:** 82.33 ± 17.76 Reciprocated friend nominations, mean ± SD **G1:** 0.14 ± 0.12 **G2:** 0.13 ± 0.10 Social preference, mean ± SD **G1:** 0.43 ± 0.30 **G2:** 0.00 ± 0.31 SSRS- Teacher, mean ± SD **G1:** 80.43 ± 11.87 **G2:** 73.17 ± 19.17 SIOS- Positive, mean ± SD **G1:** 0.69 ± 0.54 **G2:** 0.43 ± 0.35 SIOS- Negative, mean ± SD **G1:** 0.18 ± 0.21 **G2:** 0.05 ± 0.13 SIOS- Low level, mean ± SD **G1:** 1.63 ± 0.52 **G2:** 1.34 ± 0.81	**Social Skills** SRS, mean ± SD **G1:** 75.57 ± 13.05 **G2:** 76.17 ± 9.56 SSRS parent, mean ± SD **G1:** 79.71 ± 9.59 **G2:** 82.33 ± 15.65 Reciprocated friend nominations, mean ± SD **G1:** 0.24 ± 0.09 **G2:** 0.27 ± 0.21 Social preference, mean ± SD **G1:** 0.29 ± 0.44 **G2:** 0.43 ± 0.46 SSRS- Teacher, mean ± SD **G1:** 94.00 ± 13.92 **G2:** 88.17 ± 13.80 SIOS- Positive, mean ± SD **G1:** 0.37 ± 0.29 **G2:** 1.00 ± 0.45 SIOS- Negative, mean ± SD **G1:** 0.05 ± 0.09 **G2:** 0.28 ± 0.25 SIOS- Low level, mean ± SD **G1:** 1.41 ± 0.62

Groups: **G1:** SDARI **G2:** Skillstreaming **Provider:** Intervention staff members, who received 3 hours training in intervention and weekly supervision in intervention administration and behavior management **Treatment manual followed:** Yes **Defined protocol followed:** NR **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 7 **G2:** 6 **N at follow-up:** **G1:** NR **G2:** NR	**Diagnostic category, n (%):** Autism **G1:** 0 **G2:** 2 (33) PDD-NOS **G1:** 1 (14) **G2:** 1 (17) Asperger syndrome **G1:** 6 (86) **G2:** 3 (50) **Other characteristics, n (%):** Grade **G1:** 5.29 ± 1.50 **G2:** 5.33 ± 2.07 SCQ, mean ± SD **G1:** 17.57 ± 3.55 **G2:** 16.83 ± 6.27	**G2:** 1.42 ± 0.36 **Harms:** NR **Modifiers:** NR

Comments: [a] Parental education scale: 1= 8th grade or less, 2= some high school, 3= some college, 4= some college, 5= college graduate and 6= graduate degree

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Reaven et al. 2012[51] **Country:** US **Intervention setting:** clinic **Enrollment period:** NR **Funding:** Cure Autism Now, Autism Speaks, USDHHS grants **Design:** RCT	**Intervention:** Facing Your Fears (FAF) 12 multifamily group sessions, 1 ½ hours, supported by manuals for facilitators, parents and youth. Duration of intervention was 4 months **Assessments:** ADOS, Anxiety Disorders Interview Schedule for Children – parent version; Clinical Global Impressions Scale-Improvement ratings **Groups:** **G1:** facing your fears **G2:** control (usual treatment) **Provider:** 13 clinicians **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** Yes, n	**Inclusion criteria:** • chronological age between 7 and 14 years • confirmed diagnosis of ASD, determined by one of three expert clinical psychologists using recent ADOS and SCQ • speaking in full complex sentences reflected in recent standardized cognitive assessment • clinically significant symptoms of anxiety (score above clinical significance cutoff on separation, social and/or generalized anxiety subscales of the SCARED **Exclusion criteria:** • see above **Age, mean ± SD months:** **G1:** 125.75 ± 21.47 **G2:** 125.00 ± 20.45 **Mental age, mean/yrs (range):** NR **Sex:** M, n (%) **G1:** 24 (100)	**Anxiety Disorders Interview schedule for children** Separation **G1:** 2.45 ± 2.33 (0-5) **G2:** 2.22 ± 2.49 (0-6) Social **G1:** 3.85 ± 2.13 (0-6) **G2:** 3.70 ± 2.36 (0-7) Specific phobia **G1:** 3.45 ± 2.35 (0-7) **G2:** 3.09 ± 2.09 (0-6) Generalized anxiety **G1:** 4.46 ± 2.02 (0-7) **G2:** 5.09 ± 1.44 (0-7) ADIS-P principal anxiety diagnoses (SAP, SOC, GAD, SpP) **G1:** 2.90 ± 0.91 (1-4) **G2:** 2.91 ± 0.95 (1-4)	**Anxiety Disorders Interview schedule for children** Separation **G1:** 1.05 ± 1.90 (0-5) **G2:** 1.87 ± 2.70 (0-7) Social **G1:** 2.40 ± 2.30 (0-5) **G2:** 3.61 ± 2.55 (0-7) Specific phobia **G1:** 1.88 ± 1.80 (0-6) **G2:** 3.65 ± 1.70 (0-6) Generalized anxiety **G1:** 2.55 ± 2.50 (0-6) **G2:** 4.61 ± 1.70 (0-7) ADIS-P principal anxiety diagnoses (SAP, SOC, GAD, SpP) **G1:** 2.25 ± 0.91 (1-4) **G2:** 2.83 ± 0.98 (1-4) **Harms:** NR **Modifiers:** NR

G1: 23
G2: 23

Concomitant therapies, n (%):
Psychiatric medication use - any
G1: 10
G2: 14

SSRI
G1: 5
G2: 7

Atypical antipsychotic
G1: 4
G2: 3

Stimulant
G1: 5
G2: 4

Anticonvulsants
G1: 1
G2: 3

Alpha-blockers
G1: 1
G2: 5

Mood stabilizers
G1: 0
G2: 1

N at enrollment:
G1: 24
G2: 26

N at follow-up:
G1: 21
G2: 26

G2: 24 (92.3)
F, n (%)
G1: 0
G2: 2 (7.7)

Race/ethnicity, n (%):
White
G1: 22 (91.7)
G2: 20 (76.9)

Asian/Pacific Islander
G1: 0
G2: 1 (3.8)

African-American
G1: 1 (4.2)
G2: 2 (7.7)

Multi-racial
G1: 1 (4.2)
G2: 3 (11.5)

SES:
Maternal education:
Graduated from college, n(%):
G1: 15 (62.5)
G2: 15 (57.7)

Diagnostic approach:
In Study/Referral

Diagnostic tool/method:

Diagnostic category, n (%):
Autistic disorder
G1: 16 (67.7)
G2: 15 (58.9)

PDD-NOS

	G1: 0 **G2:** 3 (11.5)
N for analysis (ITT): **G1:** 24 **G2:** 26	Asperger syndrome **G1:** 8 (33.3) **G2:** 8 (30.8)
	Other characteristics: **Full scale IQ estimate, mean ± SD (range):** **G1:** 107.08 ± 16.85 (70-139) **G2:** 102.23 ± 17.33 (70-134)
	Verbal IQ, mean ± SD (range): **G1:** 107.00 ± 19.51 (65-133) **G2:** 100.73 ± 18.98 (67-134)
	Nonverbal IQ, mean ± SD (range): **G1:** 109.67 ± 16.38 (75-133) **G2:** 105.04 ± 17.86 (70-134)
	# Psychiatric diagnoses other than ASD **G1:** 1-7 **G2:** 2-8

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Reed et al. 2012[52] **Country:** UK **Intervention setting:** School/home **Enrollment period:** NR **Funding:** NR **Design:** Cohort	**Intervention:** ABA: Followed well-recognized ABA procedures of discrete trial type. Overseen by trained supervisors and conducted by trained tutors in accordance with appropriate intervention manuals. All programs were home-based and mainly 1:1 with mean intensity of 30 hours/wk. Special Nursery Placement: 7 schools in south east England. Children taught in classes of 6-8, under supervision of teacher with postgraduate qualifications and specialist training. Portage: Home based program for preschool children with special ed needs, conducted in three authorities in south-east England. Relatively low-intensity (mean 8.5 hours/week) with majority of work conducted 1:1; supervised by trained portage supervisor with graduate level qualification and followed	**Inclusion criteria:** • between 2 years 6 months and 4 years old • at the start of first intervention • no other teaching interventions • independent diagnosis of autistic disorder or PDD-NOS made by specialist pediatrician according to DSM-IV-TR criteria **Exclusion criteria:** • see above **Age, mean/mos ± SD:** **G1:** 39.0 ± 6.9 **G2:** 41.5 ± 4.0 **G3:** 39.5 ± 6.3 **G4:** 40.2 ± 6.3 **Mental age, mean/yrs (range):** NR **Sex:** **M, n:** **G1:** 13 **G2:** 18 **G3:** 16 **G4:** 12 F, n: **G1:** 1 **G2:** 3	GARS Autism Quotient, mean ± SD **G1:** 91.1 ± 14.4 **G2:** 97.1 ± 9.7 **G3:** 88.9 ± 24.4 **G4:** 99.0 ± 9.7 Psycho-Educational Profile (PEP-R) overall score, mean ± SD **G1:** 55.1 ± 17.3 **G2:** 52.2 ± 17.7 **G3:** 54.0 ± 15.4 **G4:** 51.7 ± 14.5 BAS Cognitive Ability mean ± SD **G1:** 56.1 ± 18.6 **G2:** 57.1 ± 11.8 **G3:** 52.7 ± 10.4 **G4:** 51.5 ± 8.6 VABS composite mean ± SD **G1:** 58.4 ± 10.6 **G2:** 53.3 ± 4.2 **G3:** 56.6 ± 7.0 **G4:** 54.0 ± 4.5	VABS composite change score mean ± SD **G1:** 11.9 ± 7.7 **G2:** 6.8 ± 15.7 **G3:** 2.5 ± 6.1 **G4:** 2.7 ± 8.7 **Adaptive behavior:** VABS change score mean ± SD **G1:** 2.1 ± 4.9 **G2:** 3.8 ± 5.9 **G3:** 0.2 ± 4.9 **G4:** 0.8 ± 5.1 **Educational/ cognitive/ academic attainment:** PEP-R change score mean ± SD **G1:** 14.5 ± 16.0 **G2:** 10.4 ± 28.5 **G3:** 0.6 ± 11.1 **G4:** 3.2 ± 16.4 BAS change score mean ± SD **G1:** 18.8 ± 13.6 **G2:** 6.6 ± 18.0 **G3:** 7.3 ± 8.2 **G4:** 4.2 ± 7.3 **Harms:** NR **Modifiers** Autism severity- for special nursery, portage

	a written manual. Local authority: Home based program for pre-school children. Begins with intensive 5 day training class for parents. Home based supervision and support sessions delivered by educational psychologist up to 4 sessions/wk. These are 1:1 teaching sessions based on discrete trials and reinforcement, conducted by trained teaching assistants. **Assessments:** Gilliam Autism Rating Scale (GARS), Psycho-Educational Profile (PEP-R), British Abilities Scale (BAS II), Vineland Adaptive Behavior Scale (VABS) Conducted by experienced educational psychologist, blinded to group assignment, who completed PEP-R and BAS; assisted parents in completing GARS and VABS. Post intervention measures taken by same person at nine months after initial assessment. **Groups:** **G1:** ABA	**G3:** 2 **G4:** 1 **Race/ethnicity, n (%):** NR **SES:** NR **Diagnostic approach:** In Study/Referral Diagnostic tool/method: DSM-IV-TR **Diagnostic category, n (%):** NR **Other characteristics**, n (%)**:** Intervention hours mean (range) **G1:** 30.4 (20-40) **G2:** 12.7 (3-23) **G3:** 8.5 (2-15) **G4:** 12.6 (11-22) 1:1 Intervention hours mean **G1:** 28.3 **G2:** 3.1 **G3:** 6.5 **G4:** 12.2 (2.5) Group Intervention hours mean **G1:** 2.1 **G2:** 9.6 **G3:** 2.0 **G4:** 0.5 (0.9) Tutors (family tutors) mean number	and local authority (G2, G3, G4) gains made by children inversely related to autism severity and directly related to time-input. The converse was true for ABA.

	G2: Special Nursery **G3:** Portage **G4:** Local authority **Provider:** See above **Treatment manual followed:** ABA and Potage-yes **Defined protocol followed:** NR **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** Yes – “Receiving no other teaching interventions” **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 14 **G2:** 21 **G3:** 18 **G4:** 13 **N at follow-up:** **G1:** 14 **G2:** 21 **G3:** 18 **G4:** 13	**G1:** 4.4 (1.0) **G2:** 4.0 (1.0) **G3:** 4.0 (2.0) **G4:** 3.1 (1.)

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Rogers et al. 2012[53, 54] **Country:** US **Intervention setting:** University clinics for parent training **Enrollment period:** NR **Funding:** Autism speaks grants, NIMH, NICHD **Design:** RCT	**Intervention:** Parent delivery - Early Start Denver Model (P-ESDM**)** 12-week, low-intensity (1-hour/wk of therapist contact), intervention for toddlers at risk for ASD Treatment duration (hours), mean (SD): P-ESDM: 1.48 (1.94) Community treatment as usual: 3.68 (3.91) **Assessments:** Parent acquisition of ESDM intervention skills, developmental gains and core autism symptoms at baseline and 12 weeks later, immediately after the end of parent coaching sessions. Developmental Measures: Mullens Scales of Early Learning (MSEL), MacArthur-Bates Communicative Development Inventory: Words and Gestures (MCDI), VABS-II. Child Moderating variables: Imitation and Orienting to Social, Nonsocial, and Joint Attention Stimuli. Parent measures: General Family	**Inclusion criteria:** • Met risk criteria for ASD on two screeners (Early Screening of Autistic Traits Questionnaire, Infant Toddler Checklist, Modified Checklist for Autism in Toddlers) • Met criteria for ASD in a clinical assessment • Ambulatory (crawling or walking), • Had developmental quotients (DQ) of 35 or higher, • Had English as one language spoken daily in the home **Exclusion criteria:** • Parental self-reported significant mental illness or substance abuse, • Child significant medical conditions including cerebral palsy, gestational age of less than 35 weeks, genetic disorders related to developmental disabilities, • DQ below 35, • Current or previous	**Mean ± SD**: Modified ADOS social affect **G1:**29.45 ± 9.16 **G2:**34.14 ± 8.69 ADOS–Restrictive and Repetitive **G1:** 3.92 ± 2.01 **G2:**4.31 ± 1.92 Mullen DQ **G1:**64.88 ± 17.22 **G2:**63.08 ± 15.93 Mullen Verbal DQ **G1:** 47.78 ± 22.19 **G2:** 44.45 ± 20.37 Mullen Nonverbal DQ **G1:** 80.96 ± 16.68 **G2:** 80.73 ± 15.51 MCDI Part I: Phrases Understood **G1:** 8.22 ± 7.02 **G2**: 9.38 ± 7.95 MCDI Part I: Vocabulary Comprehension **G1:** 64.53 ± 65.73 **G2:** 70.31 ± 78.34 MCDI Part I: Vocabulary Production **G1:** 12.24 ± 35.6 **G2:** 12.44 ± 39.72	**Mean ± SD**: Modified ADOS social affect **G1:** 26.61 ± 10.14 **G2:** 27.33 ± 10.62 ADOS–Restrictive and Repetitive **G1:** 3.96 ± 1.86 **G2:** 3.82 ± 2.04 Mullen DQ **G1:** 69.82 ± 17.9 **G2:** 67.92 ± 17.93 Mullen Verbal DQ **G1:** 56.65 ± 23.65 **G2:** 54.35 ± 21.94 Mullen Nonverbal DQ **G1:** 81.98 ± 14.82 **G2:** 80.57 ± 18.45 MCDI Part I: Phrases Understood **G1:** 12.73 ± 9.11 **G2:** 14.77 ± 8.14 MCDI Part I: Vocabulary Comprehension **G1:** 106.51 ± 96.81 **G2:** 125.72 ± 106.39 MCDI Part I: Vocabulary Production **G1:** 42.27 ± 61.99 **G2:** 38.87 ± 73.71

Demographic Data, Symptom Checklist-90-R (SCL-90-R), ESDM Parent Fidelity Tool, Child Intervention Hours **Groups:** **G1:** Parent-delivered ESDM **G2:** Community interventions **Provider:** Therapists provided parent training **Treatment manual followed:** Yes **Defined protocol followed:** yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 49 **G2:** 49 **N at follow-up:** **G1:** 49 **G2:** 49	enrollment in intensive 1:1 autism intervention of more than 10 hours per week. **Age, mean ± SD/months (range): 14 to 24 months** **G1:** 21.02 ± 3.51 **G2**: 20.94 ± 3.42 **Mental age, mean/yrs (range):** NR **Sex**, n (%)**:** Male **G1:** 37 (75.5) **G2:** 39 (62.5) **Race/ethnicity, n (%):** White **G1:** 34 (69.4) **G2:** 37 (75.5) **SES, n (%):** Maternal education Less than high school **G1:** 6 (12.8) **G2:** 13 (27.1) Some college **G1:** 10 (21.3) **G2:** 8 (16.7) College **G1:** 17 (36.2) **G2:** 21 (43.8) Some graduate school or graduate school **G1:** 14 (29.8) **G2:** 6 (12.5)	MCDI Part II: Total Gestures **G1:**19.89 ± 10.12 **G2:** 20.33 ± 11.15 VAB II: Communication **G1:**67.66 ± 13.19 **G2:**67.29 ± 11.05 VAB II: Daily Living Skills **G1:** 83.07 ± 12.4 **G2:** 83.21 ± 10.6 VAB II: Socialization **G1:** 76.68 ± 8.74 **G2:** 77.95 ± 8.01 VAB II: Adaptive Behavior Composite **G1:** 76.76 ± 10.3 **G2:** 78.22 ± 8.88 imitative Sequences **G1:** 3.78 ± 3.12 **G2:** 2.53 ± 2.6 Mean Social Orient l **G1:** 0.47± 0.33 **G2:** 0.41± 0.29 Mean Nonsocial Orient **G1:** 0.65 ± 0.3 **G2:** 0.62 ± 0.35 Mean Orient to Joint Attention **G1:** 0.35 ± 0.35 **G2:** 0.28 ± 0.33	MCDI Part II: Total Gestures **G1:** 28.02 ± 12.62 **G2:** 29.79 ± 13.51 VAB II: Communication **G1:** 72.55 ± 12.06 **G2:** 74.29 ± 14.55 VAB II: Daily Living Skills **G1:** 82.25 ± 13.82 **G2:** 84.04 ± 13.5 VAB II: Socialization **G1:** 77.32 ± 9.19 **G2:** 78.67 ± 10.78 VAB II: Adaptive Behavior Composite **G1:** 77.43 ± 9.59 **G2**: 80.33 ± 11.34 Imitative Sequences **G1:** 4.58 ± 3.45 **G2:** 3.76 ± 3.44 Mean Social Orient l **G1:** 0.47± 0.28 **G2:** 0.43± 0.35 Mean Nonsocial Orient **G1:** 0.74± 0.28 **G2:** 0.6 ± 0.37 Mean Orient to Joint Attention **G1:** 0.34± 0.29 **G2:** 0.34± 0.34 **Harms:** NR

	Household income: <50K **G1:** 10 (22.2) **G2:** 15 (32.6) 50K–75K **G1:** 5 (11.1) **G2:** 9 (19.6) 75K–100K **G1:** 15 (33.3) **G2:** 12 (26.1) >100K **G1:** 15 (33.3) **G2:** 10 (21.7) **Diagnostic approach:** In Study Diagnostic tool/method: ADOS-T **Diagnostic category, n (%):** ASD: 100% **Other characteristics, n (%):** NR	**Modifiers:** younger age and more intervention hours positively affect developmental rates (p=0.002), and related to the degree of improvement in children's behavior for most variables

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Strauss et al. 2012[55] **Country:** Italy **Intervention setting:** clinic and home **Enrollment period:** NR **Funding:** NR **Design:** Prospective Cohort Note see related study, Fava 2011[56]	**Intervention:** EIBI – cross-setting, staff and parent mediated. For 12 months, alternated between one week of 25 hours of therapist-led center-based intervention and 3 weeks of an average of 14 hrs/week parent-led home intervention. Comparison (eclectic): parents not actively seeking parental involvement; approximately 12 hours per week of in-home developmental intervention and cognitive behavioral treatment without active parental inclusion in therapy sessions. ** Group assignments not random. Parents were able to choose which group their children were assigned to. **Assessments:** ADOS, Griffith Mental Developmental Scales for ages 2-8 (GMDS-ER 2-8), VABS, MacArthur	**Inclusion criteria:** • diagnosis of autism or PDD-NOS • absence of major medical issues other than autism or mental retardation • completed first 6 months of treatment progress • re-evaluated by child psychiatrist after 6 mos. **Exclusion criteria:** • see above Age, mean/mos ± SD (range): **G1:** 55.67 ±17.63 (26-81) **G2:** 41.94 ± 13.07 (27-69) **Mental age, mean/yrs (range):** NR **Sex:** M, n (%): **G1:** 22 (92) **G2:** 19 (95) F, n (%): **G1:** 2 (8) **G2:** 1 (5) **Race/ethnicity, n (%):** NR	Autism severity, mean ± SD Social interaction **G1:** 10.54 ±2.34 **G2:** 9.63 ± 3.24 Communication **G1:** 6.04 ±1.88 **G2:** 4.94 ± 2.23 ADOS total **G1:** 15.96 ±4.33 **G2:** 14.56 ± 5.05 GMDS-ER GQ **G1:** 55.65 ±20.06 **G2:** 74.29 ± 29.37 Early language skills CDI Comprehension **G1:** 53.83 ±28.81 **G2:** 47.17 ± 27.80 CDI production **G1:** 35.29 ±35.97 **G2:** 19.17 ± 28.12 VABS standard scores Communication **G1:** 71.00 ±39.24 **G2:** 60.78 ± 30.42 Daily living **G1:** 78.43 ±33.39 **G2:** 56.44 ± 23.81 Socialization	Outcomes at 6 months post-treatment initiation: Autism severity, mean ± SD Social interaction **G1:** 8.83 ±2.70 **G2:** 9.00± 2.97 Communication **G1:** 4.38 ±1.34 **G2:** 4.56 ± 1.97 ADOS total **G1:** 13.21 ±3.83 **G2:** 13.56 ± 4.72 **Communication/ language:** Early language skills CDI Comprehension **G1:** 70.33 ±27.04 **G2:** 61.33 ± 32.37 CDI production **G1:** 51.81 ±35.23 **G2:** 33.17 ± 42.27 **Adaptive behavior:** VABS standard scores Communication **G1:** 91.43 ±40.44 **G2:** 83.56 ± 41.32 Daily living **G1:** 100.26 ±35.60 **G2:** 88.33 ± 37.29

Communication Developmental Inventories (CDI), video coded challenging behaviors (including amount/difficulty of behavior targets), Parental Stress Index-Short Form (PSI-SF) **Groups:** **G1:** EIBI **G2:** eclectic **Provider:** Eclectic: In-home therapists with monthly or no supervision EIBI: Program director led parent trainings; staff therapists provided child treatment in centers **Treatment manual followed:** NR **Defined protocol followed:** NR **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:**	**SES:** NR **Diagnostic approach:** Confirmed In Study Diagnostic tool/method: DSM and ADI-R **Diagnostic category, n (%):** NR	**G1:** 61.96 ±21.31 **G2:** 56.88 ± 19.21 Motor **G1:** 105.78 ±22.38 **G2:** 92.00 ± 19.97 ABC **G1:** 79.29 ±22.84 **G2:** 66.92 ± 19.25	Socialization **G1:** 67.78 ±19.93 **G2:** 70.50 ± 24.04 Motor **G1:** 112.87 ±13.30 **G2:** 106.59 ± 21.63 ABC **G1:** 93.09 ±23.61 **G2:** 84.88 ± 29.03 **Educational/ cognitive/ academic attainment:** GMDS-ER GQ **G1:** 68.75 ±19.58 **G2:** 76.00 ± 26.08 **Harms:** NR **Modifiers** EIBI group: Older children achieved better adaptive behavior outcomes; younger children made more gains in early language comprehension and production. Children who gained more language comprehension had higher adaptive behavior scores pre-treatment. Pre-treatment language comprehension predicted post-treatment language production. Eclectic group: Higher pre-treatment mental

	G1: 24 **G2:** 20 **N at follow-up:** **G1:** NR **G2:** NR			development state and early language skills predicted better outcome on adaptive behaviors. Initial higher adaptive behaviors predicted better post-treatment early language comprehension. In both groups, the predictive power of parental stress on outcome autism severity was modified by perception of difficult child, with higher perceptions of difficulty associated with lower decreases in autism severity. In both groups, child outcomes on early language skills, mental developmental state and adaptive behaviors are significantly influenced by parental stress, child ability to respond correctly to prompts, number and difficulty of treatment targets, and child problem behaviors in sessions.

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Fava et al. 2011[56] **Country: Italy** **Intervention setting:** Treatment center and home **Enrollment period:** NR **Funding:** Foundation Vodafone Italy; Anima, Foundation BNL, Federalalberghi, Insurance Consulting Group, Azienda Romana Mercat, Hotel Hilton, Sky, Promusic, Ms. Adelaide Mazzeo, Mr. Mauro Paissan **Design:** Retrospective cohort Note: See related study Strauss 2011[55]	**Intervention:** **G1:** Rotated between 3 weeks of center-based EIBI and parent training (approx. 26 hours per week) followed by 3 weeks of parent-mediated home treatment (approx. 12 hours/week) and a 1-week follow-up in a clinic setting for 1 year **G2:** Eclectic mix of in-home developmental and cognitive behavioral treatment (approx 12 hours/week) **Assessments:** Independent professionals/raters: Autism Diagnostic Observation Schedule; Griffith Mental Development Scales; MacArthur Communication Developmental Inventories; Video ratings of challenging behaviors Parent reports: Vineland Adaptive Behavior Scales; Child Behavior Checklist 1.5-5;; Parenting Stress	**Inclusion criteria:** • Diagnosis of autism or PDD-NOS • Absence of major medical issues other than ASD or mental retardation • Completed 6 month evaluation **Exclusion criteria:** NR **Age, mean/months ± SD:** **G1:** 52.0 ± 19.5 **G2:** 43.7 ± 26.9 **Mental age, mean/yrs (range):** GMDS-ER GQ **G1:** 62.1 (38-103) **G2:** 69.8 (44-87) **Sex, n (%):** **G1 :** M: 10 (83) F: 2 (17) **G2:** M: 9 (90) F: 1 (10) **Race/ethnicity, n (%):** NR **SES:** NR **Diagnostic approach:**	**Overall ratings:** **Global Rating of Severity, mean ± SD:** ADOS total: **G1**: 15.6 ± 4.0 **G2**: 12.8 ± 5.0 **Social skills, mean ± SD:** ADOS social interaction: **G1**: 10.0 ± 2.9 **G2**: 8.6 ± 2.7 VABS socialization: **G1**: 69.9 ± 24.5 **G2**: 44.9 ± 14.2 **Communication/ language, mean ± SD:** ADOS communication: **G1**: 5.8 ± 2.1 **G2**: 4.2 ± 2.7 CDI comprehension: **G1**: 48.6 ± 32.5 **G2**: 84.5 ± 4.9 CDI production: **G1**: 33.7 ± 38.6 **G2**: 29.0 ± 7.1 VABS communication: **G1**: 77.3 ± 45.2 **G2**: 49.3 ± 30.6 **Problem behavior, mean ± SD:** Parent session:	**Note: all p-values represent within-group changes vs. baseline over a six month time period. "Not all measures were available for all included children," but specific ns are not provided. **Overall ratings:** **Global Rating of Severity, mean ± SD:** ADOS total: **G1**: 12.3 ± 3.2 p=0.001 **G2**: 12.0 ± 4.5 p=NS **Social skills, mean ± SD:** ADOS social interaction: **G1**: 8.3 ± 2.1 p=0.004 **G2**: 8.1 ± 2.6 p=NS VABS socialization: **G1**: 70.8 ± 24.7 p=NS **G2**: 57.0 ± 15.5 p<0.001 **Communication/ language, mean ± SD:** ADOS communication: **G1**: 4.0 ± 1.3 p=0.011

Inventory – Short Form Assessments made at baseline and at 6 months **Groups:** **G1**: EIBI **G2**: Eclectic Group assignment based on parental preference **Provider:** Staff and parents **Treatment manual followed:** No **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1**: 12 **G2**: 10 **N at follow-up:** **G1**: 12 **G2**: 10	Referral ("diagnosis …made independently of the study by external neuro-psychiatrists and child psychologists…") Diagnostic tool/method: DSM and ADI-R **Diagnostic category, n (%):** Autism: NR PDD-NOS: NR Aspergers: NR **Other characteristics**, n (%)**:** NR	Aggression: **G1:** 11.7 ± 6.6 **G2:** NR Stereotypes: **G1:** 17.0 ± 5.9 **G2:** NR Dysfunctional: **G1:** 14.5 ± 5.1 **G2:** NR Staff session: Aggression: **G1:** 6.5 ± 4.4 **G2:** NR Stereotypes **G1:** 12.3 ± 5.2 **G2:** NR Dysfunctional **G1:** 10.1 ± 0.8 **G2:** NR **Adaptive behavior, mean ± SD:** VABS ABC: **G1**: 63.3 ± 25.9 **G2**: 44.3 ± 16.4 VABS daily living: **G1**: 74.5 ± 36.3 **G2**: 47.4 ± 16.3 **Commonly occurring co-morbidities, mean ± SD:** CBCL affective problems **G1**: 58.0 ± 7.2 **G2**: 56.8 ± 7.1 CBCL anxiety problems: **G1**: 56.1 ± 6.8 **G2**: 59.6 ± 14.6	**G2**: 3.9 ± 2.2 p=NS CDI comprehension: **G1**: 59.4 ± 32.5 p=0.001 **G2**: 72.6 ± 41.7 p=NS CDI production: **G1**: 48.0 ± 39.7 p=0.049 **G2**: 52.5 ± 28.6 p=NS VABS communication: **G1**: 89.3 ± 48.4 p=0.010 **G2**: 66.0 ± 38.2 p<0.001 **Problem behavior, mean ± SD:** Parent session: Aggression: **G1:** 4.6 ± 3.5 p<0.0001 **G2:** NR Stereotypes: **G1:** 7.8 ± 2.9 p<0.0001 **G2:** NR Dysfunctional: **G1:** 5.9 ± 1.7 p<0.0001 **G2:** NR Staff session: Aggression: **G1:** 3.0 ± 2.2

	CBCL pervasive developmental: **G1**: 69.0 ± 8.9 **G2**: 67.7 ± 9.8 CBCL attention deficit/ hyperactivity: **G1**: 57.1 ± 5.3 **G2**: 57.2 ± 5.8 CBCL oppositional defiant: **G1**: 54.1 ± 5.5 **G2**: 55.3 ± 6.9 **Motor skills, mean ± SD:** VABS motor: **G1**: 99.7 ± 17.9 **G2**: 84.9 ± 14.2 **Educational/ cognitive/ academic attainment:** GMDS-ER GQ: **G1**: 62.1 ± 21.5 **G2**: 69.8 ± 16.6 **Parental quality of life, mean ± SD:** PSI total: **G1**: 92.0 ± 13.1 **G2**: 88.7 ± 2.3 PSI, parental distress **G1**: 29.4 ± 10.4 **G2**: 26.1 ± 10.9 PSI, parent-child difficult interaction: **G1**: 25.9 ± 5.9 **G2**: 26.1 ± 5.9 PSI, difficult child: **G1**: 37.3 ± 8.2	P=0.0003 **G2:** NR Stereotypes **G1:** 6.0 ± 2.7 p<0.0001 **G2:** NR Dysfunctional **G1:** 4.2 ± 1.6 p<0.0001 **G2:** NR **Adaptive behavior, mean ± SD:** VABS ABC: **G1**: 77.4 ± 34.4 p=0.010 **G2**: 65.0 ± 23.0 p=0.006 VABS daily living: **G1**: 101.5 ± 40.8 p<0.001 **G2**: 67.8 ± 17.8 p<0.001 **Commonly occurring co-morbidities, mean ± SD:** CBCL affective problems **G1**: 55.3 ± 6.3 p=NS **G2**: 59.9 ± 8.7 p=NS CBCL anxiety problems: **G1**: 54.6 ± 5.6 p=NS **G2**: 60.2 ± 11.7 p=NS

		G2: 39.3 ± 4.5	
			CBCL pervasive developmental: **G1**: 66.6 ± 7.6 p=NS **G2**: 68.9 ± 6.7 p=NS CBCL attention deficit/ hyperactivity: **G1**: 53.8 ± 3.6 p=0.030 **G2**: 56.8 ± 8.1 p=NS CBCL oppositional defiant: **G1**: 53.1 ± 3.6 p=NS **G2**: 53.8 ± 5.3 p=NS **Motor skills, mean ± SD:** VABS motor: **G1**: 109.9 ± 14.6 p=0.007 **G2**: 102.8 ± 11.2 p=0.002 **Educational/ cognitive/ academic attainment:** GMDS-ER GQ: **G1**: 76.4 ± 21.6 p=0.005 **G2**: 95.5 ± 9.7 p=NS **Parental quality of life, mean ± SD:** PSI total: **G1**: 94.3 ± 9.7

		p=NS **G2**: 81.0 ± 12.1 p=0.023 PSI, parental distress: **G1**: 31.1 ± 9.5 p=NS **G2**: 28.3 ± 19.2 p=NS PSI, parent-child difficult interaction: **G1**: 25.8 ± 5.9 p=NS **G2**: 40.1 ± 25.5 p=NS PSI, difficult child **G1**: 37.5 ± 10.8 p=NS **G2**: 49.6 ± 28.8 p=NS **Harms:** NR **Modifiers:** NR

Comments: Paper only provided significance testing results for within-group differences; no between-group differences analyzed or reported

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Thomeer et al. 2012[57] **Country:** US **Intervention setting:** Clinic **Enrollment period:** NR **Funding:** John R. Oishei Foundation **Design:** RCT	**Intervention:** Skillstreaming psychosocial intervention 5 days per week, five 70 minute treatment cycles per day for 5 weeks. Treatment groups were divided by age (7-8 year, 9-10 year, and 11-12 year olds) with 6 children and 3 staff per group. **Assessments:** Adapted Skillstreaming Checklist, Social Responsiveness Scale, BASC-2-PRS and BASC-2 Teacher Rating Scales, Skillstreaming Knowledge Assessment, Diagnostic Analysis of Nonverbal Accuracy-2, Parent, Child and Staff Satisfaction Surveys, Comprehensive Assessment of Spoken Language, WISC-IV, ADI-R **Groups:** **G1:** intervention **G2:** wait-list control **Provider:** Staff were undergraduate and graduate students. **Treatment manual**	**Inclusion criteria:** • prior clinical diagnosis of HFASD • Wechsler Intelligence Scale test for Children-4th edition short form IQ > 70 (and verbal comprehension index or perceptual reasoning index score ≥ 80) • Comprehensive Assessment of Spoken Language short form expressive or receptive language >80 • score meeting ASD criteria on ADI-R **Exclusion criteria:** • IQ a/o language score below minimum • elevated physical aggression **Age, mean/yrs (range):** **G1:** 9.24 ± 1.64 **G2:** 9.39 ± 1.91 **Mental age, mean/yrs (range):** NR **Sex:** M, n (%) **G1:** 14 (82.4)	ASC Total Score, mean ± SD **G1:** 107.29 ± 19.85 **G2:** 102.82 ± 17.65 SRS Total Score **G1:** 83.24 ± 17.27 **G2:** 83.06 ± 12.61 BASC-2 PRS withdrawal **G1:** 72.65 ± 17.34 **G2:** 71.53 ± 16.07 BASC-2 PRS Social Skills **G1:** 36.53 ± 9.00 **G2:** 33.94 ± 4.96 SKA Total **G1:** 33.74 ± 13.00 **G2:** 36.11 ± 14.28 DANVA-2 Child Faces **G1:** 93.79 ± 12.59 **G2:** 94.67 ± 18.76 CASL Idioms **G1:** 9.94 ± 6.02 **G2:** 11.65 ± 7.66	ASC Total Score, mean ± SD **G1:** 118.65 ± 12.82 **G2:** 100.59 ± 21.63 SRS Total Score **G1:** 75.24 ± 13.54 **G2:** 84.29 ± 13.84 BASC-2 PRS **G1:** 69.76 ± 13.86 **G2:** 74.53 ± 14.50 BASC-2 PRS Social Skills **G1:** 40.94 ± 6.04 **G2:** 34.94 ± 7.16 SKA Total **G1:** 50.47 ± 17.58 **G2:** 34.11 ± 13.22 DANVA-2 Child Faces **G1:** 97.94 ± 12.36 **G2:** 94.22 ± 20.75 CASL Idioms **G1:** 12.65 ± 6.22 **G2:** 11.94 ± 7.79 **Harms:** NR **Modifiers:** NR

followed: Yes	**G2:** 16 (88.9)
Defined protocol followed: Yes	F, n (%) **G1:** 3 (17.6) **G2:** 2 (11.1)
Measure of treatment fidelity reported: Yes	**Race/ethnicity, n (%):**
Co-interventions held stable during treatment: Yes	White **G1:** 14 (82.4) **G2:** 14 (77.8)
Concomitant therapies, n (%): NR	African American **G1:** 1 (5.9) **G2:** 1 (5.6)
N at enrollment: **G1:** 17 **G2:** 18 **N at follow-up:** **G1:** NR **G2:** NR	Hispanic **G1:** 1 (5.9) **G2:** 0
	Asian American **G1:** 0 **G2:** 1 (5.6)
	Other **G1:** 1 (5.9) **G2:** 2 (11.1)
	SES: Parent education, years mean : **G1:** 15.32 ± 2.42 **G2:** 14.69 ± 1.21
	Diagnostic approach: In Study/Referral
	Diagnostic category, n (%): HFA **G1:** 1 (5.9) **G2:** 0

PDD-NOS
G1: 3 (17.6)
G2: 6 (33.3)

Asperger syndrome
G1: 13 (76.5)
G2: 12 (66.7)

Other characteristics, n (%)**:**
WISC-IV Short form IQ, mean ± SD:
G1: 104.26 ± 14.13
G2: 103.42 ± 13.26

CASL Expressive Language
G1: 101.29 ± 13.90
G2: 99.17 ± 13.54

CASL Receptive Language
G1: 102.88 ± 15.59
G2: 109.44 ± 13.71

ADI-R Social
G1: 19.59 ± 5.50
G2: 16.22 ± 5.66

ADI-R Communication
G1: 14.00 ± 5.61
G2: 13.72 ± 4.87

ADI-R Repetitive Behavior
G1: 6.65 ± 2.06
G2: 6.11 ± 2.17

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Venker et al. 2012[58] **Country:** US **Intervention setting:** Research clinic **Enrollment period:** NR **Funding:** NR **Design:** RCT	**Intervention:** More than Words (MTW) a parent training intervention that teaches parents how to better understand children's communication and adapt their interactions to support language learning Five parent education sessions (two hours each) and two individual coaching sessions (45 min each) plus a small group component on twice weekly basis led by graduate student **Assessments:** Preschool Language Scale, Mullen Scales of Early Learning, Infant and Toddler forms of MacArthur Communicative Development Inventory (CDI) Pre-treatment and post-treatment (approximately 10 weeks) **Groups:** **G1:** MTW immediate treatment **G2:** delayed treatment **Provider:**	**Inclusion criteria:** • NR (Families recruited from an ongoing longitudinal study of language development in autism) **Exclusion criteria:** NR **Age, mean/mos ± SD (range):** **G1+G2:** 41.14 ± 10.40 (28-68) **Mental age, mean/yrs (range):** NR **Sex:** NR Race/ethnicity, n (%): NR **SES:** NR **Diagnostic approach:** Referral Diagnostic tool/method: Confirmed in study with ADOS or ADI-R **Diagnostic category, n (%):** ASD (100) **Other characteristics, mean ± SD (range):** ADOS severity score **G1+G2**: 8 ± 2.13 (4-10)	Parent Variables, mean ± SD (range): Follow-in commenting **G1:** 53.43 ± 24.35 (14-75) **G2:** 73.86 ± 25.91 (42-125) Linguistic mapping and expansions **G1:** 0.14 ± 0.38 (0-1) **G2:** 0.71 ± 0.76 (0-2) Prompts **G1:** 1.14 ± 1.46 (0-4) **G2:** 3.14 ± 3.29 (0-8) Redirects **G1:** 14.00 ± 8.58 (2-28) **G2:** 12.29 ± 10.00 (3-32) Child Variables, mean ± SD (range): Prompted communication acts **G1:** 0.29 ± 0.49 (0-1) **G2:** 2.00 ± 2.24 (0-6) Spontaneous verbal communication acts **G1:** 1.29 ± 3.40 (0-9) **G2:** 11.71 ± 13.70 (0-34) Spontaneous nonverbal communication acts **G1:** 0.57 ± 0.79 (0-2) **G2:** 0.57 ± 0.53 (0-1)	Parent Variables, mean ± SD (range): Follow-in commenting **G1:** 74.57 ± 33.51 (31-111) **G2:** 73.00 ± 19.04 (47-100) Linguistic mapping and expansions **G1:** 7.57 ± 7.37 (0-21) **G2:** 1.57 ± 1.81 (0-5) Prompts **G1:** 13.43 ± 11.91 (0-32) **G2:** 1.43 ± 2.30 (0-6) Redirects **G1:** 4.29 ± 3.35 (1-10) **G2:** 14.29 ± 15.39 (0-45) Child Variables, mean ± SD (range): Prompted communication acts **G1:** 9.71 ± 14.08 (0-40) **G2:** 1.86 ± 2.67 (0-7) Spontaneous verbal communication acts **G1:** 4.71 ± 6.13 (0-15) **G2:** 12.57 ± 19.81 (0-54) Spontaneous nonverbal communication acts **G1:** 2.43 ± 3.15 (0-9) **G2:** 2.14 ± 2.73 (0-7)

Hanen certified speech language pathologist **Treatment manual followed:** NR **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 7 **G2:** 7 **N at follow-up:** **G1: 7** **G2: 7**	Preschool language scale-4 Auditory comprehension age equivalent months **G1+G2**: 14.79 ± 7.04 (6-32) Preschool language scale-4 Expressive communication age equivalent months **G1+G2**: 20.21 ± 7.47 (12-41) Communicative Development Inventory (CDI) words understood (infant form**)** **G1+G2**: 181 ± 143.05 (20-396) CDI Words produced infant form **G1+G2**: 108.23 ± 151.00 (0-384) CDI words produced toddler form **G1+G2**: 148.38 ± 223.87 (0-657) Mullen Visual reception age equivalent **G1+G2**: 28.79 ± 13.80 (12-60)	**Proportion of parents and children who improved, n** Follow-in commenting **G1:** 7 **G2:** 4 p=0.037 Linguistic mapping and expansions **G1:** 6 **G2:** 3 p=0.070 Prompts **G1:** 6 **G2:** 1 p=0.007 Redirects **G1: 6** **G2:** 3 p=0.070 Prompted communication acts **G1:** 5 **G2:** 1 p=0.022 Spontaneous verbal communication acts **G1:** 5 **G2:** 3 p=0.172 Spontaneous nonverbal communication acts **G1:** 5 **G2: 3** p=0.172

	Group comparisons of parents and child variables, median gain score Follow-in commenting **G1:** 17 **G2:** 9 p=0.029 Linguistic mapping and expansions **G1:** 6 **G2:** 0 p=0.025 Prompts **G1:** 12 **G2:** -1 p=0.002 Redirects **G1:** -7 **G2:** 1 p=0.004 Prompted communication acts **G1:** 4 **G2: -**1 p=0.007 Spontaneous verbal communication acts **G1:** 1 **G2:** 0 p=0.196 Spontaneous nonverbal communication acts **G1:** 1

	G2: 0 p=0.320 **Harms:** NR **Modifiers:** NR

Comments: all reported p-values from one-tailed test

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Williams et al. 2012[59] **Country:** Australia **Intervention setting:** home **Enrollment period:** October 2009 to January 2011 **Funding:** Financial Marets Foundation for Children, Australia **Design:** RCT	**Intervention:** *Transporters* DVD has 15 five minute episodes. Watched at home for 15 minutes/day over 4 weeks Control group watched Thomas the Tank DVD-series 5 **Assessments:** WPPSI-III; Socialization Domain of Vineland-II; ADOS; emotion identification and emotion masking tasks; NEPSY-II affect recognition and Theory of Mind (TOM) tasks Baseline, post intervention and three month follow-up. **Groups:** **G1:** intervention DVD **G2:** control DVD **Provider:** Clinician conducted assessments **Treatment manual followed:** NR **Defined protocol followed:** NR **Measure of treatment**	**Inclusion criteria:** • met criteria for diagnosis of autistic disorder based on current assessments including ADOS and case review • age 4-7 at baseline • able to complete WPPSI-III cognitive assessment at baseline or within previous 12 months (cognitively ≥ 30 months) • not previously watched the *Transporters* **Exclusion criteria:** NR **Age, mean/mos ± SD (range):** **G1:** 62.83 ± 11.17 (48.20-84.24 **G2:** 61.93 ± 9.91 (48.10-83.09) **Mental age, mean ± SD (range):** WPPSI FSIQ **G1:** 77.93 ± 13.96 (54-107) **G2:** 74.56 ± 13.59 (42-96) **Sex:** M, %: **G1:** 89.3 **G2:** 85.2	**Identification of emotions, mean ± SD** Total emotions (max score 12) **G1:** 8.12 ± 2.62 **G2:** 7.00 ± 2.32 Happiness (max score 3) **G1:** 2.68 ± 0.56 **G2:** 2.42 ± 0.83 Sadness (max score 3) **G1:** 1.64 ± 1.08 **G2:** 1.17 ± 0.82 Anger (max score 3) **G1:** 1.88 ± 1.09 **G2:** 1.58 ± 1.14 Fear (max score 3) **G1:** 1.92 ± 1.15 **G2:** 1.79 ± 1.06 **Matching of emotions, mean ± SD** Total emotions (max score 16) **G1:** 10.64 ± 4.08 **G2:** 10.63 ± 3.77 Happiness (max score 4) **G1:** 3.21 ± 1.17 **G2:** 3.04 ± 1.22 Sadness (max score 4) **G1:** 2.68 ± 1.31 **G2:** 2.41 ± 1.39	**Time 3 (3 month follow-up)** **Identification of emotions, mean ± SD** Total emotions (max score 12) **G1:** 9.00 ± 2.29 **G2:** 7.36 ± 3.25 Happiness (max score 3) **G1:** 2.88 ± 0.33 **G2:** 2.52 ± 0.96 Sadness (max score 3) **G1:** 1.80 ± 1.08 **G2:** 1.40 ± 1.19 Anger (max score 3) **G1:** 2.12 ± 1.05 **G2:** 1.84 ± 1.07 Fear (max score 3) **G1:** 2.20 ± 0.87 **G2:** 1.64 ± 1.11 **Matching of emotions, mean ± SD** Total emotions (max score 16) **G1:** 11.82 ± 3.66 **G2:** 10.26 ± 4.11 Happiness (max score 4) **G1:** 3.61 ± 0.79 **G2:** 3.30 ± 1.10 Sadness (max score 4)

fidelity reported: Yes parents completed daily diary recording DVD viewing hours **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 29 **G2:** 31 **N at follow-up:** **G1:** 28 **G2:** 27	**Race/ethnicity, n (%):** NR **SES:** NR **Diagnostic approach:** In Study/Referral Diagnostic tool/method: ADOS **Diagnostic category, n (%):** Autism = NR PDD-NOS = NR Aspergers = NR **Other characteristics**, n (%)**:** **ADOS Severity scores, mean ± SD** **G1:** 6.79 ± 1.5 **G2:** 7.56 ± 2.29 WPPSI VIQ, mean ± SD **G1:** 73.61 ± 14.26 (48-93) **G2:** 74.33 ± 14.59 (46-107) WPPSI PIQ, mean ± SD **G1:** 87.89 ± 16.24 (59-122) **G2:** 82.22 ± 15.57 (47-112) DVD hours, mean ± SD **G1:** 11.76 ± 9.16 (3.33-47.12) **G2:** 7.41 ± 3.21 (1.58-14.67) = 0.03	Anger (max score 4) **G1:** 2.00 ± 1.54 **G2:** 2.41 ± 1.34 Fear (max score 4) **G1:** 2.75 ± 1.30 **G2:** 2.74 ± 1.26 **NEPSY-II, mean ± SD** Affect recognition (max score 25) **G1:** 12.33 ± 4.20 **G2:** 12.72 ± 3.53 TOM verbal (max score 15) **G1:** 7.60 ± 3.68 **G2:** 6.28 ± 3.10 TOM contextual (max score 6) **G1:** 3.63 ± 1.67 **G2:** 2.83 ± 1.10 **Mindreading and social skill, mean ± SD** Mindreading situational (max score 6) **G1:** 4.35 ± 1.50 **G2:** 4.55 ± 1.91 Mindreading desire based (max score 6) **G1:** 4.22 ± 1.59 **G2:** 4.00 ± 1.29 **Vineland-II socialization domain**, **mean ± SD** **G1:** 74.22 ± 13.66 **G2:** 71.93 ± 9.94	**G1:** 2.79 ± 1.34 **G2:** 2.48 ± 1.37 Anger (max score 4) **G1:** 2.54 ± 1.23 **G2:** 2.00 ± 1.44 Fear (max score 4) **G1:** 2.89 ± 1.17 **G2:** 2.48 ± 1.25 **NEPSY-II, mean ± SD** Affect recognition (max score 25) **G1:** 16.00 ± 4.66 **G2:** 13.17 ± 3.43 TOM verbal (max score 15) **G1:** 9.67 ± 3.27 **G2:** 6.94 ± 3.40 TOM contextual (max score 6) **G1:** 3.70 ± 1.49 **G2:** 3.80 ± 1.40 **Mindreading and social skill, mean ± SD** Mindreading situational (max score 6) **G1:** 5.05 ± 0.91 **G2:** 4.50 ± 1.61 Mindreading desire based (max score 6) **G1:** 4.32 ± 1.46 **G2:** 4.42 ± 1.54 **Vineland-II socialization domain**,

	SIQ , % < 69 **G1:** 25.0 **G2:** 33.3 70-79 **G1:** 32.1 **G2:** 33.3 ‘> 79 **G1:** 42.9 **G2:** 33.3	**mean ± SD** **G1:** 76.35 ± 13.11 **G2:** 73.52 ± 9.80 **Harms:** NR **Modifiers:** NR **Predictors** Age and VIQ were predictors for outcome measures

Comments: Attrition problems due to challenging behaviors interfering with intervention adherence

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Young et al. 2012[60] **Country:** Australia **Intervention setting:** Home **Enrollment period:** NR **Funding:** NR **Design:** RCT	**Intervention:** *The Transporters* DVD children's animated series designed to enhance emotion recognition and social understanding Control group watched *Thomas the Tank Engine* DVD. Both groups received user guides. Participants were asked to watch at least 3 episodes per day for 3 weeks. Parents kept log books. **Assessments:** Wechsler Scales (WPPSI-III or WISC-IV subtests) to measure non-verbal and general language abilities; Affect Recognition subset of NEPSY-II and the Faces Task; Parent SCQ **Groups:** **G1:** *The Transporters* DVD **G2:** Thomas the Tank DVD **Provider:** Parent/Caregiver **Treatment manual followed:** NR	**Inclusion criteria:** • children between 4 and 8 years old • met DSM-IV criteria for PDD • minimum score of 11 on Social Communication Questionnaire (SCQ) **Exclusion criteria:** NR **Age, mean/yrs (range):** **G1 + G2:** (4-8) **Mental age, mean/yrs (range):** NR **Sex:** NR Race/ethnicity, n (%): NR **SES:** NR **Diagnostic approach:** In Study/Referral Diagnostic tool/method: DSM-IV **Diagnostic category, n (%):** Autism =NR PDD-NOS =NR Aspergers =NR	NEPSY-II affect recognition, mean ± SD: **G1:** 6.15 ± 3.26 **G2:** 6.75 ± 3.62 Faces task, mean ± SD: **G1:** 10.62 ± 3.64 **G2:** 8.58 ± 3.92 Social behavior, mean ± SD Social peer interest **G1:** 3.15 ± 1.21 **G2:** 2.50 ± 0.81 Eye Contact **G1:** 2.92 ± 1.10 **G2:** 2.83 ± 1.03 Gaze Aversion **G1:** 3.00 ± 1.00 **G2:** 3.08 ± 1.24 Stereotyped behavior **G1:** 2.15 ± 1.07 **G2:** 2.58 ± 1.16	**Social skills** NEPSY-II affect recognition, mean ± SD: **G1:** 12.00 ± 3.71 **G2:** 6.42 ± 3.23 Faces task, mean ± SD: **G1:** 14.08 ± 3.59 **G2:** 9.33 ± 4.05 Social behavior, mean ± SD Social peer interest **G1:** 3.31 ± 1.18 **G2:** 2.92 ± 1.10 Eye Contact **G1:** 3.46 ± 0.78 **G2:** 3.42 ± 1.08 Gaze Aversion **G1:** 3.00 ± 1.21 **G2:** 2.85 ± 0.80 Stereotyped behavior **G1:** 2.15 ± 1.07 **G2:** 2.50 ± 1.09 **Harms:** NR **Modifiers:** NR

Defined protocol followed: No **Measure of treatment fidelity reported:** No **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 13 **G2:** 12 **N at follow-up:** **G1:** 13 **G2:** 12	**Other characteristics**, n (%)**:** Autism severity scale, mean ± SD: **G1:** 18.38 ± 5.59 **G2:** 18.08 ± 4.81 Block Design, mean ± SD: **G1:** 11.31 ± 4.17 **G2:** 8.67 ± 4.05 Comprehension, mean ± SD: **G1:** 7.08 ± 5.06 **G2:** 3.67 ± 3.87 Vocabulary, mean ± SD: **G1:** 9.62 ± 4.39 **G2:** 7.83 ± 2.92

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Begeer et al., 2011[61] **Country:** Netherlands **Intervention setting:** Academic center **Enrollment period:** NR **Funding:** NR **Design:** RCT	**Intervention:** Theory of Mind training, including 16 weekly sessions of 1.5 hrs each, with parent involvement in last 15 minutes of each session **Assessments:** standardized child interviews and assessments, parent report **Groups:** **G1:** Theory of Mind intervention **G2:** wait list controls **Provider:** Certified therapists **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** No **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR	**Inclusion criteria:** • clinical diagnosis within the autism spectrum • IQ scores within the normal range (≥ 70) • age 8-13 years old **Exclusion criteria:** • see inclusion criteria **Age, mean/yrs;months ± SD (range):** **G1:** 10;3 ± 1;3 (8;5 – 13;7) **G2:** 10;3 ± 1;1 (8;3 – 12;7) **Mental age, mean ± SD (range):** Full-scale IQ: **G1:** 100.1 ± 15.3 (79 - 133) **G2:** 103.3 ± 12.9 (82 – 126) Verbal IQ: **G1:** 101.3 ± 16.2 (68 – 123) **G2:** 109.1 ± 11.1 (89 – 130) Nonverbal IQ: **G1:** 98.4 ± 16.8 (73 – 132) **G2:** 96.6 ± 17.9 (67 – 125) **Sex:** M, n (%): **G1:** 18 (94.7) **G2:** 15 (88.2)	**Social skills, mean ± SD:** Theory of Mind total score: **G1:** 50.89 ± 5.31 **G2:** 54.00 ± 5.93 Theory of Mind precursors: **G1:** 18.05 ± 1.51 **G2:** 17.94 ± 1.89 Elementary Theory of Mind: **G1:** 25.10 ± 3.30 **G2:** 27.59 ± 3.12 Advanced Theory of Mind scale: **G1:** 7.44 ± 1.00 **G2:** 8.47 ± 1.91 LEAS-C total: **G1:** 32.89 ± 8.64 **G2:** 31.53 ± 5.95 LEAS-C mixed emotions: **G1:** 1.83 ± 1.72 **G2:** 2.94 ± 3.11 LEAS-C complex emotions: **G1:** 1.89 ± 2.87 **G2:** 4.52 ± 4.45 Self-reported empathy: **G1:** 3.95 ± 2.07 **G2:** 4.65 ± 2.18 CSBQ:	**Social skills, mean ± SD:** Theory of Mind total score: **G1:** 58.21 ± 4.00 **G2:** 58.00 ± 5.78 p=0.03 Theory of Mind precursors: **G1:** 19.37 ± 1.38 **G2:** 19.05 ± 1.71 p=NS Elementary Theory of Mind: **G1:** 29.84 ± 2.36 **G2:** 29.24 ± 3.70 p=0.005 Advanced Theory of Mind scale: **G1:** 9.00 ± 2.11 **G2:** 9.71 ± 1.45 p=NS LEAS-C total: **G1:** 37.72 ± 10.73 **G2:** 33.47 ± 6.40 p=NS LEAS-C mixed emotions: **G1:** 4.72 ± 5.40 **G2:** 2.24 ± 3.19 p=0.02 LEAS-C complex

N at enrollment: **G1:** 20 **G2:** 20 **N at follow-up:** **G1:** 19 **G2:** 17	F, n (%): **G1:** 1 (5.3) **G2:** 2 (11.8) **Race/ethnicity, n (%):** NR **SES:** NR **Diagnostic approach:** In Study Diagnostic tool/method: DSM-IV-TR, SRS and/or ASQ **Diagnostic category, n (%):** Autism **G1:** 2 **G2:** 0 PDD-NOS **G1:** 14 **G2:** 10 Aspergers **G1:** 3 **G2:** 7 **Other characteristics**, n (%)**:** Autism quotient score, mean ± SD: **G1:** 125.7 ± 19.4 **G2:** 138.9 ± 19.8 Social responsiveness scale, mean ± SD: **G1:** 74.9 ± 21.6 **G2:** 80.2 ± 22.54	**G1:** 36.67 ± 14.76 **G2:** 42.94 ± 13.77 **Commonly occurring co-morbidities** ADHD: **G1:** 4 **G2:** 3 Learning disorder: **G1:** 1 **G2:** 0	emotions: **G1:** 4.16 ± 4.40 **G2:** 1.71 ± 3.06 p=0.001 Self-reported empathy: **G1:** 4.00 ± 2.62 **G2:** 4.41 ± 2.11 p=NS CSBQ: **G1:** 34.80 ± 17.60 **G2:** 40.00 ± 14.54 p=NS **Harms:** NR **Modifiers** PDD-NOS group performed similar to the overall analysis, including treatment effects on total Theory of Mind score (p<0.05), elementary Theory of Mind tasks (p<0.05), understanding of mixed emotions and complex emotions (both p<0.05). The high-functioning autism/Asperger group only showed improvement on understanding of complex emotions (p<0.01). No effect of ASD diagnostic group on self-reported empathy or parent reported social skills.

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Carter et al. 2011[62] **Country:** US **Intervention setting:** Clinic and home **Enrollment period:** NR **Funding:** Autism Speaks and Marino Autism Research Institute **Design:** RCT conducted at 3 sites	**Intervention:** Hanen's "More than Words" (MTW) over 3.5 months; 8 group sessions with parents only and 3 in-home individualized parent –child sessions Time 2: 5 months (m = 5.3, sd = .47) Time 3: 9 months (m = 9.3, sd = .56) **Assessments:** Screening Tool for Autism in Two year olds (STAT), Mullen Scales of Early Learning (MSEL), Vineland Adaptive Behavior Scales – Second Edition (VABS), Autism Diagnostic Observatoin Schedule (ADOS), Parent Interview Autism-Clinical Version, Early Social Communication Scales, Parent Child Free Play procedure, Parent Interview for Autism – Clinical Version, Developmental Play Assessment, questionnaires assessing parent treatment satisfaction **Groups:**	**Inclusion criteria:** : below **Exclusion criteria:** • child > 24 months • genetic disorder failed to obtain predetermined "at risk" score on STAT and/or did not meet symptom criteria for ASD based on expert clinical impression • Fragile X diagnosis Age, mean/months ± SD (range): **G1:** 21.11 ± 2.71 **G2:** 21.51 ± 2.82 **Mental age, mean/yrs (range):** NR **Sex:** M, 51 (82%) F, 11 (18%) **Race/ethnicity, (%):** White (47.4) Asian /White (5.3) Hispanic or Latino (38.6) Black (3.5) American Indian/Alaskan Native/White (3.5) American Indian/Alaskan Native /Hispanic (1.8)	Mullen Expressive Language Age (mos), mean ± SD **G1:** 8.22 ± 6.01 **G2:** 7.33 ± 3.71 Mullen Receptive Language Age (mos), mean ± SD **G1:** 8.41 ± 5.42 **G2:** 8.17 ± 4.44 Vineland Socialization SS, mean ± SD **G1:** 73.95 ± 6.46 **G2:** 72.42 ± 6.59 Vineland Communication SS, mean ± SD **G1:** 66.61 ± 12.87 **G2:** 63.21 ± 9.13 Parent-Child Free Play (PCFP) proportion of codable intervals with parental responsivity, mean ± SD **G1:** 0.32 ± 0.06 **G2:** 0.29 ± 0.08 ESCS initiating joint attention, mean ± SD **G1:** 5.90 ± 5.41 **G2:** 5.59 ± 6.14 ESCS initiating behavior requests, mean ± SD	**Social skills:** Vineland Socialization SS, mean ± SD **G1:** 71.42 ± 7.07 **G2:** 70.70 ± 6.89 PCFP proportion of codable intervals with parental responsivity, mean ± SD **G1:** 0.34 ± 0.07 **G2:** 0.30 ± 0.10 T1 to T3 residualized gain scores, mean ± SD Effect size (95% CI) **G1:** 0.03 ± 0.08 **G2:** -0.02 ± 0.10 0.50 (-0.18, 1.18) **Communication/ language:** ADOS Social-Communication Total **G1:** 15.56 ± 4.56 **G2:** 13.60 ± 4.89 Mullen Expressive Language Age (mos), mean ± SD **G1:** 16.20 ± 7.23 **G2:** 16.68 ± 7.88 Mullen Receptive Language Age (mos), mean ± SD **G1:** 15.52 ± 6.93

G1: intervention (MTW) **G2:** control ("business as usual") **Provider:** Speech/language pathologist and parent **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** No **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 32 **G2:** 30 **N at follow-up:** **G1:** 29 **G2:** 26	**SES:** Maternal education, (%): High school (16) Some college, an associate's degree or vocational/trade degree (33) College degree (35 Advanced degree (16) Household income, mean (range): **Diagnostic approach:** Referral Diagnostic tool/method: ADOS and DSM-IV-based clinical impressions of a clinical psychologist familiar with ASD in early childhood **Diagnostic category, n (%):** Autism 46/50 (92%) at Time 3 PDD-NOS - NR Aspergers - NR **Other characteristics**, n (%)**:** NR	**G1:** 11.87 ± 10.09 **G2:** 9.00 ± 6.22 PCFP weighted frequency of intentional communication, mean ± SD **G1:** 5.55 ± 6.29 **G2:** 8.20 ± 12.63 PIA-CV nonverbal communication, mean ± SD **G1:** 2.30 ± 0.64 **G2:** 2.28 ± 0.73	**G2:** 17.48 ± 8.33 Vineland Communication SS, mean ± SD **G1:** 76.14 ± 13.85 **G2:** 76.43 ± 14.05 ESCS initiating joint attention, mean ± SD **G1:** 10.33 ± 9.82 **G2:** 8.68 ± 9.26 T1 to T3 residualized gain scores, mean ± SD Effect size (95% CI) **G1:** 0.06 ± 1.21 **G2:** -0.06 ± 1.01 0.12 (-0.46, 0.70) ESCS initiating behavior requests, mean ± SD **G1:** 16.50 ± 14.33 **G2:** 15.48 ± 13.20 T1 to T3 residualized gain scores, mean ± SD Effect size (95% CI) **G1:** 0.03 ± 0.34 **G2:** -0.03 ± 0.37 0.16 (-0.42, 0.74) PCFP weighted frequency of intentional communication, mean ± SD **G1:** 18.91 ± 20.50 **G2:** 20.75 ± 21.14 T1 to T3 residualized gain scores, mean ± SD Effect size (95% CI) **G1:** 0.18 ± 1.69

	G2: -0.16 ± 2.21 0.15 (-0.57, 0.88) PIA-CV nonverbal communication, mean ± SD **G1:** 2.89 ± 0.67 **G2:** 2.92 ± 0.65 T1 to T3 residualized gain scores, mean ± SD Effect size (95% CI) **G1: -**0.05 ± 0.63 **G2:** 0.06 ± 0.58 -0.19 (-0.81, 0.43) **Adaptive behavior:** Vineland Daily Living SS: **G1:** 77.84 ± 7.07 **G2:** 72.95 ± 10.11 **Motor skills:** Mullen Fine Motor Age (mos): **G1:** 22.00 ± 3.50 **G2:** 21.92 ± 4.09 Vineland Motor SS: **G1:** 83.16 ± 7.36 **G2:** 81.55 ± 9.26 **Educational/ cognitive/ academic attainment:** Mullen Visual Reception Age (mos) **G1:** 22.42 ± 5.75 **G2:** 21.64 ± 6.53 Mullen Early Learning Composite: **G1:** 62.88 ± 18.41

		G2: 64.88 ± 13.94 **Harms:** NR **Modifiers** Treatment effects on child communication games to Time 3 were moderated by children's Time 1 object interest. Children with lower levels of T1 object interest (playing with fewer than 3 toys) had greater facilitated growth in communication; higher levels of object interest (playing with more than 5 or 6 toys) led to growth attenuation

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Castorina et al., 2011 [63] **Country:** Australia **Intervention setting:** Clinic **Enrollment period:** NR **Funding:** NR **Design:** Partially randomized (first 15 participants randomly assigned to one of 3 groups; later recruits assigned based on whether they had an older sibling; if no sibling, randomly assigned to "no sibling" training or wait-list control group)	**Intervention:** Social skills training, adapted from training package by Spence (1995), 8 weekly 2-hour sessions **Assessments:** observed/standardized assessment by study staff; parent report; teacher report **Groups:** **G1:** social skills training with older sibling (no more than 4 years older than subject) **G2:** social skills training alone **G3:** wait-list control **Provider:** Co-therapists (Master of Psychology students) supervised by a clinical psychologist **Treatment manual followed:** NR **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** No	**Inclusion criteria:** • boys between ages of 8 and 12 years • diagnosis of Asperger syndrome **Exclusion criteria:** • female **Sex** • age younger than 9 or older than 12 **Age, mean/yrs ± SD:** 10.30 ± 1.15 **Mental age, mean/yrs (range):** NR **Sex:** M, n (%): 21 (100) F, n (%): 0 **Race/ethnicity, n (%):** White Asian **SES:** Maternal education, n (%): High school College NR Household income, mean (range): NR **Diagnostic approach:** In Study and Referral:	**Social skills:** SSRS-parents (general social skills), mean ± SD: Pre-test, mean ± SE **G1:** NR **G2:** NR **G3:** NR Overall: 33.50 ± 2.16 SSRS-teachers (general social skills), mean ± SD: NR CASP Cues (Social competence), mean ± SD: Pre-test (p=.52) **G1:** 14.00 ± 8.33 **G2:** 15.50 ± 7.69 **G3:** 10.67 ± 7.26 CASP Emotions, mean ± SD: Pre-test, mean ± SE **G1:** NR **G2:** NR **G3:** NR **Overall:** 16.15 ± 1.40	**Social skills:** SSRS-parents (general social skills), mean ± SD: Post-test, mean ± SE **G1:** NR **G2:** NR **G3:** NR **Overall:** 35.96 ± 2.32 3-month follow-up, mean ± SE **G1:** NR **G2:** NR **G3:** NR **Overall:** 40.49 ± 1.34 SSRS-teachers (general social skills), mean ± SD: Post-test NR 3-month follow-up: NR CASP Cues (Social competence), mean ± SD: Post-test **G1:** 38.00 ± 12.46 **G2:** 37.50 ± 6.59 **G3:** 15.33 ± 7.47 Between groups: p<0.001 G1+G2 vs. G3: p<0.001 3-month follow-up: **G1:** 34.43 ± 9.78 **G2:** 38.88 ± 10.56 **G3:** 13.17 ± 8.38 Between groups: p<0.001

Co-interventions held stable during treatment: NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 7 **G2:** 8 **G3:** 6 **N at follow-up:** **G1:** 7 **G2:** 8 **G3:** 6	Referral (previous diagnosis of Asperger syndrome by a specialist diagnostic team) In study (parent questionnaire and cross-referencing tool) Diagnostic tool/method: Autism Spectrum Screening Questionnaire (ASSQ), by semi-structured interview of parents; Australian Scale for Aspberger's Syndrome (ASAS), for cross-referencing, by semi-structured interview of parents **Diagnostic category, n (%):** Autism: 0 PDD-NOS : 0 Aspergers: 21 (100) **Other characteristics**, n (%)**:** Attending mainstream primary school: 21 (100)	**G1 vs. G3:** p=0.003 **G2 vs. G3:** p<0.001 **G1 vs. G2:** p=NS CASP Emotions, mean ± SD: Post-test, mean ± SE **G1:** NR **G2:** NR **G3:** NR **Overall:** 20.84 ± 1.4 Between groups over time: p=NS G1 and G2 vs. baseline: p<0.001 G3 vs. baseline: p=NS 3-month follow-up, mean ± SE **G1:** NR **G2:** NR **G3:** NR **Overall:** 21.32 ± 1.53 **Harms:** NR **Modifiers:** NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: DeRosier et al. 2011[64] **Country:** US **Intervention setting**: Private, community based practice **Enrollment period:** NR **Funding:** NIMH **Design:** RCT	**Intervention:**Social skills intervention, Social Skills GRoup INtervention-High Functioning Autism (S.S.GRIN-HFA) Fifteen 60-minute group social skills sessions during consecutive weeks. Parents attended and participated in four of the sessions (1, 5, 10, and 15) with their child. Children in the traditional S.S.GRIN condition participated in ten 60-min group sessions during consecutive weeks **Assessments:** Parents completed: Demographic questionnaire, Social Responsiveness Scale (SRS), Achieved Learning Questionnaire (ALQ). Child completed Social Dissatisfaction Questionnaire. Parent and Child completed Social Self-efficacy. Completed 2 weeks before intervention and within two weeks after treatment. **Groups:**	**Inclusion criteria:** • between ages of 8 and 12 years • prior diagnosis of high functioning autism, Asperger's Disorder, or Pervasive Developmental Disorder-NOS (by parent report) • IQ ≥ 85 **Exclusion criteria:** • children with CBCL • Aggressive scale T score > 70 **Age, mean ± SD yrs (range): (**8-12 years) **G1:** 10.2 ± 1.3 **G2:** 9.9 ± 1.1 **Mental age, mean/yrs (range):** IQ ≥ 85 **Sex:** Male, % **G1:** 96.3 **G2:** 100 **G1+G2:** 98.2 **Race/ethnicity, %:** White **G1:** 89 **G2:** 96 Asian **G1:** 7	**Mean ± SD:** Parent report: SRS total score **G1:** 70.4 ± 6.1 **G2:** 68.0 ± 5.7 Awareness **G1:** 70.1 ± 7.2 **G2:** 69.5 ± 7.4 Cognition: **G1:** 70.9 ± 6.9) **G2:** 69.7 ± 7.6 Communication: **G1:** 69.6 ± 6.6 **G2:** 66.0 ± 5.1 p<0.05 Motivation: **G1:** 65.4 ± 7.0 **G2:** 64.6 ± 10.1 Mannerisms: **G1:** 61.0 ± 8.2 **G2:** 58.7 ± 9.7 Self-efficacy: **G1:** 2.6 ± 0.7 **G2:** 2.8 ± 0.7 ALQ: **G1:** 1.2 ± 0.3 **G2:** 1.4 ± 0.4 Child report: Self-efficacy:	**Effect size:** **Standardized change scores over time** Parent report: SRS, mean ± SD, Effect size (Cohen's d) Awareness **G1:** -0.33 ± 1.17 **G2:** 0.38 ± 0.86 ES=-.69 p< 0.05 Cognition: **G1:** -0.13 ± 1.22 **G2:** 0.24 ± 0.97 ES= NS p= NS Communication: **G1:** -0.38 ± 1.07 **G2:** 0.50 ± 0.78 ES=-0.94 p< 0.01 Motivation: **G1:** -0.22 ± 0.77 **G2:** 0.31 ± 0 .82 ES= -0.67 p< 0.05 Mannerisms: **G1:** -0.35 ± 1.18 **G2:** 0.35 ± 0.86 ES= -0.68 p< 0.05

G1: S.S.GRIN-HFA **G2:** Traditional S.S.GRIN-control **Provider:** Trained group leaders with experience conducting social skills groups with children **Treatment manual followed:** yes **Defined protocol followed:** yes **Measure of treatment fidelity reported**: yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 27 **G2:** 28 **N at follow-up:** **G1:** 27 **G2:** 28	**G2:** 0 African American **G1:** 0 **G2:** 4 American Indian **G1:** 4 **G2:** 0 **SES:** Maternal education College degree or greater, % **G1:** 66.7 **G2:** 88.5 **G1+G2:** 78.2 Household income, % $25,001-$50,000 **G1:** 22.2 **G2:** 10.7 **G1+G2:** 16.4 $50,001-$75,000 **G1:** 18.5 **G2:** 10.7 **G1+G2:** 14.5 $75,001-$100,000 **G1:** 22.2 **G2:** 35.7 **G1+G2:** 29.1 >$100,00 **G1:** 37 **G2:**: 42.9 **G1+G2:** 40 **Diagnostic approach:** Referral **Diagnostic tool/method:**	**G1:** 2.8 ± 0.6 **G2:** 2.5 ± 0.8 Social Dissatisfaction: **G1:** 54.6 ± 10.3 **G2:** 55.0 ± 11.2	ALQ: **G1:** 0.33 ±(.86) **G2:** -0.31 ±(.84) ES= 0.75 p< 0.05 Self-efficacy: **G1:** 0.28 ±(1.06) **G2:** -0.25 ±(1.01) ES = 0.51 Child report Self-efficacy: **G1:** -0.05 ± 1.06 **G2:** 0.08 ± 1.00 ES = NS p= NS Social dissatisfaction: **G1:** 0.08 ± 1.23 **G2:** -0.07 ± 0.79 ES= NS p= NS **Harms:** NR **Modifiers:** NR

SCQ, ASSQ, CAST

Diagnostic category, %:
Autism-high functioning: 42
PDD-NOS: 16
Asperger syndrome: 38

Other characteristics, n (%)**:** NR

Comments: Three children in G1 dropped out of study and were excluded from analysis. Two parents in G2 were excluded from parent report analysis (mother filled out pre-assessments and father completed post-assessments).

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Drahota et al. 2011[65] **Country:** US **Intervention setting:** clinic **Enrollment period:** NR **Funding:** NIMH, Cure Autism Now Foundation, UCLA Center for Autism Research and Training **Design:** RCT Note: See earlier studies reporting on this population[66, 67] in 2011 AHRQ review[9]	**Intervention:** Cognitive behavioral therapy, 16 weekly sessions, 90 min (30 with child and 60 with parents) implementing the Building Confidence CBT program modified for use with children with ASD **Assessments:** ADIS-C/P Clinical Severity Rating scale, VABS, Parent Child Interaction Questionnaire (PCIQ); Assessments at baseline and at final day or treatment or within one week; for control group post assessments were completed after 3 months **Groups:** **G1:** intervention **G2:** waitlist **Provider:** Therapists 11 doctoral students in clinical or educational psychology and 2 doctoral level psychologists **Treatment manual followed:** Yes **Defined protocol followed:** NR	**Inclusion criteria:** • met research criteria for diagnosis of autism, Asperger syndrome or PDD-NOS • met research criteria for one of the following: separation anxiety disorder, social phobia or obsessive compulsive disorder • not taking any psychiatric medicine at baseline assessment or were taking a stable dose of psychiatric medicine (at least one month of same dosage prior to baseline) • if medication was being used, maintained same dosage during study **Exclusion criteria:** • verbal IQ < 70 (assessed in previous testing, or questions noted by independent examiner at baseline, on basis of Wechsler Intelligence Scale for Children IV • currently in psychotherapy or	VABS- total daily living skills, mean ± SD **G1:** 93.47 ± 29.91 **G2:** 97.43 ± 23.91 Mean standard score **G1:** 50.06 **G2:** 55.61 Mean age equivalency **G1:** 5.2 years **G2:** 5.4 years VABS- personal daily living skills, mean ± SD **G1:** 55.54 ± 10.85 **G2:** 57.49 ± 9.27 Mean age equivalency **G1:** 4.1 years **G2:** 4.5 years PCIQ-parental involvement Mean raw score ± SD **G1:** 13.53 ± 3.78 **G2:** 14.30 ± 3.78	**Post-treatment** VABS- total daily living skills, mean ± SE **G1:** 109.63 ± 4.07 **G2:** 98.80 ± 3.50 Mean standard score **G1:** 60.24 **G2:** 55.62 Mean age equivalency **G1:** 6.0 years **G2:** 5.7 years VABS- personal daily living skills, mean ± SE **G1:** 62.81 ± 1.54 **G2:** 58.30 ± 1.32 Mean age equivalency **G1:** 5.0 years **G2:** 4.6 years PCIQ-parental involvement Mean raw score ± SE **G1:** 11.93 ± 0.55 **G2:** 13.53 ± 0.48 **3-month follow-up (n=10 families in G1 only)** VABS- total daily living skills, mean ± SD **G1:** 114.24 ± 25.66 Mean standard score

Measure of treatment fidelity reported: NR **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 17 **G2:** 23 **N at follow-up:** **G1:** 14 (82) **G2:** 22 (96)	social skills training or receiving behavioral interventions such as applied behavioral analysis • family currently in family therapy or parenting class • child began taking psychiatric medication or changed dosage during the intervention • child or parents appeared unable to participate in intervention program **Age, mean/yrs (range):** **G1:** 9.18 ± 1.42 **G2:** 9.22 ± 1.57 **Mental age, mean/yrs (range):** NR **Sex:** M, n (%): **G1:** 12 (71) **G2:** 15 (65) **Race/ethnicity, n (%):** White **G1:** 8 (47) **G2:** 11 (48) Latino/Latina **G1:** 2 (12) **G2:** 3 (13) Asian **G1:** 4 (23)	**G1:** 70.00 Mean age equivalency **G1:** 6.7 years VABS- personal daily living skills, mean ± SD **G1:** 63.65 ± 9.33 Mean age equivalency **G1:** 5.2 years PCIQ-parental involvement Mean raw score ± SD **G1:** 10.89 ± 2.93 **Harms:** NR **Modifiers:** NR

G2: 2 (9)

African American
G1: 0
G2: 1 (4)

Multiracial/other
G1: 3 (18)
G2: 6 (26)

SES:
Parental education, n (%):
Graduated College
G1: 12 (71)
G2: 13 (60)

Household income, (n=37):
< $40,000
G1+G2: 9 (24.3)

$40,001-$90,000
G1+G2: 10 (27.1)

Over $90,000
G1+G2: 18 (48.6)

Diagnostic approach:
Referral

Diagnostic tool/method:

Diagnostic category, n (%):
Autistic disorder
G1: 9 (53)
G2: 11 (48)

PDD-NOS
G1: 6 (35)
G2: 11 (48)
Asperger syndrome

	G1: 2 (12) **G2:** 1 (4) **Other characteristics**, n (%)**:** NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Zachor and Itzchak, 2010 [68, 69] **Country:** Israel **Intervention setting:** Preschool **Enrollment period:** NR **Funding:** Private support (Mr. Dov Moran) **Design:** Prospective cohort	**Intervention:** Applied Behavioral Analysis (ABA) or eclectic (integration of several intervention approaches) interventions implemented in autism-specific preschool settings; 8 hours per day for 1 year **Assessments:** parent; clinician **Groups:** **G1:** ABA **G2:** eclectic **Provider:** **G1:** Program supervisors, trained therapists, speech and language pathology, occupational therapy and special education preschool teachers, and parents (for home treatment) **G2:** Clinical psychologist, special education preschool teacher, speech and language pathology, occupational therapy, cognitive trainer, music therapist, and teacher's aids. **Treatment manual followed:** NR	**Inclusion criteria:** • clinical diagnosis of autism based on DSM-IV criteria and cut-off points on the ADI-R • age 15-35 months **Exclusion criteria:** • additional major medical diagnoses • incomplete post-intervention assessments **Age, mean/months ± SD (range):** **G1:** 25.1 ± 3.9 (17-35) **G2:** 26.0 ± 4.6 (15-33) **Mental age, mean/yrs (range):** NR **Sex:** M, n (%): 71 (91) F, n (%): 7 (8) **Race/ethnicity, n (%):** NR **SES:** Maternal education, years ± SD (range): **G1:** 14.3 ± 2.2 (11-20) **G2:** 15 ± 2.7 (11-22) Paternal education, years ±	**Overall ratings:** **Global Rating of Severity, mean ± SD (range):** ADOS new algorithm **G1:** 20.9 ± 4.3 (10-26) **G2:** 20.1 ± 4.6 (10-26) **G1+G2**: 20.5 ± 4.4 ADOS severity score **G1+G2**: 8.4 ± 2.0 **Social skills, mean ± SD:** Vineland-Socialization raw score **G1:** 25.8 ± 5.5 **G2:** 28.0 ± 6.2 Vineland-Socialization standard score **G1:** 67.8 ± 7.7 **G2:** 70.7 ±7.7 **Communication/ language, mean ± SD:** MSEL-Receptive language raw score **G1:** 20.6 ± 9.7 **G2:** 17.5 ± 8.5 MSEL-Receptive language standard score **G1:** 34.4 ± 15.2 **G2:** 29.6 ± 14.8 MSEL-Expressive language raw score	**Overall ratings:** **Global Rating of Severity mean ± SD:** ADOS new algorithm **G1:** NR **G2:** NR **G1+G2**: 17.9 ± 5.0 ADOS severity score* **G1+G2**: 7.8 ± 1.9 ADOS-improved classification **G1:** 3 (6.7) **G2:** 2 (6) **Diagnosis stability, n (%):** ADOS-autism diagnosis **G1+G2**: 71 (91) **Social skills, mean ± SD:** Vineland-Socialization Socialization raw score **G1:** 38.8 ± 10.7 **G2:** 42.4 ± 11.5 Vineland-Socialization standard score **G1:** 69.6 ± 12.4 **G2:** 77.4 ± 14.4 **Communication/ language, mean ± SD:** MSEL-Receptive language raw score **G1:** 28.7 ± 10.7

Defined protocol followed: NR **Measure of treatment fidelity reported:** No **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 45 **G2:** 33 **N at follow-up:** **G1:** NR **G2:** NR **N for each measure:** ADOS baseline: 78 follow-up: 77 Vineland baseline: 71 follow-up: 75 MSEL baseline: 71 follow-up: 69	SD (range): **G1:** 14.4 ± 2.8 (8-20) **G2:** 14.9 ± 3.1 (10-20) Household income, mean (range): NR **Diagnostic approach:** In Study Diagnostic tool/method: Autism Diagnostic Interview-Revised (ADI-R) and Autism Diagnostic Observation Schedule (ADOS) **Diagnostic category, n (%):** Autism: 78 (100) PDD-NOS Aspergers **Other characteristics**, n (%)**:** NR	**G1:** 17.0 ± 8.4 **G2:** 16.8 ± 7.8 MSEL-Expressive language standard score **G1:** 28.8 ± 11.3 **G2:** 31.4 ± 12.5 MSEL-Verbal **G1+G2**: 60.9 ± 24.4 Vineland-Communication raw score **G1:** 19.0 ± 9.0 **G2:** 22.8 ± 12.1 Vineland-Communication standard score **G1:** 67.0 ± 7.8 **G2:** 69.5 ± 10.7 **Adaptive behavior, mean ± SD (range):** Vineland composite score **G1:** 66.2 ± 9.6 (49-75) **G2:** 68.6 ± 6.3 (59-81) **G1+G2**: 67.4 ± 6.4 Vineland-Daily Living raw score **G1:** 17.4 ± 6.7 **G2:** 19.5 ± 6.5 Vineland-Daily Living standard score **G1:** 67.7 ± 7.0 **G2:** 69.4 ± 6.0 **Motor skills, mean ± SD:** MSEL-Fine motor raw	**G2:** 26.1 ± 8.2 MSEL-Receptive language standard score **G1:** 40.1 ± 14.2 **G2:** 37.7 ± 12.8 MSEL-Expressive language raw score **G1:** 26.8 ± 11.0 **G2:** 25.9 ± 10.0 MSEL-Expressive language standard score **G1:** 35.6 ± 15.0 **G2:** 39.0 ± 14.3 MSEL-Verbal **G1+G2**: 75.0 ± 27.0 Vineland-Communication raw score **G1:** 42.0 ± 16.3 **G2:** 44.3 ± 15.7 Vineland-Communication standard score **G1:** 72.9 ± 14.7 **G2:** 78.8 ± 16.2 **Repetitive behavior:** NR **Problem behavior:** NR **Adaptive behavior, mean ± SD (range):** Vineland composite score **G1:** NR **G2:** NR **G1+G2**: 68.9 ± 13.0

	score **G1:** 25.2 ± 4.9 **G2:** 24.2 ± 4.1 MSEL-Fine motor standard score **G1:** 33.0 ± 14.0 **G2:** 34.1 ± 12.9 Vineland-Motor skills raw score **G1:** 33.5 ± 5.8 **G2:** 35.1 ± 4.6 Vineland-Motor skills standard score **G1:** 86.2 ± 11.4 **G2:** 88.1 ± 11.0 **Sensory, mean ± SD:** MSEL-Visual raw score **G1:** 29.9 ± 5.3 **G2:** 25.6 ± 4.7 MSEL-Visual standard score **G1:** 42.3 ± 12.7 **G2:** 37.7 ± 12.1 **Educational/ cognitive/ academic attainment, mean ± SD (range):** MSEL-cognitive composite **G1:** 72.2 ± 19.2 (49-135) **G2:** 73.3 ± 22.2 (49-132) MSEL Nonverbal **G1+G2**: 73.9 ± 23.7	Vineland-Daily Living-raw score **G1:** 35.8 ± 13.5 **G2:** 36.7 ± 15.2 Vineland-Daily Living standard score **G1:** 67.8 ± 10.9 **G2:** 73.0 ± 14.6 **Commonly occurring co-morbidities:** NR **Medical:** NR **Motor skills, mean ± SD:** MSEL-Fine motor raw score **G1:** 30.7 ± 6.0 **G2:** 27.9 ± 4.6 MSEL-Fine motor standard score **G1:** 33.0 ± 14.6 **G2:** 33.7 ± 14.5 Vineland-Motor skills raw score **G1:** 43.1 ± 7.0 **G2:** 45.8 ± 6.1 Vineland-Motor skills standard score **G1:** 72.0 ± 12.9 **G2:** 84.5 ± 13.0 **Sensory, mean ± SD:** MSEL-Visual raw score **G1:** 35.9 ± 7.5 **G2:** 32.6 ± 7.4

	MSEL-Visual standard score **G1:** 42.4 ± 18.2 **G2:** 43.1 ± 17.0 **Educational/ cognitive/ academic attainment, mean ± SD:** MSEL-cognitive composite **G1:** NR **G2:** NR MSEL Nonverbal **G1+G2**: 75.5 ± 29.2 **Harms:** NR **Modifiers:** Cognitive and adaptive ability, maternal age

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Kovshoff et al. 2011[70] **Country:** UK **Intervention setting:** Home, school, clinic **Enrollment period:** NR **Funding:** Esmee Fairbairn Foundation, Research Autism, Autism and Developmental Disorders Education Research **Design:** Prospective Cohort Note: See earlier study[71] reporting on this population in 2011 AHRQ review[9]	**Intervention:** EIBI- 24 month study. Follow-up 2 years after study ended. **Assessments:** Stanford-Binet Intelligence Scale – Fourth Edition, Bayley Scales of Infant Development-Second Edition; Vineland Adaptive Behavior Scale-Survey form; Reynell Developmental Language Scales – Third Edition; Positive Social Subscale of the Nisonger Child Behavior Rating Form, Autism Diagnostic Interview-Revised, Developmental Behavior Checklist **Groups:** **G1:** EIBI intervention (mix of university-based and private providers) **G2:** treatment as usual **Provider:** University-based or privately hired behavioral intervention providers **Treatment manual followed:** NR	**Inclusion criteria:** • meet criteria for diagnosis of autism based on both ADI-R and independent clinical assessment and diagnostic procedure • no chronic medical conditions • reside in family home **Exclusion criteria:** • see above **Age, mean/yrs (range):** At follow-up: Mean of 7 years, 2 months (range: 6.5-8 years) **Mental age, mean/yrs (range):** NR **Sex:** NR Race/ethnicity, n (%): NR **SES:** Maternal education, n (%): High school College Household income, mean (range): **Diagnostic approach:** In Study/Referral	IQ, mean ± SD **G1:** 61.43 ± 16.43 **G2:** 63.83 ± 13.98 Vineland Composite **G1:** 60.22 ± 5.82 **G2:** 57.17 ± 7.05 Vineland Communication **G1:** 61.52 ± 7.56 **G2:** 58.17 ± 8.63 Vineland Daily Living **G1:** 63.26 ± 5.40 **G2:** 62.22 ± 8.14 Vineland Socialization **G1:** 63.30 ± 6.74 **G2:** 59.94 ± 7.94 Nisonger Child Behavior Rating Form: positive social behavior Mother **G1:** 10.57 ± 4.24 **G2:** 9.61 ± 3.50 Father **G1:** 8.94 ± 3.47 **G2:** 8.64 ± 3.79 DBC total Mother **G1:** 50.26 ± 22.75 **G2:** 65.61 ± 18.70 Father **G1:** 46.67 ± 22.15	Two year follow-up[a] IQ, mean ± SD **G1:** 64.65 ± 33.04 **G2:** 61.94 ± 31.09 *p*= 0.339 DBC total Mother **G1:** 53.70 ± 21.13 **G2:** 63.56 ± 26.39 *p*= 0.627 Father **G1:** 48.86 ± 26.21 **G2:** 56.14 ± 21.22 *p*= 0.719 **Social skills:** Nisonger Child Behavior Rating Form: positive social behavior Mother **G1:** 14.87 ± 5.29 **G2:** 11.33 ± 5.26 *p*= 0.059 Father **G1:** 14.73 ± 6.70 **G2:** 11.64 ± 7.31 *p*= 0.321 **Adaptive behavior:** Vineland Composite **G1:** 55.13 ± 19.40 **G2:** 49.5 ± 17.39 *p*= 0.79

Defined protocol followed: NR **Measure of treatment fidelity reported:** NR **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 23 **G2:** 21 **N at follow-up:** **G1:** 23 **G2:** 18	Diagnostic tool/method: **Diagnostic category, n (%):** Autism PDD-NOS Aspergers **Other characteristics, n (%):** NR	**G2:** 57.15 ± 16.23	Vineland Communication **G1:** 62.65 ± 25.11 **G2:** 57.72 ± 24.54 *p*= 0.784 Vineland Daily Living **G1:** 52.35 ± 19.61 **G2:** 43.67 ± 18.15 *p*= 0.177 Vineland Socialization **G1:** 62.57 ± 16.93 **G2:** 59.33 ± 15.58 *p*= 0.822 **Harms:** NR **Modifiers:** NR

Comments: [a] p-values refer to ANCOVA that compared group scores at 24-month treatment termination and two year follow-up.See Remington et al. 2007 for original study data.

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Murdock and Hobbs, 2011 [72] **Country:** US **Intervention setting:** Autism treatment center with preschool program **Enrollment period:** NR **Funding:** NR **Design:** Prospective cohort	**Intervention:** Picture Me Playing; consisted of four 15-minute group sessions and one 5-minute individualized session with a typically developing peer. Group sessions included 3 participants and 2 typical peers at a time. Sessions included story and role-playing opportunities. **Assessments:** observation **Groups:** **G1:** Picture Me Playing **G2:** comparison group **Provider:** Second author implemented the intervention **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** NR **Co-interventions held stable during treatment:**	**Inclusion criteria:** • ages 55-75 months • diagnosis of autism or PDD-NOS • able to follow group directed instructions • able to comply and attend to group activities **Exclusion criteria:** NR **Age, mean/months ± SD:** **G1:** 69.33 ± 5.9889 **G2:** 62.17 ± 6.2102 **Mental age, mean/yrs (range):** NR **Sex:** M, n (%): **G1:** 5 (83.3) **G2:** 5 (83.3) F, n (%): **G1:** 1 (16.7) **G2:** 1 (16.7) **Race/ethnicity, n (%):** White: NR Asian: NR **SES:** Maternal education, n (%): NR Household income, mean	**Communication/ language:** Types of utterances, n: Total utterances: **G1:** 250 **G2:** 206 Structural: **G1:** 141 **G2:** 139 Play dialogue: **G1:** 50 **G2:** 28 Sound effects: **G1:** 38 **G2:** 28 Self-talk: **G1:** 21 **G2:** 11	**Communication/ language:** Types of utterances, n: Total utterances: **G1:** 307 **G2:** 304 p=NS Structural: **G1:** 89 **G2:** 176 p=NS Play dialogue: **G1:** 180 **G2:** 66 p=NS Sound effects: **G1:** 29 **G2:** 36 p=NS Self-talk: **G1:** 9 **G2:** 26 p=NS Types of utterances, percent change from baseline: Total utterances: **G1:** 23% **G2:** 48% p=NS Structural

NR	(range): NR	**G1:** -37% **G2:** 27% p=NS
Concomitant therapies, n (%): NR	**Diagnostic approach:** Referral	
N at enrollment: **G1:** 6 **G2:** 6	Diagnostic tool/method: NR	Play dialogue **G1:** 260% **G2:** 136% p=0.041
N at follow-up: **G1:** 6 **G2:** 6	**Diagnostic category, n (%):** Autism or PDD-NOS: **G1:** 6 (100) **G2:** 6 (100)	Sound effects **G1:** -24% **G2:** 29% p=NS
	Other characteristics, mean ± SD: **PPVT-4:** **G1:** 84.5 ± 11.077 **G2:** 88.5 ± 7.6092	Self-talk **G1:** -57% **G2:** 13.6% p=NS
	K-BIT: **G1:** 86.5 ± 5.8907 **G2:** 72.33 ± 13.456 Peers: **G1:** 105.5 ± 13.026 **G2:** 108.75 ± 7.5884	**Harms:** NR **Modifiers:** NR
	PLS-4: **G1:** 85.667 ± 13.064 **G2:** 86.5 ± 13.368	

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Pajareya et al. 2011[73] **Country:** Thailand **Intervention setting:** Home **Enrollment period:** NR **Funding:** NR **Design:** RCT with four groups stratified based on age (24-47 months, 48-72 months) and symptom severity: (mild autism: Childhood Autism Rating Scale score of 30-40; severe autism: CARS score of 41-60)	**Intervention:** Parent-administered DIR/Floortime for an average of 15.2 hours/wk for 3 months **Assessments:** Functional Emotional Assessment Scale, Childhood Autism Rating Scale, Functional Emotional Questionnaires **Groups:** **G1:** DIR/Floortime **G2:** treatment-as-usual **Provider:** Parents (attended one day training workshop, received 3-hour DVD lecture, and had two one-hour home visits with a trainer) **Treatment manual followed:** Individualized manual with activity suggestions based upon Greenspan's affect-based language curriculum **Defined protocol followed:** Yes **Measure of treatment**	**Inclusion criteria:** • met clinical criteria for autistic disorders according to DSM-IV criteria • age 2-6 years **Exclusion criteria:** • additional medical diagnosis (e.g. genetic syndromes, diagnosed hearing impairment, diagnosed visual impairment or seizures) • geographically inaccessible for follow-up visits • parents not literate or with known chronic psychiatric or physical illness **Age, mean/months ± SD:** **G1:** 56.6 ± 10.1 **G2:** 51.5 ± 13.9 **Mental age, mean/yrs (range):** NR **Sex:** M, n (%): **G1:** 15 (94) **G2:** 13 (81) F, n (%):	**CARS, mean ± SD** **G1:** 37.2 ± 6.2 **G2:** 39.7 ± 6.6 **FEAS, mean ± SD** **G1:** 24.4 ± 12.7 **G2:** 23.5 ± 12.6 **FEDQ, mean ± SD** **G1:** 44.0 ± 12.9 **G2:** 40.7 ± 15.3	**Severity** CARS, mean changes ± SD **G1:** 2.9 ± 2.0 **G2:** 0.8 ±1.2 *p*=0.002 FEAS, mean changes ± SD **G1:** 7.0 ± 6.3 **G2:** 1.9 ±6.1 *p*=0.031 FEDQ, mean changes ± SD **G1:** 7.7 ± 8.1 **G2:** 0.8 ±1.4 *p*=0.006 **Harms:** NR **Modifiers:** NR

fidelity reported: Yes	**G1:** 1 (6) **G2:** 3 (19)
Co-interventions held stable during treatment: NR	**Race/ethnicity, n (%):** NR (Thai)
Concomitant therapies, n (%): On medication **G1:** 5 (31) **G2:** 5 (31)	**SES:** Maternal education, n (%): Bachelor degree or higher **G1:** 10 (62.5) **G2:** 14 (87.5)
11 children in G1 continued to receive one-on-one treatment intervention based on behavioral or discrete trial principles throughout the study period.	Household income, mean (range): NR
N at enrollment: **G1:** 16 **G2:** 16	**Diagnostic approach:** Diagnosis confirmed by developmental pediatrician Diagnostic tool/method: DSM-IV
N at follow-up: **G1:** 15 **G2:** 16	**Diagnostic category, n (%):** Autism **G1:** 13 (81) **G2:** 10 (62.5) PDD-NOS **G1:** 3 (19) **G2:** 6 (37.5) Aspergers **0**
	Other characteristics, n (%)**:** Overall status No affective engagement **G1:** 0 **G2:** 0

	Only intermittent engagement **G1:** 3 **G2:** 4 Intermittent reciprocal communication, no symbolization **G1:** 3 **G2:** 6 Islands of symbolization **G1:** 10 **G2:** 6 Associated with moderate to severe motor planning problem **G1:** 5 **G2:** 6 Participation in special education (or regular) preschool program **G1:** 11 **G2:** 11 Average hours per week of paramedical services (e.g., speech therapy), mean ± SD **G1:** 3.1 ± 1.8 **G2:** 3.3 ± 1.4

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Roberts et al. 2011[74] **Country:** Australia **Intervention setting:** 1) home 2) center **Enrollment period:** 2006 & 2007 (two consecutive 12-month offerings of program) with recruitment in late 2005 and late 2006 **Funding:** Australian Research Council Linkage Projects grant; Autism Spectrum Australia (Aspect) **Design:** RCT	**Intervention:** Two variations of the Building Blocks® program, including an individualized home-based program (40 weeks duration, 2 h visit every 2 weeks, 20 sessions max) or a small group center-based program with parent training and support group (40 weeks duration, weekly 2 h sessions) **Assessments:** Autism Diagnostic Observation Schedule, Beach Centre Family Quality of Life Scale, Vineland Adaptive Behavior Scales-II, Reynell Developmental Language Scales III, The Pragmatics Profile of Everyday Communication, Developmental Behavior Checklist, Parenting Stress Index, Parent Perception Questionnaire, Parent interview **Groups:** **G1:** individualized home-based program **G2**: small group center-based program combined with parent training and	**Inclusion criteria:** • preschool age • diagnosis of Autistic Disorder, Asperger or PDD-NOS (DSM-IV) by referring clinician • home within reasonable distance of center-based group • child's readiness for center-based program (determined by parents and staff) **Exclusion criteria:** • see inclusion criteria **Age mean/months (range):** **G1:** 41.5 (26.5 – 59.4) **G2**: 43.1 (26.3 – 60.0) **G3**: 43.7 (27.6 – 60.3) **Mental age:** Griffiths developmental quotient, mean ± SD: **G1:** 57 ± 11.7 **G2**: 66 ± 17.7 **G3**: 63.3 ± 15.5 **Sex, n (%):** M: NR (90.5%) F: NR (9.5%) **Race/ethnicity, n (%):** NR **SES:** Maternal education, n (%),	**Social skills, mean ± SD:** VABS social **G1**: 68.7 ± 7.3 **G2**: 70.1 ± 7.3 **G3**: 70.8 ± 9.9 **Communication/ language, mean ± SD:** VABS communication **G1:** 64.4 ± 12.8 **G2**: 66.9 ± 12.5 **G3**: 68.5 ± 17.0 Reynell comprehension, standard score: **G1:** 4.2 ± 9.2 **G2**: 5.5 ± 10.6 **G3**: 7.2 ± 15.2 Reynell comprehension, raw score: **G1:** 6.9 ± 9.7 **G2**: 11.3 ± 13.8 **G3**: 12.2 ± 14.9 Reynell expression, standard score: **G1:** 3.4 ± 8.3 **G2**: 8.2 ± 16.6 **G3**: 6.0 ± 10.9 Reynell expression, raw score: **G1:** 3.2 ± 5.4 **G2**: 6.9 ± 9.9 **G3**: 5.8 ± 7.9	**Social skills, mean ± SD:** VABS social **G1:** 66.4 ± 7.7 **G2**: 72.6 ± 11.2 **G3**: 73.1 ± 10.8 **G1** vs. **G2**: p=0.02 **G1** vs. **G3**: p=0.02 **G2** vs. **G3**: p=NS 3-group comparison: p=0.03 **Communication/ language, mean ± SD:** VABS communication **G1:** 68.4 ± 15.6 **G2**: 76.1 ± 17.1 **G3**: 74.2 ± 15.5 **G1 vs. G2**: p=NS **G1 vs. G3**: p=NS **G2 vs. G3**: p=NS 3-group comparison: p=NS Reynell-comprehension, standard score: **G1:** 2.6 ± 8.4 **G2**: 10.5 ± 17.4 **G3**: 5.7 ± 12.1 **G1 vs. G2**: p=0.03 **G1 vs. G3**: p=NS **G2 vs. G3**: p=NS 3-group comparison: p=NS Reynell-comprehension, raw score

support group **G3**: waitlist (non-randomized treatment comparison) **Provider:** Multidisciplinary teams of teachers, speech pathologists, occupational therapists and psychologists **Treatment manual followed:** **G2** only: Autism Association of NSW manual (2004) – child and parent components **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** No Concomitant therapies, mean number ± SD: ASD-specific interventions used during intervention period: **G1:** 0.22 ± 0.42 **G2**: 0.14 ± 0.35 **G3**: 0.54 ± 0.79 Educational interventions used during intervention period:	(n=73): High school: 10 (13.7) College/post-high school: 28 (38.4%) Bachelors: 23 (31.5) Postgraduate: 12 (16.4) Household income, n (%), (n=78): >$75,000: 45 (57.7) $60,000-$70,000: 10 (12.8) $50,000-$60,000: 11 (14.1) $40,000-$50,000: 4 (5.1) <$40,000: 8 (10.3) Language spoken at home. n (%): Language other than English exclusively: 2 (2.6) Language in addition to English: 12 (15.4) Family members supported by income, mean ± SD (n=78): 4.0 ± 1.2 SES (ranking within New South Wales), mean ± SD (n=80): 73.0 ± 23.0 Mother's age, mean/yrs ± SD (n=75): 36.6 ± 4.3 **Diagnostic approach:** In Study and Referral Referral of autism and ASD diagnosed by clinicians; diagnosis in-study	Pragmatics Profile, total Q range: **G1:** 50.4 ± 17.5 **G2**: 58.3 ± 16.8 **G3**: 56.7 ± 16.2 **Adaptive behavior, mean ± SD:** Developmental Behavior Checklist, total: **G1:** 44.7 ± 19.0 **G2**: 58.5 ± 20.4 **G3**: 43.9 ± 21.9	**G1:** 17.5 ± 6.3 **G2**: 23.7 ± 19.9 **G3**: 22.0 ± 17.8 **G1 vs. G2**: p=NS **G1 vs. G3**: p=NS **G2 vs. G3**: p=NS 3-group comparison: p=NS Reynell-expression, standard score: **G1:** 2.8 ± 7.5 **G2**: 7.0 ± 15.1 **G3**: 4.4 ± 8.7 **G1 vs. G2**: p=NS **G1 vs. G3**: p=NS **G2 vs. G3**: p=NS 3-group comparison: p=NS Reynell-expression, raw score: **G1:** 8.8 ± 8.9 **G2**: 11.4 ± 10.9 **G3**: 11.1 ± 9.9 **G1 vs. G2**: p=NS **G1 vs. G3**: p=NS **G2 vs. G3**: p=NS 3-group comparison: p=NS Pragmatics Profile, total Q range: **G1:** 62.8 ± 19.4 **G2**: 73.0 ± 19.0 **G3**: 72.2 ± 18.8 **G1 vs. G2**: p=NS **G1 vs. G3**: p=NS **G2 vs. G3**: p=NS 3-group comparison: p=NS

G1: 2.37 ± 1.28 **G2**: 2.41 ± 1.50 **G3**: 3.11 ± 1.64 **N at enrollment:** **G1:** 34 **G2**: 33 **G3**: 28 **N at follow-up:** **G1:** 27 **G2**: 29 **G3**: 28	Diagnostic tool/method: DSM-IV (referral), ADOS (in-study) **Diagnostic category, n (%):** Autistic disorder: **G1:** 24 (87.5) **G2:** 20 (69.0) **G3:** 17 (60.7) ASD: **G1:** 4 (14.3) **G2:** 4 (13.8) **G3:** 5 (17.9) Non ASD: **G1:** 0 (0) **G2:** 5 (17.2) **G3:** 6 (21.4) **Other characteristics**, n (%)**:** NR	**Adaptive behavior:** Developmental Behavior Checklist, total: **G1:** 52.9 ± 29.3 **G2**: 55.7 ± 19.5 **G3**: 42.9 ± 24.3 **G1 vs. G2**: p=NS **G1 vs. G3**: p=NS **G2 vs. G3**: p=NS 3-group comparison: p=NS **Harms:** NR **Modifiers:** NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Scarpa et al. 2011[75] **Country:** US **Intervention setting:** clinic **Enrollment period:** NR **Funding:** NR **Design:** RCT	**Intervention:** CBT, one hour group meetings for 9 consecutive weeks. Intervention focused on skill-building via affective education, stress management, and understanding expression of emotions. Parent group meetings occurred simultaneously with children's sessions. **Assessments:** Child's emotion regulation ability **Groups:** **G1:** intervention **G2:** wait list control **Provider:** Therapists (3 clinical graduate students and two trained staff members) supervised by licensed clinical psychologist **Treatment manual followed:** Yes **Defined protocol followed:** No **Measure of treatment**	**Inclusion criteria:** • meet ASD criteria on ADOS • 5-7 years old at time of intervention • In kindergarten or first grade • verbal and able to understand and follow verbal directions **Exclusion criteria:** • see above **Age,/yrs (range):** (4.5-7 years) **Mental age, mean/yrs (range):** NR **Sex:** M, 9 (%) F, 2 (%) **Race/ethnicity, n (%):** White, 11 (100) **SES:** Maternal education: NR Household income, median (range): $85,000 ($14,400-$175,000) **Diagnostic approach:** In Study/Referral	Emotion Regulation Checklist Emotion Regulation Subscale **G1+ G2:** 22.82 ± 2.56 Negativity/Lability Subscale **G1+ G2:** 38.00 ± 5.33 Behavioral Monitoring Sheet Frequency of episodes per hour **G1+ G2:** 0.31 ± 0.16 Duration in minutes per episode **G1+ G2:** 7.13 ± 6.68 Ben and the Bullies and James and the Reading Group Vignettes Quantity scores **G1+ G2:** 1.36 ± 0.81 Self Confidence Rating Scale Parental self-confidence-anger **G1+ G2:** 5.60 ± 1.58 Parental self-confidence-anxiety **G1+ G2:** 4.73 ± 1.90 Confidence in child- anger **G1+ G2:** 3.73 ± 1.49	**Problem behavior:** Emotion Regulation Checklist Emotion Regulation Subscale **G1+ G2:** 24.91 ± 6.17 Negativity/Lability Subscale **G1+ G2:** 33.73 ± 5.00 Behavioral Monitoring Sheet Frequency of episodes per hour **G1+ G2:** 0.18 ± 0.09 Duration in minutes per episode **G1+ G2:** 3.32 ± 2.20 Ben and the Bullies and James and the Reading Group Vignettes Quantity scores **G1+ G2:** 3.27 ± 2.24 Self Confidence Rating Scale Parental self-confidence-anger **G1+ G2:** 7.20 ± 1.81 Parental self-confidence-anxiety **G1+ G2:** 7.36 ± 1.12

fidelity reported: No **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 5 **G2:** 6 **N at follow-up:** **G1:** NR **G2:** NR	Diagnostic tool/method: ADOS **Diagnostic category, n (%):** Autism PDD-NOS Asperger syndrome **Other characteristics**, n (%)**:** NR	Confidence in child-anxiety **G1+ G2:** 2.82 ± 1.25	Confidence in child-anger **G1+ G2:** 5.45 ± 1.92 Confidence in child-anxiety **G1+ G2:** 5.55 ± 1.81 **Harms:** NR **Modifiers:** NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Strain et al. 2011[76] **Country:** USA **Intervention setting:** Preschool classrooms **Enrollment period:** NR **Funding:** Institute for Educational Sciences, U.S. Department of Education **Design:** RCT	**Intervention:** LEAP (Learning Experiences and Alternative Program for Preschoolers and Their Parents) manuals, videos, and training manuals with training and mentoring relationship with study staff for 2 years (average of 17 hours per week) **Assessments:** Childhood Autism Rating Scale (CARS), Preschool Languge Scale-4th Edition (PLS-4), Social Skills Rating System (SSRS) **Groups:** **G1:** Full replication: Teachers received full LEAP training/coaching **G2:** Teachers provided with intervention manuals and related written materials only **Provider:** Preschool teachers, family members **Treatment manual followed:** Yes **Defined protocol followed:** Yes	**Inclusion criteria:** • classrooms "willing and able" to be LEAP replication sites. • "Able" criteria: • intensity of services provided • enrollment of children with ASD in inclusive settings • minimum ratio of adults to children (1:5) • minimum ratio of typical peers to children with ASD (2:1) **Exclusion criteria:** NR **Age, mean/months ± SD:** **G1:** 50.1 ± 4.6 **G2:** 50.7 ± 4.2 **Mental age, mean/yrs ± SD:** NR **Sex:** NR Race/ethnicity, n (%): NR **SES:** NR **Diagnostic approach:** Based upon school district	**Overall ratings:** **Global Rating of Severity, mean ± SD:** CARS: **G1:** 39.0 ± 6.2 **G2:** 37.4 ± 5.9 **Social skills:** SSRS-positive, mean ± SD: **G1:** 13.5 ± 21.5 **G2:** 20.7 ± 20.2 SSRS-negative, mean ± SD: **G1:** 63.5 ± 15.2 **G2:** 53.4 ± 16.5 **Communication/ language:** PLS-4 (total language), mean ± SD: G1: 32.8 ± 7.5 G2: 34.4 ± 7.2 Mullen (receptive language), mean ± SD: **G1:** 30.8 ± 7.6 **G2:** 33.4 ± 9.0 Mullen (expressive language), mean ± SD: **G1:** 28.9 ± 7.4 **G2:** 30.3 ± 8.2 **Motor skills:** Mullen (fine motor), mean	**Note: all p-values represent G1 delta (change after 2 years of study participation) vs. G2 delta **Overall ratings:** **Global Rating of Severity, mean ± SD:** CARS: **G1:** 32.9 ± 3.9 **G2:** 34.6 ± 4.2 p<0.05 **Social skills:** SSRS-positive, mean ± SD: **G1:** 42.1 ± 12.6 **G2:** 32.7 ± 11.9 p<0.01 SSRS-negative, mean ± SD: **G1:** 56.5 ± 4.2 **G2:** 49.1 ± 4.1 p<0.05 **Communication/ language:** PLS-4 (total language), mean ± SD: **G1:** 51.3 ± 8.1 **G2:** 43.8 ± 7.7 p<0.01 Mullen (receptive language), mean ± SD:

Measure of treatment fidelity reported: Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** Classrooms: **G1:** 28 **G2:** 28 **N at follow-up:** Classrooms: **G1:** 27 **G2:** 23 Teachers: **G1:** 123 **G2:** 107 Children with ASD: **G1:** 177 **G2:** 117	standards for educational diagnoses of ASD **Diagnostic category, n (%):** Autism: 100% PDD-NOS: 0 Aspergers: 0 **Other characteristics**, n (%)**:** Geographic: **G1** schools, n): Metropolitan: 14 Suburban: 10 Rural: 3 G2 schools, n: Metropolitan: 12 Suburban: 8 Rural: 3	± SD: **G1:** 31.9 ± 6.4 **G2:** 34.8 ± 6.2 **General intelligence:** Mullen (visual reception), mean ± SD: **G1:** 32.3 ± 6.6 **G2:** 34.6 ± 7.0 Mullen ELC (early learning composite), mean ± SD: **G1:** 59.6 ± 6.9 **G2:** 63.2 ± 6.6	**G1:** 49.3 ± 7.9 **G2:** 40.7 ± 7.7 p<0.01 Mullen (expressive language), mean ± SD: **G1:** 38.7 ± 6.4 **G2:** 35.9 ± 4.4 p<0.05 **Motor skills:** Mullen (fine motor), mean ± SD: **G1:** 43.3 ± 5.2 **G2:** 39.8 ± 4.9 p<0.05 **General intelligence:** Mullen (visual reception):, mean ± SD **G1:** 52.7 ± 11.5 **G2:** 46.3 ± 11.6 p<0.01 Mullen ELC (early learning composite), mean ± SD: G1: 68.5 ± 7.5 G2: 61.4 ± 9.0 p<0.01 **Harms:** NR **Modifiers:** NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Sung et al. 2011[77] **Country:** SIngapore **Intervention setting:** clinic **Enrollment period:** February 2007 to August 2008 **Funding:** National Medical Research Council grant **Design:** RCT	**Intervention:** Cognitive behavioral therapy (CBT) sixteen 90-minute weekly sessions delivered in small groups of 3-4 participants. Sessions 1-3 focused on recognition and understanding of emotions; Sessions 4-9 focused on anxiety management techniques and sessions 10-16 focused on problem-solving strategies based on the STAR strategy. The social recreational (SR) group received 16 week manualized SR program. 90 minute weekly sessions in groups of 3-4 participants. **Assessments:** observed, parent report, context Spence Child Anxiety Scale- Child (SCAS-C) administered pre and post treatment and at 3 and 6 month follow-up **Groups:** **G1:** cognitive behavioral therapy **G2:** social recreational	**Inclusion criteria:** • 9-16 years old • clinical diagnosis of autism, Asperger syndrome, PDD (NOS) or ASD by DSM-IV criteria • classification of autism or autism spectrum on ADOS • verbal comprehension ≥ 80 and perceptual reasoning skills ≥ 90 on Wechsler Intelligence Scale for Children, 4th edition • no change in medication dosage one month prior to start of study and throughout duration of study **Exclusion criteria:** -see above **Age, mean ± SD yrs:** **G1:** 11.33 ± 2.03 **G2:** 11.09 ± 1.53 **Mental age, mean/yrs (range):** NR **Sex:** M, n (%) **G1:** 34 (94) **G2:** 32 (94)	**SCAS-C, mean ± SD:** Total score **G1:** 29.96 ± 14.91 **G2:** 35.03 ± 14.13 Panic attack **G1:** 4.00 ± 3.42 **G2:** 4.34 ± 3.90 Separation anxiety **G1:** 4.39 ± 2.99 **G2:** 5.28 ± 3.45 Physical injury **G1:** 3.50 ± 2.43 **G2:** 5.03 ± 2.65 Social phobia **G1:** 5.71 ± 3.71 **G2:** 6.31 ± 3.97 Obsessive compulsive **G1:** 6.39 ± 3.73 **G2:** 8.24 ± 3.38 Generalized anxiety **G1:** 5.96 ± 3.55 **G2:** 5.83 ± 3.10	**SCAS-C, mean ± SD:**6 month follow-up Total score **G1:** 21.54 ± 14.82 **G2:** 21.17 ± 11.97 Panic attack **G1:** 2.54 ± 3.53 **G2:** 1.97 ± 2.11 Separation anxiety **G1:** 3.21 ± 3.05 **G2:** 3.10 ± 3.28 Physical injury **G1:** 3.11 ± 2.51 **G2:** 3.28 ± 2.51 Social phobia **G1:** 4.68 ± 3.51 **G2:** 4.55 ± 3.34 Obsessive compulsive **G1:** 4.79 ± 3.65 **G2:** 5.34 ± 3.64 Generalized anxiety **G1:** 3.21 ± 1.95 **G2:** 2.93 ± 2.07 **SCAS-C, n (%)** Deterioated **G1:** 3 (10.34) **G2:** 0 No change **G1:** 13 (44.83)

Provider:
CBT and SR delivered by two trained therapists

Treatment manual followed: Yes

Defined protocol followed: Yes

Measure of treatment fidelity reported:

Co-interventions held stable during treatment:
Yes

Concomitant therapies, n (%):
On medication
G1: 6 (17)
G2: 5 (15)

Not on medication
G1: 29 (81)
G2: 28 (82)

Unknown
G1: 1 (3)
G2: 1 (3)

N at enrollment:
G1: 36
G2: 34

N at follow-up:
G1: 30
G2: 29

ITT analysis
G1: 36

F, n (%)
G1: 2 (6)
G2: 2 (6)

Race/ethnicity, n (%):
Chinese
G1: 35 (97)
G2: 30 (88)

Malay
G1: 1 (3)
G2: 2 (6)

Indian
G1: 0
G2: 1 (3)

Others
G1: 0
G2: 1 (3)

SES: NR

Diagnostic approach:
Referral
Diagnostic tool/method:
DSM-IV, ADOS

Diagnostic category, n (%):
Autism/PDD-NOS
G1: 30 (83)
G2: 28 (82)

Asperger syndrome
G1: 6 (17)
G2: 6 (18)

Other characteristics**, n (%)**:

G2: 13 (44.83)

Improved
G1: 13 (44.83)
G2: 16 (55.17)

Harms: NR

Modifiers: NR

	G2: 34		**Cognitive functioning, mean ± SD:** Verbal Comprehension **G1:** 100.25 ± 13.97 **G2:** 93.06 ± 12.81 Perceptual reasoning **G1:** 108.00 ± 12.26 **G2:** 105.94 ± 11.07	

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Kasari et al. 2010[78] **Country:** US **Intervention setting:** Laboratory **Enrollment period:** 01/2002 to 09/2005 **Funding:** Grant NIMH **Design:** RCT	**Intervention:** Joint attention intervention. !0 modules completed in 24 sessions (3 per week) for 8 weeks **Assessments:** 15 minute videotaped caregiver-child interaction observed at end of intervention (8 weeks) and 12 months later (14 month from study start) Mullen scales at baseline and at 12 month follow-up **Groups:** **G1:** Immediate treatment **G2:** Wait list **Provider:** Trained interventionists (graduate students in educational psychology experienced with children with autism. Videotapes coded by blinded reviewer **Treatment manual followed:** NR **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes	**Inclusion criteria:** • age < 36 months • met DSM-IV criteria for autism by independent clinician • no additional syndromes **Exclusion criteria:** • see above **Age, mean/mos ± SD**: **G1:** 30.35 ± 0.93 **G2:** 31.31 ± 0.90 **Mental age, mean/mos ± SD Mullen scales:** **G1:** 19.83 ± 1.80 **G2:** 18.57 ± 1.09 **Sex:** M, n (%): **G1:** 15 (79) **G2:** 14 (74) F, n (%): **G1:** 4 (21) **G2:** 5 (26) **Race/ethnicity, n (%):** White **G1:** 10 (53) **G2:** 12 (63) Minority **G1:** 9 (47) **G2:** 7 (37)	Object and joint engagement, mean ± SD Unengaged/other engagement **G1:** 20.80 ± 19.03 **G2:** 19.52 ± 14.95 Object engagement **G1:** 48.58 ± 21.87 **G2:** 54.97 ± 17.43 Joint engagement **G1:** 30.26 ± 14.91 **G2:** 24.98 ± 10.74 Frequency of joint attention initiations **G1:** 3.0 ± 2.77 **G2:** 3.62 ± 5.92 Frequency of joint attention responses **G1:** 0.42 ± 0.69 **G2:** 0.63 ± 0.23 Type of functional play acts **G1:** 3.00 ± 2.38 **G2:** 4.42 ± 3.17 Type of symbolic play acts **G1:** 0.11 ± 0.46 **G2:** 0.42 ± 0.84	Object and joint engagement, mean ± SD 8 weeks post treatment Unengaged/other engagement **G1:** 22.01 ± 18.24 **G2:** 17.31 ± 10.17 Object engagement **G1:** 34.75 ± 18.39 **G2:** 54.69 ± 18.15 Joint engagement **G1:** 42.85 ± 19.96 **G2:** 27.87 ± 14.01 Frequency of joint attention initiations **G1:** 3.11 ± 3.41 **G2:** 3.77 ± 3.76 Frequency of joint attention responses **G1:** 0.79 ± 0.23 **G2:** 0.05 ± 0.23 Type of functional play acts **G1:** 5.29 ± 2.37 **G2:** 3.29 ± 2.30 Type of symbolic play acts **G1:** 0.26 ± 0.65 **G2:** 0.53 ± 1.43 Object and joint

Co-interventions held stable during treatment: NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 19 **G2:** 19 **N at follow-up:** **G1:** 19 **G2:** 16	**SES:** Caregiver's highest level education, n (%): Some college/vocational training **G1:** 3 (16) **G2:** 2 (11) College **G1:** 12 (63) **G2:** 11 (58) Professional/graduate **G1:** 4 (21) **G2:** 6 (31) Caregiver's employment status, n (%): Not employed **G1:** 14 (74) **G2:** 12 (63) Employed part or full time **G1:** 5 (26) **G2:** 7 (37) **Diagnostic approach:** In Study/Referral Diagnostic tool/method: DSM-IV confirmed by ADI-R **Diagnostic category, n (%):** NR **Other characteristics, n (%):** Mullen scales Developmental quotient, mean ± SD:	engagement, mean ± SD Follow-up IT group only Unengaged/other engagement **G1:** 15.87 ± 13.55 Object engagement **G1:** 28.35 ± 15.87 Joint engagement **G1:** 52.27 ± 20.56 Frequency of joint attention initiations **G1:** 4.44 ± 5.61 Frequency of joint attention responses **G1:** 0.61 ± 0.70 Type of functional play acts **G1:** 8.44 ± 4.77 Type of symbolic play acts **G1:** 1.11 ± 2.37 **Harms:** NR **Modifiers:** NR

G1: 64.80 ± 5.35
G2: 59.81 ± 3.14

Birth order, n (%)
Only child
G1: 10 (53)
G2: 7 (36)

First born
G1: 7 (36)
G2: 5 (26)

Second born
G1: 2 (11)
G2: 2 (11)

Twin
G1: 0
G2: 2 (11)

Missing
G1: 0
G2: 3 (16)

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Keen et al. 2010[79] **Country:** Australia **Intervention setting:** clinic/home **Enrollment period:** NR **Funding:** NR **Design:** Prospective cohort	**Intervention:** Parent-focused intervention- professional supported- two day parent group workshop and series of 10 home-based consultations with facilitator. Workshop provided information and parent education on the following topics: autism, social, communication, play, sensory, behavior, strategies to improve social interaction and communication, embedding strategies within daily routines, using a balanced approach, and selecting a child-focused early intervention program. Comparator: self-directed parent intervention group received an interactive instructional DVD "Being Responsive: You and Your Child with Autism" Intervention lasted for 6 weeks. Follow-up assessments conducted 3 months after completion of intervention **Assessments:** Scales of	**Inclusion criteria:** • families with child aged 2-4 with clinical diagnosis of ASD received within 6 months of study entry • not receiving more than 20 hours/week of services for child • not enrolled in an intensive behavior intervention **Exclusion criteria:** NR **Age, mean/yrs (range):** **G1:** 36.38 ± 7.54 **G2:** 35.71 ± 6.92 **Mental age, mean/yrs (range):** Mullen score (DQ) mean ± SD **G1:** 53.06 ± 9.06 **G2:** 52.86 ± 6.53 **Sex:** M, n (%): **G1:** 15 (88.2) **G2:** 16 (72.7) **Race/ethnicity, n (%):** NR **SES:** Maternal education, n (%):	PSI Mother, mean ± SD Child **G1:** 147 ± 23.3 (n=17) **G2:** 146 ± 18.6 (n=22) Parent **G1:** 141 ± 21.2 **G2:** 146 ± 18.0 PSI Father, mean ± SD Child **G1:** 140 ± 23.2 (n=16) **G2:** 145 ± 17.8 (n=21) Parent **G1:** 141 ± 29.2 **G2:** 137 ± 21.6 PSOC Mother, mean ± SD Satisfaction **G1:** 33.6 ± 5.27 (n=17) **G2:** 32.8 ± 7.22 (n=22) Efficacy **G1:** 24.8 ± 4.70 **G2:** 27.0 ± 5.86 PSOC Father, mean ± SD Satisfaction **G1:** 34.4 ± 4.89 (n=17) **G2:** 36.1 ± 6.58 (n=21) Efficacy **G1:** 24.8 ± 4.23 **G2:** 25.4 ± 4.98	PSI Mother, mean ± SD Child **G1:** 132 ± 21.3 (n=17) **G2:** 141 ± 19.1 (n=21) Parent **G1:** 133 ± 23.9 **G2:** 143 ± 16.7 PSI Father, mean ± SD Child **G1:** 137 ± 21.8 (n=16) **G2:** 145 ± 17.8 (n=17) Parent **G1:** 141 ± 20.6 **G2:** 138 ± 15.4 PSOC Mother, mean ± SD Satisfaction **G1:** 37.5 ± 5.82 (n=16) **G2:** 34.5 ± 7.53 (n=21) Efficacy **G1:** 29.6 ± 4.32 **G2:** 28.8 ± 5.21 PSOC Father, mean ± SD Satisfaction **G1:** 35.9 ± 6.10 (n=15) **G2:** 36.9 ± 5.61 (n=18) Efficacy **G1:** 29.1 ± 3.33 **G2:** 28.4 ± 4.97

independent behavior revised- early development form (SIB-R), communication and symbolic behavior scales developmental profile (CBS-DP), Mullen scales of early learning, parenting stress index (PSI), Parenting sense of competence (PSOC) **Groups:** **G1:**Professional parent intervention **G2:** Self-directed parent intervention **Provider:** Facilitator (doctoral students experienced in working with families of young children with ASD) conducted home-based consultations **Treatment manual followed:** NR **Defined protocol followed:** NR **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR	High school (9-12 grade) **G1:** 6 (35.3) **G2:** 2 (9.1) Vocational **G1:** 4 (23.5) **G2:** 5 (22.7) College graduate **G1:** 0 **G2:** 5 (22.7) University graduate **G1:** 7 (41.2) **G2:** 10 (45.5) Paternal education, n (%): High school (9-12 grade) **G1:** 6 (35.3) **G2:** 5 (22.7) Vocational **G1:** 1 (5.9) **G2:** 6 (27.3) College graduate **G1:** 0 **G2:** 2 (9.1) University graduate **G1:** 10 (58.8) **G2:** 9 (40.9) Household income, mean (range): NR **Diagnostic approach:** Referral Diagnostic tool/method: DSM-IV. Diagnosis	**Harms:** NR **Modifiers** Fathers reported higher levels of stress than mothers in both groups.

		confirmed by ADOS
N at enrollment: **G1:** 17 families (17 mothers/16 fathers) **G2:** 22 families (22 mothers/21 fathers)		administered by research team. **Diagnostic category, n (%):** Autistic disorder 30(77) Autism spectrum disorder 9 (23)
N at follow-up: **G1:** NR **G2:** NR		**Other characteristics**, n (%)**:** SIB-R standard score, mean ± SD **G1:** 52.29 ± 23.14 **G2:** 43.18 ± 20.57 CSBS-DP behavior sample mean ± SD **G1:** 56.36 ± 31.84 **G2:** 55.57 ± 38.24 Social (raw scores) **G1:** 27.34 ± 10.91 **G2:** 25.07 ± 12.10 Speech (raw scores) **G1:** 17.56 ± 14.78 **G2:** 15.95 ±16.51 Symbolic (raw scores) **G1:** 11.47 ± 10.04 **G2:** 14.55 ± 12.55

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Koenig et al. 2010[80] **Country:** US **Intervention setting:** clinic **Enrollment period:** NR **Funding:** Organization for Autism Research, Beatrice-Renfield-Yale School of Nursing clinical Initatives fund, Research Units on Pediatric Psychopharmacology, NIMH **Design:** RTC	**Intervention:** Social skills intervention, once weekly 75 minute group intervention 75 minutes for 16 weeks. Groups had 4-5 participants plus 2 peer tutors, led by two licensed clinicians **Assessments:** Characterization of subjects: Social Communication Questionnaire (SCQ), ADOS, PDD-BI. Outcomes: Clinical Global Impressions Scale (CGI) – improvement item, Social Competency Inventory, Parent Satisfaction survey **Groups:** **G1:** intervention **G2:** control/other intervention **Provider:** Licensed clinicians (included one advanced practice RN, two social workers, four clinical psychologists) **Treatment manual followed:** Yes	**Inclusion criteria:** • age 8-11 years • full scale IQ score ≥ 70 • clinical diagnosis of PDD • met criteria for PDD on ADOS, SCQ, and Pervasive Developmental Disorders Behavior Inventory **Exclusion criteria:** • participants were screened for psychiatric problems-severe aggression, self-injury or oppositional behavior • score > 18 on irritability scale of ABC • score in clinically significant range on any CSI scale **Age, mean/yrs ± SD:** **G1:** 9.2 ± 1.2 **G2:** 9.3 ± 1.2 **Mental age, mean/yrs (range):** NR **Sex:** M, 34 (77%): F, 10 (23%):	**SCI pro social index, mean ± SD:** **G1:** 2.52 ± 0.48 **G2:** 2.67 ± 0.64 **SCI social initation index, mean ± SD:** **G1:** 2.52 ± 0.90 **G2:** 2.60 ± 0.64	**Social skills:** **SCI pro social index, mean ± SD:** **G1:** 2.83 ± 0.53 **G2:** 2.77 ± 0.56 **SCI social initation index, mean ± SD:** **G1:** 2.98 ± 0.71 **G2:** 3.00 ± 0.46 **Harms:** NR **Modifiers:** NR

	Race/ethnicity, n (%):
Defined protocol followed: NR	White **G1+G2:** 98%
	African American
Measure of treatment fidelity reported: Yes	**G1+G2:** 2%
	SES:
Co-interventions held stable during treatment: NR	Maternal education, n (%): NR
	Household income, mean (range): NR
Concomitant therapies, n (%): NR	
	Diagnostic approach:
N at enrollment: **G1:** 25 **G2:** 19	In Study/Referral
	Diagnostic tool/method:
N at follow-up: **G1:** 23 **G2:** 18	**Diagnostic category, n (%):** Autism **G1:** 7 **G2:** 3
	PDD-NOS **G1:** 11 **G2:** 12
	AD **G1:** 6 **G2:** 3
	Other characteristics, n (%): CGI severity score, mean ± SD: **G1:** 3.67 ± 0.56 **G2:** 3.78 ± 0.55
	FSIQ score, mean ± SD: **G1:** 96.4 ± 20.5

	G2: 95.9 ± 17.3 SCQ score, mean ± SD: **G1:** 17.8 ± 7.1 **G2:** 19.6 ± 6.6 ADOS Com total, mean ± SD: **G1:** 4.5 ± 1.6 **G2:** 4.1 ± 2.1 ADOS Soc total, mean ± SD: **G1:** 7.1 ± 4.0 **G2:** 6.8 ± 3.7 ADOS Soc. And Com algorithm total, mean ± SD: **G1:** 12.0.2 ± 5.2 **G2:** 10.9 ± 5.3

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Kouijzer et al., 2010 [81] **Country:** Netherlands **Intervention setting:** NR **Enrollment period:** NR **Funding:** NR **Design:** RCT	**Intervention:** 40 neurofeedback sessions comprising seven 3-min intervals of active neurofeedback training separated by 1-min rest intervals; during active training, criterion line placement adapted to participant ability to be rewarded 50-80% of the time; sessions conducted twice weekly **Assessments:** parent and teacher report, testing by researchers Timing: at baseline, end of Treatment and again 6 months after Treatment **Groups:** **G1:** neurofeedback **G2:** control **Provider:** Researchers **Treatment manual followed:** No **Defined protocol followed:** No **Measure of treatment fidelity reported:** No	**Inclusion criteria:** • age 8-12 years • IQ score $\geq$ 80 • presence of autistic disorder, Asperger disorder, or PDD-NOS **Exclusion criteria:** • use of medication • history of severe brain injury • co-morbidity (e.g. ADHD, epilepsy) **Age, mean/yrs ± SD:** **G1:** 9.43 ± 1.44 **G2:** 9.14 ± 1.34 **Mental age, mean/yrs (range):** NR **Sex:** M, n (%): **G1:** 9 (90) **G2:** 8 (80) F, n (%): **G1:** 1 (10) **G2:** 2 (20) **Race/ethnicity, n (%):** NR **SES:** NR	**Parent Report:** **Social skills:** SCQ total: **G1:** 14.20 ± 6.56 **G2:** 16.67 ± 3.96 SRS total: **G1:** 79.60 ± 35.90 **G2:** 89.11 ± 19.47 CCC-2 total: **G1:** 106.20 ± 16.01 **G2:** 104.22 ± 15.96 Social awareness: **G1:** 11.80 ± 5.02 **G2:** 12.77 ± 2.81 Social cognition: **G1:** 14.00 ± 7.27 **G2:** 17.55 ± 3.60 Social motivation: **G1:** 15.00 ± 7.48 **G2:** 14.55 ± 5.43 Social relations: **G1:** 13.50 ± 3.34 **G2:** 15.33 ± 1.41 Interests: **G1:** 13.00 ± 1.94 **G2:** 14.56 ± 1.66 Reciprocal social interactions: **G1:** 4.10 ± 2.46	**Parent report (end of Treatment):** **Social skills:** SCQ total: **G1:** 5.80 ± 4.16 **G2:** 15.56 ± 5.79 p=0.006 SRS total: **G1:** 52.50 ± 33.07 **G2:** 88.22 ± 41.13 p=NS CCC-2 total: **G1:** 86.80 ± 23.47 **G2:** 106.11 ± 17.98 p=0.021 Social awareness: **G1:** 8.90 ± 4.0 **G2:** 12.11 ± 5.44 p=NS Social cognition: **G1:** 8.80 ± 4.89 **G2:** 18.44 ± 8.11 p=NS Social motivation: **G1:** 10.20 ± 8.68 **G2:** 14.66 ± 7.15 p=NS Social relations: **G1:** 12.90 ± 3.31 **G2:** 14.22 ± 3.49 p=NS

Co-interventions held stable during treatment: NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 10 **G2:** 10 **N at follow-up:** **G1:** 10 **G2:** 10 **N at 12 month follow-up (G1 only):** **G1:** NR	**Diagnostic approach:** Referral Diagnostic tool/method: Met criteria for DSM-IV diagnosis of autistic disorder, Asperger disorder, or PDD-NOS **Diagnostic category, n (%):** Autism **G1:** 6 (60) **G2:** 2 (20) PDD-NOS **G1:** 4 (40) **G2:** 4 (40) Aspergers **G1:** 0 (0) **G2:** 4 (40) **Other characteristics, n (%):** SCQ total, mean ± SD: **G1:** 14.2 ± 6.56 **G2:** 16.67 ± 3.97	**G2:** 3.78 ± 2.22 **Communication/ language:** Communication (SRS): **G1:** 25.80 ± 11.97 **G2:** 27.77 ± 8.34 Speech production: **G1:** 12.60 ± 3.89 **G2:** 10.89 ± 3.78 Syntax: **G1:** 12.70 ± 2.66 **G2:** 12.11 ± 3.37 Sematics: **G1:** 13.10 ± 1.66 **G2:** 11.33 ± 2.78 Coherence: **G1:** 13.70 ± 3.02 **G2:** 12.00 ± 4.24 Inappropriate initialization: **G1:** 12.70 ± 3.33 **G2:** 14.11 ± 1.36 Stereotyped conversation: **G1:** 13.20 ± 3.64 **G2:** 14.00 ± 2.44 Context use: **G1:** 13.70 ± 3.62 **G2:** 15.44 ± 1.67 Non-verbal communication: **G1:** 14.50 ± 1.95 **G2:** 14.33 ± 2.59 Pragmatics: **G1:** 54.10 ± 10.07	Interests: **G1:** 10.50 ± 3.10 **G2:** 13.89 ± 2.36 p=NS Reciprocal social interactions: **G1:** 1.90 ± 1.44 **G2:** 5.33 ± 2.64 P<0.05 Communication (SRS): **G1:** 17.00 ± 12.02 **G2:** 27.77 ± 14.37 p=NS Speech production: **G1:** 9.20 ± 2.82 **G2:** 10.56 ± 3.97 p=NS Syntax: **G1:** 10.70 ± 3.74 **G2:** 12.56 ± 2.74 p=NS Sematics: **G1:** 9.70 ± 3.46 **G2:** 12.33 ± 2.00 p=0.01 Coherence: **G1:** 11.20 ± 3.55 **G2:** 13.67 ± 3.39 p=0.004 Inappropriate initialization: **G1:** 10.00 ± 3.46 **G2:** 13.67 ± 3.04

	G2: 57.89 ± 6.13	p=0.042
	Communication (SCQ): **G1:** 5.90 ± 2.92 **G2:** 6.11 ± 1.83	Stereotyped conversation: **G1:** 11.20 ± 3.76 **G2:** 13.33 ± 3.57 p=NS
	Repetitive behavior: Autistic mannerisms: **G1:** 13.00 ± 7.31 **G2:** 16.44 ± 5.17	Context use: **G1:** 12.00 ± 4.24 **G2:** 15.56 ± 2.29 p=NS
	Restricted, repetitive, and stereotyped behavior: **G1:** 3.50 ± 2.63 **G2:** 5.89 ± 1.16	Non-verbal communication: **G1:** 11.80 ± 3.15 **G2:** 14.67 ± 1.93 p=0.022
	Educational/ cognitive/ academic attainment: Auditory selective attention: **G1:** 54.30 ± 25.72 **G2:** 42.66 ± 23.01	Pragmatics: **G1:** 45.00 ± 13.44 **G2:** 60.56 ± 16.68 p=NS
	Inhibition of verbal responses: **G1:** 97.00 ± 57.33 **G2:** 71.10 ± 38.00	Communication (SCQ): **G1:** 2.50 ± 2.12 **G2:** 5.22 ± 2.43 p=0.037
	Inhibition of motor responses: **G1:** 86.48 ± 12.87 **G2:** 84.05 ± 12.43	**Repetitive behavior:** Autistic mannerisms: **G1:** 7.60 ± 6.36 **G2:** 16.33 ± 10.25 p=NS
	Cognitive flexibility, set shifting: **G1:** 31.20 ± 43.12 **G2:** 21.30 ± 22.652	Restricted, repetitive, and stereotyped behavior: **G1:** 1.20 ± 1.31 **G2:** 4.56 ± 2.96 p=NS
	Cognitive flexibility, concept generation: **G1:** 3.36 ± 1.52	

	G2: 3.09 ± 1.32 Goal setting: **G1:** 71.09 ± 15.54 **G2:** 59.00 ± 14.51 Speed and efficiency: **G1:** 1.14 ± 0.10 **G2:** 1.05 ± 0.17	**Educational/ cognitive/ academic attainment:** Auditory selective attention: **G1:** 58.09 ± 31.08 **G2:** 55.84 ± 20.98 p=NS Inhibition of verbal responses: **G1:** 43.50 ±21.69 **G2:** 43.50 ± 22.98 p=NS Inhibition of motor responses: **G1:** 91.56 ± 9.78 **G2:** 88.68 ± 12.25 p=NS Cognitive flexibility, set-shifting: **G1:** 13.40 ± 16.74 **G2:** 35.20 ± 26.35 p=0.045 Cognitive flexibility, concept generation: **G1:** 5.55 ± 0.69 **G2:** 4.41 ± 0.81 p=NS Goal setting: **G1:** 78.41 ± 13.70 **G2:** 62.97 ± 10.73 p=NS Speed and efficiency: **G1:** 1.06 ± 0.13 **G2:** 1.00 ± 0.16

		p=NS All p-values represent time x group interactions **Harms:** NR **Modifiers:** NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Lopata et al. 2010[82] **Country:** US **Intervention setting:** college campus **Enrollment period:** NR **Funding:** NR **Design:** RCT	**Intervention:** Manualized social treatment program conducted over 5 weeks with five treatment cycles per day, 70 minutes each (20 min of intensive instruction and 50 minute therapeutic activity). Instruction and therapeutic activities targeting social skills, face-emotion recognition, interest expansion, and interpretation of non-literal language. **Assessments:** Adapted Skillstreaming Checklist (ASC), Social Responsiveness Scale (SRS), Skillstreaming Knowledge Assessment (SKA), Diagnositc Analysis of Nonverbal Accuracy2 (DANVA2), Parent, Child and Staff satisfaction surveys, Comprehensive Assessment of Spoken Language (CASL), Wechsler Intelligence Scale for Children, 4th edition (WISC-IV) **Groups:** **G1:** Skillstreaming	**Inclusion criteria:** • written diagnosis of HFASD • WISC-IV short form IQ > 70, WISC-IV Verbal Comprehension index (VCI) or Perceptual Reasoning Index (PR) ≥ 80 • expressive or receptive language score ≥ 80 on short form of the Comprehensive Assessment of Spoken Language (CASL) **Exclusion criteria:** • severe physical aggression **Age, mean/yrs ± SD:** **G1:** 9.39 ± 1.72 **G2:** 9.56 ± 1.54 **Mental age, mean/yrs (range):** NR **Sex:** M, n (%): **G1:** 17 (94.4) **G2:** 17 (94.4) F, n (%): **G1:** 1 (5.6) **G2:** 1 (5.6)	**Parent ratings** ASC Total score, mean ± SD: **G1:** 109.67 ± 15.76 **G2:** 101.78 ± 20.47 SRS Total score, mean ± SD: **G1:** 79.94 ± 11.02 **G2:** 81.12 ± 13.78 Withdrawal, mean ± SD: **G1:** 68.78 ± 12.14 **G2:** 74.68 ± 12.48 Social Skills, mean ± SD: **G1:** 39.22 ± 9.10 **G2:** 34.22 ± 7.84 **Direct child measures ratings** SKA Total score, mean ± SD: **G1:** 46.39 ± 17.72 **G2:** 48.64 ± 12.08 DANVA-2 Child faces score, mean ± SD: **G1:** 88.97 ± 22.45 **G2:** 91.44 ± 15.96 CASL Idioms, mean ± SD: **G1:** 8.89 ± 6.82 **G2:** 11.44 ± 7.97	**Parent ratings** ASC Total score, mean ± SD: **G1:** 119.67 ± 17.13 **G2:** 103.72 ± 17.23 SRS Total score, mean ± SD: **G1:** 73.67 ± 11.42 **G2:** 82.53 ± 13.77 Withdrawal, mean ± SD: **G1:** 63.39 ± 8.76 **G2:** 76.83 ± 10.38 Social Skills, mean ± SD: **G1:** 41.39 ± 7.27 **G2:** 35.11 ± 7.65 **Direct child measures ratings** SKA Total score, mean ± SD: **G1:** 58.83 ± 11.50 **G2:** 43.31 ± 13.86 DANVA-2 Child faces score, mean ± SD: **G1:** 99.03 ± 11.44 **G2:** 91.86 ± 19.38 CASL Idioms, mean ± SD: **G1:** 12.94 ± 7.26 **G2:** 12.50 ± 9.34 **Harms:** NR

intervention **G2:** waitlist **Provider:** Graduate and undergraduate students from psychology and education **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Co-interventions held stable during treatment:** Yes **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 18 **G2:** 18 **N at follow-up:** **G1:** 18 **G2:** 18	**Race/ethnicity, n (%):** White **G1:** 16 (88.9) **G2:** 16 (88.9) African-American **G1:** 1 (5.6) **G2:** 1 (5.6) Other **G1:** 1 (5.6) **G2:** 1 (5.6) **SES:** Parent education, years mean ± SD: **G1:** 14.78 ± 2.50 **G2:** 15.58 ± 2.08 Household income, mean (range): NR **Diagnostic approach:** In Study/Referral Diagnostic tool/method: NR **Diagnostic category, n (%):** Asperger's **G1:** 15 (83.3) **G2:** 13 (72.2) PDD **G1:** 2 (11.1) **G2:** 5 (27.8) HFA **G1:** 1 (5.6) **G2:** 0 **Other characteristics**, n	**Modifiers:** NR

	(%)**:** WISC-IV short form IQ, mean ± SD **G1:** 101.63 ± 13.75 **G2:** 104.45 ± 15.46 CASL4 Expressive language **G1:** 101.11 ± 13.57 **G2:** 104.78 ± 17.59 CASL4 Receptive language **G1:** 106.17 ± 11.96 **G2:** 107.83 ± 16.92	

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: McConkey et al. 2010[83] **Country:** Northern Ireland **Intervention setting:** Home **Enrollment period:** NR **Funding:** Grants to Autism NI from the Department of Health, Social Services and Public Safety and by special project funding from the Southern Health and Social Services Board **Design:** Prospective cohort	**Intervention:** Early intervention program (known as Keyhole), based mainly around TEACCH, Picture Exchange Communication System (PECS) and Hanen approaches; Delivered to families through 15–18 home visits over a nine-month period in 2 separate geographical areas **Assessments:** Psycho-Educational Profile – Revised (PEP-R) Gilliam Autism Rating Scale, Vineland Adaptive Behavior Scales, The General Health Questionnaire (GHQ). Independent personnel who had not been involved in delivering the intervention collected the post-intervention data **Groups:** **G1:** Early intervention program **G2:** contrast **Provider:** Early	**Inclusion criteria:** • confirmed diagnosis of ASD from a specialist clinic that served the geographical area in which the project was located. • not older than four years of age and should not be attending nursery school (attendance at a playgroup was permitted) • not in receipt of Speech and Language Therapy services provided by the Health and Social Care (HSC) Trusts in which the project was located • families had to consent to taking part in both the intervention and its evaluation, and to being interviewed at home by a university researcher **Exclusion criteria:** see inclusion criteria **Age, mean/yrs :** **G1:** 2.8 years	**PEP-R, mean (SD):** **G1:** Imitation: 4.9 ± 4.7 Perception: 7.9 ± 3.3 Fine-motor: 7.07 ± 3.5 Gross-motor: 10.8 ± 3.4 Eye–hand: 4.2 ± 2.7 Cognitive – non-verbal: 5.2 ± 4.6 Cognitive – verbal : 2.8 ± 3.7 Developmental age: mean ± sd G1: 20.1 ± 7.4 **Behavior:** % children with problems reported to be 'getting better' in each group: Problems with language **G1:** 2.8 **G2:** 32.1 Problems with play **G1:** 2.8 **G2:** 17.9 Relating to other people **G1:** 8.3 **G2:** 21.4 Unusual interest in toys/objects **G1:** 5.6 **G2:** 3.7	**PEP-R, mean (SD):** **G1:** Imitation: 8.8 ± 5.0 Perception: 10.4 ± 3.1 Fine-motor: 10.5 ± 3.8 Gross-motor: 15.0 ± 3.5 Eye–hand: 7.0 ± 3.1 Cognitive – non-verbal: 12.2 ± 6.4 Cognitive – verbal: 7.57 ± 5.8 Developmental age: mean ± sd G1: 29.7 ± 11.2 Significant improvement in all subscales at p<0.001 **Behavior:** % children with problems reported to be 'getting better' in each group; p-values are within-group change comparisons over time: Problems with language **G1:** 60 (p< .001) **G2:** 41.7 (NS) Problems with play **G1:** 54.3 (p<.001) **G2:** 37.5 (p<.005) Relating to other people **G1:** 25.7 (p<.005)

intervention therapists (speech and language therapists with an interest in ASD) **Treatment manual followed:** NR **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** NR **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 36 **G2:** 26 **N at follow-up:** **G1:** 35 **G2:** 26	**G2:** 3.4 years **Mental age, mean/yrs (SD):** NR **Sex, n (%):** M: 55 (90%) F: 6 (10%). **Race/ethnicity, n (%):** % minority status: **SES:** 44 families (73%) owned their own homes with 7 (13%) renting and 4 (7%) living with their parents. **Maternal education, n (%**): completed third level: 22 (37%) taken GCSEs: 28 (47%) Left school: 7 (12%) **Household income:** There was a wage-earner in 36 (64%) of families but not in 20 (36.0%). Diagnostic approach: In Study Diagnostic tool/method: diagnosis at a specialist clinic **Diagnostic category, n (%):** Autism : 61 (100%) **Other characteristics, n**	Difficulty in imitating **G1:** 2.8 **G2:** 25 Adaptation to change **G1:** 5.6 **G2:** 17.9 **Vineland scores, Mean (SD):** Vineland – communication **G1:** 61.5 ± 8.2 **G2:** 62.6 ± 11.9 Vineland – socialization **G1:** 63.7 ± 8.8 **G2:** 64.2 ± 8.5 Vineland – daily living **G1:** 65.9 ± 8.9 **G2:** 68.5 ± 14.8 Vineland – motor skills **G1:** 75.7 ± 16.4 **G2:** 77.0 ± 16.6 Vineland – adaptive behaviour **G1:** 61.3 ± 8.5 **G2:** 62.3 ± 9.6 **Mean (SD):** GARS – autism quotient **G1:** 85.4 ± 15.3 **G2:** 88.6 ± 10.9 GARS – percentile scores **G1:** 24.9 ± 25.2 **G2:** 27.1 ± 18.1	**G2:** 29.2 (NS) Unusual interest in toys/objects **G1:** 22.9 (NS) **G2:** 16.7 (NS) Difficulty in imitating **G1:** 22.9 (p<.005) **G2:** 29.2 (NS) Adaptation to change **G1:** 45.7 (NS) **G2:** 25 (NS) **Vineland scores, Mean (SD):** Vineland – communication **G1:** 69.5 ± 16.2 **G2:** 60.7 ± 12.3 Vineland – socialization **G1:** 75.9 ± 20.6 **G2:** 69.5 ± 13.1 Vineland – daily living **G1:** 71.2 ± 15.5 **G2:** 66.1 ± 15.3 Vineland – motor skills **G1:** 78.1 ± 20.1 **G2:** 72.9 ± 18.5 Vineland – adaptive behavior **G1:**67.7 ± 11.8 **G2:**61.7 ± 11.8 **Mean (SD):** GARS – autism quotient

	(%): Sensory impairment: 8 (13); Epilepsy 8 (13%) Physical impairment 1 (2%)	**Mean (SD):** GHQ – overall score **G1:** 7.2 ± 4.4 **G2:** 5.7 ± 4.4 GHQ – somatic **G1:** 2.8 ± 1.4 **G2:** 1.7 ± 1.7 GHQ – anxiety **G1:** 2.7 ± 2.1 **G2:** 2.3 ± 2.2 QRS total score **G1:** 8.7 ± 7.6 **G2:** 16.6 ± 6.2	**G1:** 89.2 ± 13.2 **G2:** 99.4 ± 20.4 GARS – percentile scores **G1:** 29.7 ± 25.2 **G2:** 48.1 ± 31.4 **Mean (SD):** GHQ – overall score **G1:** 1.6 ± 2.3 **G2:** 5.3 ± 6.0 GHQ – somatic **G1:** .5 ± .8 **G2:** 1.8 ± 2.4 GHQ – anxiety **G1:** .9 ± 1.8 **G2:** 2.4 ± 2.4 QRS total score **G1:** 14.3 ± 6.5 **G2:** 16.0 ± 7.6 **Harms** NR **Modifiers:** NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Oosterling et al. 2010[84] **Country:** Netherlands **Intervention setting:** Clinic/home **Enrollment period:** Spring/2004-spring/2007 **Funding:** Grant from Korczak Foundation and European Union **Design:** RCT	**Intervention:** 'Parent Focus Training:' Two-year home-based parent training program, focused on stimulating joint attention and language skills. Started with 4 weekly 2-hour group sessions with parents, followed by individual home visits every 6 weeks during first year. Home visits were at three month intervals in second year **Assessments:** Dutch version of MacArthur Communicative Development Inventory (NCD-I), Child Behavior Checklist 1 ½-5, Symptom Checklist-90, Nijmeegse Ouderlijk Stress Index, Infant Characteristics Questionnaire, Clinical Global Impression-Improvement Scale, Erickson scales, Autism Diagnostc Observation Schedule, Autism Diagnostic Interview-Revised, Mullen Scales of Early Learning, Psycho Educational Profile – Revised,	**Inclusion criteria[a]:** • age 12-42 months • clinical diagnosis of autism and developmental age at least 12 months • clinical diagnosis of PDD-NOS and developmental age at least 12 months and Developmental Quotient < 80 **Exclusion criteria:** • substantial other problems in family (severe parental psychopathology, financial/housing problems, marital conflicts) • insufficient parental proficiency in Dutch **Age, mean/months ± SD:** **G1:** 35.2 ± 5.5 **G2:** 33.3 ± 6.4 **Mental age, mean/yrs (range):**NR **Sex: Male %** **G1:** 75 **G2:** 80.6 **Race/ethnicity, n (%):** NR	DQ, mean ± SD **G1:** 58.4 ± 16.8 **G2:** 58.0 ± 16.9 ADOS, mean ± SD SA **G1:** 15.0 ± 4.6 **G2:** 14.8 ± 4.9 RRB **G1:** 2.8 ± 1.7 **G2:** 2.8 ± 1.9 ADI-R RSI: **G1:** 16.3 (5.1) **G2:** 14.7 (4.5) Communication: **G1:** 11.2 (2.4) **G2:** 10.3 (2.8) RRSPB: **G1:** 4.1 (2.1) **G2:** 3.0 (1.8) MacArthur N-CDI Words understood **G1:** 177.9 ± 122.5 **G2:** 181.5 ± 121.4 Words said **G1:** 106.8 ± 122.2 **G2:** 101.7 ± 109.7 Gestures produced **G1:** 29.1 ± 13.7	ADOS, change Level of non-echoed language on 6 point scale **G1:** -1.6 ± 1.1 **G2:** -1.3 ± 1.2 $p < 0.001$ Joint attention factor **G1:** -0.8 ± 2.3 **G2:** -0.9 ± 0.2 Social affect **G1:** -2.5 ± 4.0 **G2:** -2.3 ± 3.7 $p < 0.05$ **Social skills: Communication/ language, mean change ± SD:** MacArthur N-CDI Words understood **G1:** 62.0 ± 75.0 **G2:** 35.2 ± 66.1 $p < 0.01$ Words said **G1:** 75.5 ± 78.8 **G2:** 56.1 ± 97.2 $p < 0.05$ Gestures produced **G1:** 6.7 ± 10.2 **G2:** 6.3 ± 9.0 $p < 0.01$

Groups:
G1: nonintensive parent training + care as usual
G2: care as usual (special nursery with music, speech, play, and motor therapy)

Provider:
Psychologists or sociotherapists worked as parent-trainers

Treatment manual followed: NR

Defined protocol followed: Yes

Measure of treatment fidelity reported: Yes

Co-interventions held stable during treatment:
Concomitant therapies, n (%):
Care as usual, mean ± SD
Day care, average number of daily periods in child special day care of medical nursery
G1: 5.2 ± 1.7
G2: 4.2 ± 2.9

Speech and language therapy, minutes per week
G1: 16.7 ± 22.4
G2: 19.1 ± 22.0

SES:
Maternal education, %:
Low
G1: 41.7
G2: 41.9

Middle
G1: 33.3
G2: 35.5

High
G1: 25.0
G2: 22.6

Paternal education, %:
Low
G1: 34.3
G2: 56.7
Middle
G1: 20.0
G2: 26.7

High
G1: 45.7
G2: 16.7

Household income, mean (range): NR

Diagnostic approach:
Referral based on screening positive on the Early Screening of Autistic Traits Questionnaire

Diagnostic tool/method:
Consensus diagnosis of two professionals, ADOS, ADI-R and psychometric testing of developmental

G2: 30.1 ± 13.6

Erikson scales, mean ± SD
Non-negativity
G1: 5.9 ± 1.8
G2: 6.2 ± 0.8

Non-avoidance
G1: 3.9 ± 1.5
G2: 4.1 ± 1.3

Compliance
G1: 3.8 ± 1.6
G2: 4.2 ± 1.3

CBCL mean ± SD
Internalizing
G1: 21.3 ± 9.4
G2: 16.9 ± 7.3
Externalizing
G1: 21.2 ± 11.1
G2: 19.4 ± 9.0

ICQ mean ± SD
Total score
G1: 146.4 ± 27.0
G2: 141.0 ± 18.0

Erikson scales
Non-negativity
G1: 0.7 ± 2.1
G2: 0.3 ± 1.3
p =ns

Non-avoidance
G1: 0.7 ± 1.5
G2: 0.5 ± 1.4
p =ns

Compliance
G1: 0.9 ± 1.5
G2: 0.5 ± 1.5
p =ns

Harms: NR

Modifiers: NR

Physical therapy, minutes per week **G1:** 8.3 ± 18.4 **G2:** 6.4 ± 14.9 Other individual therapy, min/week **G1:** 24.9 ± 59.5 **G2:** 22.7 ± 39.7 Parental counseling, min/week **G1:** 21.0 ± 30.9 **G2:** 28.2 ± 36.2 **N at enrollment:** **G1:** 40 **G2:** 35 **N at follow-up:** **G1:** 36 **G2:** 31	abilities **Diagnostic category, %:** Autism **G1:** 91.7 **G2:** 83.9 PDD-NOS **G1:** 8.3 **G2:** 16.1 **Other characteristics**, n (%)**:** SCL-90 Mothers (n = 57) **G1:** 126.7 (31.2) **G2:** 123 (28.0) Fathers (n = 47) **G1:** 113.2 (33.7) **G2:** 112.3 (21.9)

Comments: [a] Authors note that 8 participants who did not meet these criteria were included in the study (G1: 5 G2: 3). They were included based on clinical judgment of room for improvement. 2 of these had no endpoint data.

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Peters-Scheffer et al. 2010[85] **Country:** Netherlands **Intervention setting:** Preschool- day care centers **Enrollment period:** NR **Funding:** Stichting De Driestroom, Elst (The Netherlands) **Design:** Non-RCT pre-post	**Intervention:** Low intensity behavioral treatment (elements of TEACCH) on average 6.5 hrs / week + 5–10 (M= 6.29; SD = 1.31) hrs of one-to-one treatment / week, based on Lovaas + informal use of ABA by teachers Control group attended preschools in which no one-to-one behavioral treatment was given **Assessments:** Wechsler Preschool and Primary Scale of Intelligence-Revised, SON-2.5–7, Bayley Scales of Infant Development, VABS-composite, CBCL, PDD-MRS, BSID-II or SON-2.5-7 administered pre-treatment and after 8 months. VABS, CBCL, and PDD-MRS administered pre- and post-treatment; also at two, four, and six months of treatment. **Provider:** Trainers and teachers of the preschool; treatment supervised by special	**Inclusion criteria:** • a diagnosis of Autistic Disorder or PDD-NOS and intellectual disabilities (ID) based on DSM-IV criteria established by licensed and independent psychologist or psychiatrist; level of ID assessed by standard intelligence tests (e.g., Wechsler Preschool and Primary Scale of Intelligence- revised, SON-2.5-7, Bayley Scales of Infant Development) • chronological age below 7 years • absence of medical conditions (e.g., visual impairment; uncontrolled epilepsy) that could interfere with treatment **Exclusion criteria:** • see inclusion **Age, mean ± SD months (range):** **G1:** 53.50 ± 5.52 (42–62) **G2:** 52.95 ±11.14 (38–75**)**	Developmental age in months **G1:** 25.92 ± 7.57 **G2:**23.32 ± 6.33 Mental developmental index/IQ **G1:** 47.00 ± 10.33 **G2:** 45.73 ± 15.99 VABS-composite in months **G1:** 20.83 ± 6.69 **G2:** 19.18 ± 4.14 VABS-communication in months **G1:** 26.92 ± 12.12 **G2:** 25.00 ± 10.00 VABS-daily living in months **G1:** 23.83 ± 7.28 **G2:** 20.14 ± 4.68 VABS-socialization **G1:** 20.75 ± 4.54 **G2:** 24.64 ± 8.18 CBCL-total **G1:** 60.00 ± 8.37 **G2:** 66.91 ± 7.70 CBCL-internalizing **G1:** 60.58 ± 5.58 **G2:** 67.55 ± 6.27 CBCL-externalizing	Developmental age in months **G1:** 34.83 ± 10.89 **G2:** 25.73 ± 8.26 Mental developmental index/IQ **G1:** 55.83 ±14.94 **G2:** 43.73 ± 16.74 VABS-composite in months **G1:** 31.75 ± 10.96 **G2:** 22.05 ± 7.47 VABS-communication in months **G1:** 39.42 ± 15.39 **G2:** 29.95 ± 13.39 VABS-daily living in months **G1:** 33.25 ± 9.04 **G2:** 23.23 ± 7.70 VABS-socialization **G1:** 34.08 ± 8.14 **G2:** 25.14 ±7.21 CBCL-total **G1:** 58.25 ± 8.02 **G2:** 63.23 ± 7.98 CBCL-internalizing **G1:** 59.08 ± 7.74 **G2:** 64.41 ± 8.45

educator with 5 years of experience in applying ABA in young children **Treatment manual followed:** Yes **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** Yes **Groups:** **G1:** Early intervention **G2:** control **Co-interventions held stable during treatment:** NR **Frequency of contact during study:** baseline, 2, 3,4 months of Treatment and end of 8 months of Treatment **Concomitant therapies, n (%):** Individual physiotherapy, speech therapy, music therapy or play therapy with a maximum of 1hr /week :100% **N at enrollment:** **G1:** 12 **G2:** 22	**Mental Developmental Index/IQ, mean ± SD (range):** **G1:** 47.00 ± 10.33 (31-64) **G2:** 45.73 ± 15.99 (21-77) **Sex:** NR **Race/ethnicity, n (%):** NR **SES:** NR **Diagnostic approach:** Referral Diagnostic tool/method: DSM-IV **Diagnostic category, n (%):** NR **Other characteristics, n (%):** NR	**G1:** 58.92 ± 10.82 **G2:** 63.59 ± 7.89 PDD-MRS raw score **G1:** 11.58 ± 4.42 **G2:** 12.91 ± 3.79	CBCL-externalizing **G1:** 54.33 ± 8.52 **G2:** 58.86 ± 6.26 PDD-MRS raw score **G1:**10.25 ± 3.14 **G2:**11.27 ± 3.84 **Harms:** NR **Modifiers:** NR

	N at follow-up: **G1:** 12 **G2:** 22

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Wong 2010[86] **Country:** Hong Kong, China **Intervention setting:** Clinic **Enrollment period:** Jan – Dec 2007 **Funding:** NR **Design:** RCT, cross-over	**Intervention:** A short 2-week Early intervention with ten 30-min sessions, with a target improving communication and Social interaction. Intervention given between baseline and Time 1 for the intervention group and between Time 1 and Time 2 for the control group. The control Group undertook the Intervention starting from Week 5 and received the same 10-session intervention. By Time 2, both groups had completed the intervention, and they were combined* to give a larger sample size for detecting intervention effects **Assessments:** ADOS, Ritvo-Freeman Real Life Rating Scale, Symbolic Play Test, and Parenting Stress Index. Done at 3 time points (baseline, time 1, time 2). **Groups:**	**Inclusion criteria:** • consecutive newly diagnosed children with autism • children with autism referred to DKCAC for developmental assessment **Exclusion criteria:** NR **Age, mean ± SD, mos:** **G1:** 25.33 ± 6 **G2:** 27.88 ± 5.57 **Mental age,** mean ± SD mos (SD): **G1:** 17.85 ± 4.16 **G2:** 17.91 ± 4.49 **Sex, n (%):** M: 16 (94) F: 1 (6) Male **G1:** 8 **G2:** 8 Female **G1:** 1 **G2:** 0 **Race/ethnicity, n (%):** % minority status: NR **SES:** NR Maternal education	**Median (Range):** **ADOS (Communication and language):** **G1** (n = 9): Total: 11.0 (7.0–13.0) Vocalization: 2.0 (1.0–3.0) Pointing: 3.0 (1.0–3.0) Gestures: 2.0 (0.0–2.0) **G2** (n = 8): Total: 10.0 (7.0–14.0) Vocalization: 2.0 (2.0–2.0) Pointing: 3.0 (1.0–3.0) Gestures: 1.0 (0.0–2.0) **ADOS (Reciprocal social interaction)** : **G1:** Total: 22.0 (11.0–28.0) Unusual eye contact: 2.0 (2.0–2.0) Integration of gaze and other behaviors during social overtures: 2.0 (1.0–3.0) Requesting: 2.0 (1.0–3.0) **G2:** Total: 18.5 (13.0–26.0) Unusual eye contact: 2.0 (0.0–2.0) Integration of gaze and other behaviors during social overtures: 1.5 (1.0–3.0) Requesting: 2.0 (1.0–3.0)	**Median (Range):** **ADOS (Communication and language) :** No significant group difference in communication (X^2 = 0.95, p = 0.331) **G1:** Total: 7.0 (4.0–9.0) Vocalization: 1.0 (1.0–2.0) Pointing: 2.0 (1.0–3.0) Gestures: 1.0 (0.0–2.0) **G2:** Total: 7.50 (6.0–11.0) Vocalization: 1.0 (1.0–3.0) Pointing: 2.0 (0.0–3.0) Gestures: 1.0 (0.0–1.0) **ADOS (Reciprocal social interaction) :** No between group differences observed (X^2 = 0.46, p = 0.497) **G1:** Total: 15.0 (7.0–22.0) Unusual eye contact: 2.0 (0.0–2.0) Integration of gaze and other behaviors during social overtures: 1.0 (0.0–2.0)

	G1: Early intervention **G2:** control **Provider:** Trainer- autism therapist **Treatment manual followed:** NR **Defined protocol followed:** yes **Measure of treatment fidelity reported:** NR **Co-interventions held stable during treatment:** None **Concomitant therapies, n (%):** none **N at enrollment:** **G1:** 9 **G2:** 8 **N at follow-up:** **G1:** 9 **G2:** 8	NR Household income, mean (range): NR **Diagnostic approach:** In Study Diagnostic tool/method: DSM-IV, ADI-R, ADOS **Diagnostic category, n (%):** Autism : 17 (100) **Other characteristics:** CARS, mean ± SD, (range) **G1:** 35.67 ± 4.64 (29-41.5) **G2:** 36.88 ± 4.24 (30-40.5)	**SPT (Symbolic play) :** Standard score **G1:**12.0 (12.0–21.9) **G2:**13.7 (12.0–28.5)	Requesting: 0.0 (0.0–2.0) **G2:** Total: 16.0 (10.0–24.0) Unusual eye contact: 2.0 (2.0–2.0) Integration of gaze and other behaviors during social overtures: 1.0 (1.0–2.0) Requesting: 1.0 (0.0–2.0) **SPT (Symbolic play) :** Standard score **G1:** 12.7 (12.0–27.1) **G2:** 13.7 (12.0–28.5) **Commonly occurring co-morbidities:** No co-morbid neurological or psychiatric disorders **Harms:** NR **Modifiers:** NR

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures*	Outcomes
Author: Aman et al. 2009[35-38] **Country:** US **Intervention setting:** Clinic, home **Enrollment period:** NR **Funding:** NIMH **Design:** RCT Note: See earlier study[87] reporting on this population in 2011 AHRQ review[9]	**Intervention:** Risperidone (0.5 to 3.5 mg/day) or aripiprazole if risperidone was ineffective ((aripiprazole started at 2 mg and adjusted up to 15 mg) or a combination of medication plus parent training. Parents of children in combination group received an average of 11.4 parent training sessions. **Assessments:** Home Situations Questionnaire (HSQ), Aberrant Behavior Checklist-Irritability (ABC-I), Vineland Adaptive Behavior Scales (VABS), Noncompliance index. Assessed weekly for 8 weeks then every 4 weeks until week 24. Follow-up study at 1 year **Groups:** **G1:** risperidone **G2:** risperidone + parent training **Co-interventions held stable during treatment:** Yes **Frequency of contact**	**Inclusion criteria:** • age between 4 and 14 years • DSM-IV-TR diagnosis of autistic disorder, Asperger's disorder, or PDD-NOS based on clinical assessment and corroborated by the ADI-R • serious behavioral problems (e.g tantrums, aggression and self-injury) evidenced by score ≥ 18 on ABC-Irritability subscale and CGI-severity score ≥ 4 • IQ ≥ 35 or mental age of 18 months from Stanford-Binet 5, Leiter International Performance Scale or Mullen Scales of Early Learning • anticonvulsant treatment permissible if medication was stable (≥ 4 wks) and subject was seizure free (≥ 18 mos) **Exclusion criteria:** • significant medical condition by history,	**HSQ, mean ± SD:** Average severity score **G1:** 4.16 ± 1.47 **G2:** 4.31 ± 1.67 "Yes" count **G1:** 18.9 ± 3.46 **G2:** 18.6 ± 4.65 **ABC, mean ± SD:** Irritabilty **G1:** 29.7 ± 6.10 **G2:** 29.3 ± 6.97 Social withdrawal **G1:** 17.1 ± 8.37 **G2:** 15.2 ± 9.01 Stereotypic behavior **G1:** 10.6 ± 5.46 **G2:** 7.59 ± 5.20 Hyperactivity/non compliance **G1:** 36.1 ± 6.86 **G2:** 35.3 ± 9.30 Inappropriate speech **G1:** 6.37 ± 4.03 **G2:** 5.75 ± 3.43 **VABS, mean ± SD:** **Standard Score** Daily living skills **G1:** 41.14 ± 19.81 **G2:** 50.79 ± 18.49	**24 Week Follow-Up** **VABS, mean ± SD:** **Standard Score** Daily living skills **G1:** 45.34 ± 20.48 **G2:** 55.65 ± 21.86 Socialization **G1:** 56.59 ± 17.38 **G2:** 67.42 ± 18.48 Communication **G1:** 53.57 ± 20.23 **G2:** 63.90 ± 22.65 Adaptive Composite **G1:** 47.84 ± 15.81 **G2:** 57.87 ± 19.03 **Age Equivalent Score** Daily living skills **G1:** 3.49 ± 1.72 **G2:** 4.36 ± 2.25 Socialization **G1:** 2.71 ± 1.51 **G2:** 3.99 ± 2.56 Communication **G1:** 3.42 ± 2.18 **G2:** 4.58 ± 2.85 Adaptive Composite **G1:** 12.88 ± 10.83 **G2:** 8.41 ± 8.69 **One Year Follow-up****

during study: ~weekly across groups **Concomitant therapies, n (%):** NR **N at enrollment:** **G1:** 49 **G2:** 75 **N at follow-up (1 year):** **G1:** 36 **G2:** 51	exam or lab test • lifetime diagnosis of psychosis, bipolar disorder or current diagnosis of major depression, obsessive-compulsive disorder, substance abuse, or girls with positive Beta HCG pregnancy test **Age, mean/yrs ± SD:** **G1:** 7.5 ± 2.80 **G2:** 7.38 ± 2.21 **Mental age, mean/yrs (range):** NR **Sex:** NR Race/ethnicity, n (%): White/non Hispanic **G1:** 34 (69.4) **G2:** 59 (78.7) Hispanic **G1:** 7 (14.3) **G2:** 4 (5.3) African American **G1:** 7 (14.3) **G2:** 9 (12.1) Asian American **G1:** 0 **G2:** 3 (4.0) Native American **G1:** 1 (2.0) **G2:** 0	Socialization **G1:** 53.48 ± 14.41 **G2:** 59.55 ± 15.01 Communication **G1:** 53.18 ± 19.94 **G2:** 61.15 ± 20.95 Adaptive Composite **G1:** 45.84 ± 15.5 **G2:** 53.15 ± 15.66 **Age Equivalent Score** Daily living skills **G1:** 2.85 ± 1.52 **G2:** 3.63 ± 1.94 Socialization **G1:** 2.09 ± 1.08 **G2:** 2.80 ± 1.84 Communication **G1:** 3.12 ± 2.15 **G2:** 3.99 ± 2.65 Adaptive Composite **G1:** 18.91 ± 14.18 **G2:** 16.59 ± 11.44	**HSQ-mean** **G1:** 2.12 ± 1.87 **G2:** 1.84 ± 1.46 **HSQ "yes"** **G1:** 13.67± 7.04 **G2:** 12.69 ± 5.91 **ABC, mean ± SD** Irritability **G1:**15.25 ± 3.36 **G2:** 14.10 ± 3.60 Lethargy **G1:** 7.39 ±6.83 **G2:** 4.65 ± 5.21 Stereotypy **G1:** 5.61 ± 5.31 **G2:** 4.06 ± 3.67 Hyperactivity **G1:** 18.94 ± 11.42 **G2:** 17.37 ± 11.78 Inappropriate speech **G1:** 3.22 ± 3.36 **G2:** 3.27 ± 2.77 **Predictors, F** **HSQ Total Score** Income: 0.02 Maternal education: 0.40 Child age: 4.96 IQ: 3.18 ABC-Irritability: 1.13 ABC-Hyperactivity: 0.36 CGI-S: 0.08 CASI-ADHD/Combined: 0.02 CASI-ODD: 0.06 CASI-GAD: 0.77

	SES, mean ± SD: Income (US $) <20,000 **G1:** 12 ± 25.0 **G2:** 14 ± 18.7 20,001-40,000 **G1:** 14 ± 29.2 **G2:** 21 ± 28.0 40,001-60,000 **G1:** 10 ± 20.8 **G2:** 11 ± 14.7 60,001-90,000 **G1:** 7 ± 14.6 **G2:** 16 ± 21.3 >90,000 **G1:** 5 ± 10.4 **G2:** 13 ± 17.3 Maternal education <8th grade **G1:** 1 ± 2.0 **G2:** 4 ± 5.3 Some high school **G1:** 4 ± 8.2 **G2:** 3 ± 4.0 High school graduate/GED **G1:** 15 ± 30.6 **G2:** 18 ± 24.0 Some collage **G1:** 17 ± 34.7 **G2:** 28 ± 37.3 College graduate **G1:** 10 ± 20.4	CASI-Mood disorder: 0.84 CASI-PDD: 0.11 CYBOCS: 0.42 HSQ: 7.23 (p=0.007) PSI-Parental distress: 0.20 PSI-Total stress: 0.78 VABS-daily living: 0.18 VABS-socialization: 0.34 VABS-communication: 0.58 VABS-composite: 0.60 **ABC-Hyperactivity/Non-compliance** Income: 1.02 Maternal education:0.02 Child age: 3.23 IQ: 3.43 ABC-Irritability: 0,02 ABC-Hyperactivity: 0.31 CGI-S: 0.21 CASI-ADHD/Combined: 0.30 CASI-ODD: 0.00 CASI-GAD: 0.17 CASI-Mood disorder: 0.04 CASI-PDD: 2.47 CYBOCS: 0.38 HSQ: 0.29 PSI-Parental distress: 0.54 PSI-Total stress: 0.84 VABS-daily living: 3.62 VABS-socialization: 1.45 VABS-communication: 5.04 VABS-composite: 4.56 **Moderators, F** **HSQ Total Score** Income: 0.58 Maternal education:0.08 Child age: 0.43 IQ: 0.04 ABC-Irritability: 0.08

	G2: 12 ± 16.0 Advanced degree **G1:** 2 ± 4.1 **G2:** 10 ± 13.3 **Diagnostic approach:** In Study Diagnostic tool/method: DSM-IV-TR diagnosis based on clinical assessment and corroborated by the ADI-R **Diagnostic category, n (%):** Autism **G1:** 32 (65.3) **G2:** 49 (65.3) PDD-NOS **G1:** 13 (26.5) **G2:** 22 (29.3) Aspergers **G1:** 4 (8.2) **G2:** 4 (5.3) **Other characteristics:** **Educational placement, n (%):** F/T, regular education **G1:** 10 (20.4) **G2:** 18 (24.0) F/T, regular education with aide **G1:** 0 **G2:** 3 (4.0)	ABC-Hyperactivity: 0.15 CGI-S: 0.32 CASI-ADHD/Combined: 0.01 CASI-ODD: 3.38 CASI-GAD: 0.43 CASI-Mood disorder: 1.14 CASI-PDD: 0.39 CYBOCS: 1.96 HSQ: 2.27 PSI-Parental distress: 0.05 PSI-Total stress: 0.11 VABS-daily living: 0.12 VABS-socialization: 0.00 VABS-communication: 0.00 VABS-composite: 0.12 **ABC-Hyperactivity/Non-compliance** Income: 0.07 Maternal education: 0.67 Child age: 0.65 IQ: 0.96 ABC-Irritability: 0.04 ABC-Hyperactivity: 0.46 CGI-S: 2.13 CASI-ADHD/Combined: 0.73 CASI-ODD: 5.70 CASI-GAD: 0.84 CASI-Mood disorder: 1.92 CASI-PDD: 0.08 CYBOCS: 1.60 HSQ: 1.02 PSI-Parental distress: 0.01 PSI-Total stress: 0.00 VABS-daily living: 0.09 VABS-socialization: 0.09 VABS-communication: 0.22 VABS-composite: 0.04 None of the predictors / moderators were significant

	Regular education, some special **G1:** 5 (10.2) **G2:** 4 (5.3) Special education classroom **G1:** 8 (10.3) **G2:** 14 (18.7) Special elementary school **G1:** 3 (6.1) **G2:** 2 (2.7) Home school **G1:** 4 (8.2) **G2:** 5 (6.7) Special preschool **G1:** 11 (22.4) **G2:** 11 (14.7) Regular preschool **G1:** 6 (12.2) **G2:** 8 (10.7) No school **G1:** 2 (24.1) **G2:** 12 (16.0)	at $p<0.01$

Table C-1. Evidence table, continued

Study Description	Intervention	Inclusion/ Exclusion Criteria/ Population	Baseline Measures	Outcomes
Author: Kouijzer et al., 2009 [88, 89] **Country:** Netherlands, France **Intervention setting:** Private practice **Enrollment period:** NR **Funding:** NR **Design**: Non-RCT	**Intervention:** Twice a week for 40 sessions of seven 3-min intervals of EEG neurofeedback separated by 1-min rest intervals **Assessments:** QEEG, executive functions skills, communicative abilities, social interaction and behaviors **Groups:** **G1:** neurofeedback **G2:** control **Provider:** Psychotherapist **Treatment manual followed:** NR **Defined protocol followed:** Yes **Measure of treatment fidelity reported:** NR **Co-interventions held stable during treatment:** NR **Concomitant therapies, n (%):** NR **N at enrollment:**	**Inclusion criteria:** • IQ-score of ≥70 • presence of ASD as diagnosed by a child psychiatrist or health care psychologist **Exclusion criteria:** • children using medication • children with a history of severe brain injury • children with co-morbidity such as ADHD and epilepsy **Age, mean/yrs ± SD (range):** **G1:** 9.63 ± 1.53 (8-12) **G2:** 10.64 ± 1.41 (9-12) p=0.220 **Mental age,:** Total IQ, mean ± SD (range) **G1**: 92.50 ± 16.05 (73-111) **G2**: 93.83 ± 13.67 (82-199) p=0.891 Mean verbal IQ: **G1:** 97.80 ± 18.38 (77-119) **G2**: 95.40 ± 18.15 (78-125) p=0.841 Mean performal IQ: **G1:** 99.60 ± 25.77 (73-134) **G2**: 93.40 ± 9.71 (81-108)	**mean ± SD:** Attentional control Visual selective attention **G1:** 4.33 ± 2.81 **G2:** 9.14 ± 14.44 Auditory selective attention **G1:** 47.87 ± 14.21 **G2:** 67.79 ± 25.61 Inhibition of verbal responses **G1:** 68.17 ± 18.87 **G2:** 65.71 ± 31.53 Inhibition of motor responses **G1:** 78.50 ± 13.16 **G2:** 89.84 ± 11.02 Cognitive flexibility -Verbal memory **G1:** 53.33 ± 3.62 **G2:** 51.29 ± 2.63 Visual memory **G1:** 46.00 ± 3.74 **G2:** 41.00 ± 5.57 Shifting **G1:** 30.00 ± 15.68 **G2:** 29.71 ± 10.50 Concept generation **G1:** 2.55 ± 1.48 **G2:** 3.50 ± 1.70	**mean ± SD:** Attentional control Visual selective attention **G1:** 4.17 ± 4.26 **G2:** 7.29 ± 8.90 Auditory selective attention **G1:** 62.40 ± 14.18 **G2:** 68.90 ± 27.30 p = .014 Inhibition of verbal responses **G1:** 30.00 ± 12.12 **G2:** 50.14 ± 26.59 p = .049 Inhibition of motor responses **G1:** 89.93 ± 9.20 **G2:** 91.47 ± 9.66 Cognitive flexibility Verbal memory **G1:** 52.17 ± 4.07 **G2:** 50.57 ± 6.604 Visual memory **G1:** 45.00 ± 4.34 **G2:** 40.29 ± 8.321 Shifting **G1:** 47.00 ± 13.27 **G2:** 34.00 ± 13.29 p= .037

G1: 7 **G2:** 7 **N at follow-up:** **G1:** 7 **G2:** 7	p=0.628 **Sex:** M: 12 (86%) F: 2 (14%) **Race/ethnicity, n (%):** NR **SES:** NR Maternal education: NR Household income, mean (range): NR **Diagnostic approach:** In Study Diagnostic tool/method: DSM-IV confirmed by clinical psychologist and by results on the CCC questionnaire **Diagnostic category, n (%):** PDD-NOS: 14 (100%) **Other characteristics**, n (%)**:** NR	Goal setting **G1:** 55.45 ± 9.07 **G2:** 55.84 ± 18.17 Speed and efficiency **G1:** 34.33 ± 7.06 **G2:** 41.00 ±15.52 General communication **G1:** 115.14 ± 10.45 **G2:** 115.86 ± 9.42 Non-verbal communication **G1:** 15.86 (2.34 **G2:** 14.86 (2.85	Concept generation **G1:** 4.96 ±(.45) **G2:** 3.83 ±(1.42) p= .046 Goal setting **G1:** 75.85 ± 9.17 **G2:** 57.03 ± 11.89 p= .021 Speed and efficiency **G1:** 41.33 ± 5.13 **G2:** 43.86 ± 10.96 p= .542 No significant differences between post-treatment and 3-month follow-up measurements of children's executive functioning at follow-up General communication: **G1:**101.29 ± 12.09 **G2:**114.29 ± 16.45 Non-verbal communication **G1:** 13.71 ± 2.50 **G2:** 15.57 ± 2.76 p = .037 No group difference in any of the other subscales Auti-R: Social interaction **G1:**36.50 ± 3.51 **G2:**30.71 ± 0.92 p = .001

			Communication **G1:**29.00 ± 1.79 **G2:** 24.14 ± 0.64 p = .000 Typical behavior **G1:** 48.33 ± 3.44 **G2:** 44.14 ± 1.06 p = .018 Total **G1:**113.83 ± 7.17 **G2:** 99.00 ± 1.95 **12 months:** Only data for G1 reported continuation of improvement of selective attention after 12 months p < .010 Non-significant improvement was found for inhibition of verbal responses, verbal memory, concept generation, and speed and efficiency. No significant decrease of performance was found between post-assessment and follow-up data on any aspect of executive functioning Significant improvement maintained for general communication

Harms: NR

Modifiers: NR

References

1. Boyd BA, Hume K, McBee MT, et al. Comparative Efficacy of LEAP, TEACCH and Non-Model-Specific Special Education Programs for Preschoolers with Autism Spectrum Disorders. J Autism Dev Disord 2013 Jun 28.
2. Casenhiser DM, Shanker SG, Stieben J. Learning through interaction in children with autism: preliminary data from asocial-communication-based intervention. Autism 2013 Mar;17(2):220-41. PMID: 21949005.
3. Goods KS, Ishijima E, Chang Y-C, et al. Preschool Based JASPER Intervention in Minimally Verbal Children with Autism: Pilot RCT. Journal of Autism and Developmental Disorders 2013 May 2013;43(5):1050-6.
4. Ichikawa K, Takahashi Y, Ando M, et al. TEACCH-based group social skills training for children with high-functioning autism: a pilot randomized controlled trial. Biopsychosoc Med 2013;7(1):14. PMID: 24083413.
5. Kenworthy L, Anthony LG, Naiman DQ, et al. Randomized controlled effectiveness trial of executive function intervention for children on the autism spectrum. J Child Psychol Psychiatry 2013 Nov 21PMID: 24256459.
6. Malow BA, Adkins KW, Reynolds A, et al. Parent-Based Sleep Education for Children with Autism Spectrum Disorders. J Autism Dev Disord 2013 Jun 11. PMID: 23754339.
7. Mandelberg J, Frankel F, Cunningham T, et al. Long-term outcomes of parent-assisted social skills intervention for high-functioning children with autism spectrum disorders. Autism 2013 Aug 30. PMID: 23996903.
8. Frankel F, Myatt R, Sugar C, et al. A Randomized Controlled Study of Parent-assisted Children's Friendship Training with Children having Autism Spectrum Disorders. J Autism Dev Disord 2010 Jan 8 PMID: 20058059.
9. Warren Z, Veenstra-VanderWeele J, Stone W, Bruzek JL, Nahmias AS, Foss-Feig JH, Jerome RN, Krishnaswami S, Sathe NA, Glasser AM, Surawicz T, McPheeters ML. Therapies for Children With Autism Spectrum Disorders. Comparative Effectiveness Review No. 26. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2007-10065-I.) AHRQ Publication No. 11-EHC029-EF. Rockville, MD: Agency for Healthcare Research and Quality. April 2011. Available at: www.effectivehealthcare.ahrq.gov/reports/final.cfm.
10. McNally Keehn RH, Lincoln AJ, Brown MZ, et al. The Coping Cat program for children with anxiety and autism spectrum disorder: A pilot randomized controlled trial. Journal of Autism and Developmental Disorders 2013;43(1):57-67.
11. Paynter J, Peterson CC. Further Evidence of Benefits of Thought-Bubble Training for Theory of Mind Development in Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders 2013 February 2013;7(2):344-8.
12. Perry A, Blacklock K, Dunn Geier J. The relative importance of age and IQ as predictors of outcomes in Intensive Behavioral Intervention. Research in Autism Spectrum Disorders 2013;7(9):1142-50.
13. Perry A, Cummings A, Geier JD, et al. Effectiveness of Intensive Behavioral Intervention in a Large, Community-Based Program. Research in Autism Spectrum Disorders 2008 Oct;2(4):621-42.
14. Shine R, Perry A. The relationship between parental stress and intervention outcome of children with autism. Journal on Developmental Disabilities 2010;16(2):64-6.
15. Freeman N, Perry A. Outcomes of intensive behavioural intervention in the Toronto Preschool Autism Service. Journal on Developmental Disabilities 2010;16(2):17-32.
16. Perry A, Cummings A, Geier JD, et al. Predictors of Outcome for Children Receiving Intensive Behavioral Intervention in a Large, Community-Based Program. Research in Autism Spectrum Disorders 2011;5(1):592-603.

17. Flanagan HE, Perry A, Freeman NL. Effectiveness of large-scale community-based intensive Behavioral Intervention: A waitlist comparison study exploring outcomes and predictors. Research in Autism Spectrum Disorders 2012;6(2):673-82.
18. Peters-Scheffer N, Didden R, Mulders M, et al. Effectiveness of low intensity behavioral treatment for children with autism spectrum disorder and intellectual disability. Research in Autism Spectrum Disorders 2013;7(9):1012-25.
19. Reed P, Osborne LA, Makrygianni M, et al. Evaluation of the Barnet Early Autism Model (BEAM) Teaching Intervention Programme in a "Real World" Setting. Research in Autism Spectrum Disorders 2013 June 2013;7(6):631-8.
20. Schertz HH, Odom SL, Baggett KM, et al. Effects of Joint Attention Mediated Learning for Toddlers with Autism Spectrum Disorders: An Initial Randomized Controlled Study. Early Childhood Research Quarterly 2013 2013;28(2):249-58.
21. Schreibman L, Stahmer AC. A Randomized Trial Comparison of the Effects of Verbal and Pictorial Naturalistic Communication Strategies on Spoken Language for Young Children with Autism. J Autism Dev Disord 2013 Nov 23. PMID: 24272416.
22. Sharp WG, Burrell TL, Jaquess DL. The Autism MEAL Plan: A parent-training curriculum to manage eating aversions and low intake among children with autism. Autism 2013 Oct 7. PMID: 24101716.
23. Siller M, Hutman T, Sigman M. A Parent-Mediated Intervention to Increase Responsive Parental Behaviors and Child Communication in Children with ASD: A Randomized Clinical Trial. Journal of Autism and Developmental Disorders 2013;43(3):540-55.
24. Storch EA, Arnold EB, Lewin AB, et al. The effect of cognitive-behavioral therapy versus treatment as usual for anxiety in children with autism spectrum disorders: A randomized, controlled trial. Journal of the American Academy of Child & Adolescent Psychiatry 2013;52(2):132-42.
25. Warreyn P, Roeyers H. See what I see, do as I do: Promoting joint attention and imitation in preschoolers with autism spectrum disorder. Autism 2013 Oct 8. PMID: 24104513.
26. Wong CS. A play and joint attention intervention for teachers of young children with Autism: A randomized controlled pilot study. Autism 2013 May 2013;17(3):340-57.
27. Adkins KW, Molloy C, Weiss SK, et al. Effects of a standardized pamphlet on insomnia in children with autism spectrum disorders. Pediatrics 2012 Nov;130 Suppl 2:S139-44. PMID: 23118244.
28. Aldred C, Green J, Emsley R, et al. Mediation of treatment effect in a communication intervention for pre-school children with autism. Journal of Autism and Developmental Disorders 2012;42(3):447-54.
29. Aldred C, Green J, Adams C. A new social communication intervention for children with autism: pilot randomised controlled treatment study suggesting effectiveness. J Child Psychol Psychiatry 2004 Nov;45(8):1420-30. PMID: 15482502.
30. Cortesi F, Giannotti F, Sebestiani T, et al. Controlled-release melatonin, singly and combined with cognitive behavioural therapy, for persistent insomnia in children with autism spectrum disorders: A randomized placebo-controlled trial. Journal of Sleep Research 2012;21(6):700-9.
31. Dawson G, Jones EJ, Merkle K, et al. Early behavioral intervention is associated with normalized brain activity in young children with autism. J Am Acad Child Adolesc Psychiatry 2012 Nov;51(11):1150-9. PMID: 23101741.
32. Dawson G, Rogers S, Munson J, et al. Randomized, Controlled Trial of an Intervention for Toddlers With Autism: The Early Start Denver Model. Pediatrics 2010 January 2010.
33. Eikeseth S, Klintwall L, Jahr E, et al. Outcome for Children with Autism Receiving Early and Intensive Behavioral Intervention in Mainstream Preschool and Kindergarten Settings. Research in Autism Spectrum Disorders 2012;6(2):829-35.
34. Eldevik S, Hastings RP, Jahr E, et al. Outcomes of behavioral intervention for children with autism in mainstream pre-school settings. J Autism Dev Disord 2012 Feb;42(2):210-20. PMID: 21472360.

35. Scahill L, McDougle CJ, Aman MG, et al. Effects of risperidone and parent training on adaptive functioning in children with pervasive developmental disorders and serious behavioral problems. J Am Acad Child Adolesc Psychiatry 2012 Feb;51(2):136-46. PMID: 22265360.
36. Farmer C, Lecavalier L, Yu S, et al. Predictors and moderators of parent training efficacy in a sample of children with autism spectrum disorders and serious behavioral problems. J Autism Dev Disord 2012 Jun;42(6):1037-44. PMID: 21822762.
37. Arnold LE, Aman MG, Li X, et al. Research units of pediatric psychopharmacology (RUPP) autism network randomized clinical trial of parent training and medication: One-year follow-Up. Journal of the American Academy of Child & Adolescent Psychiatry 2012;51(11):1173-84.
38. Handen BL, Johnson CR, Butter EM, et al. Use of a Direct Observational Measure in a Trial of Risperidone and Parent Training in Children with Pervasive Developmental Disorders. J Dev Phys Disabil 2013 Jun 1;25(3):355-71. PMID: 23730123.
39. Ingersoll B. Brief report: effect of a focused imitation intervention on social functioning in children with autism. J Autism Dev Disord 2012 Aug;42(8):1768-73. PMID: 22146934.
40. Ingersoll B. Brief report: Pilot randomized controlled trial of reciprocal imitation training for teaching elicited and spontaneous imitation to children with autism. Journal of Autism and Developmental Disorders 2010;40(9):1154-60. 41. Kaale A, Smith L, Sponheim E. A randomized controlled trial of preschool-based joint attention intervention for children with autism. J Child Psychol Psychiatry 2012 Jan;53(1):97-105. PMID: 21883204.
42. Kasari C, Gulsrud A, Freeman S, et al. Longitudinal follow-up of children with autism receiving targeted interventions on joint attention and play. J Am Acad Child Adolesc Psychiatry 2012 May;51(5):487-95. PMID: 22525955.
43. Lawton K, Kasari C. Brief Report: Longitudinal Improvements in the Quality of Joint Attention in Preschool Children with Autism. Journal of Autism and Developmental Disorders 2012;42(2):307-12.
44. Kasari C, Freeman S, Paparella T. Joint attention and symbolic play in young children with autism: a randomized controlled intervention study. J Child Psychol Psychiatry 2006 Jun;47(6):611-20. PMID: 16712638.
45. Kasari C, Paparella T, Freeman S, et al. Language outcome in autism: randomized comparison of joint attention and play interventions. J Consult Clin Psychol 2008 Feb;76(1):125-37. PMID: 18229990.
46. Kasari C, Rotheram-Fuller E, Locke J, et al. Making the connection: randomized controlled trial of social skills at school for children with autism spectrum disorders. J Child Psychol Psychiatry 2012 Apr;53(4):431-9. PMID: 22118062.
47. Landa RJ, Holman KC, O'Neill AH, et al. Intervention targeting development of socially synchronous engagement in toddlers with autism spectrum disorder: a randomized controlled trial. J Child Psychol Psychiatry 2011 Jan;52(1):13-21. PMID: 21126245.
48. Landa RJ, Kalb LG. Long-term outcomes of toddlers with autism spectrum disorders exposed to short-term intervention. Pediatrics 2012 Nov;130 Suppl 2:S186-90. PMID: 23118250.
49. Lawton K, Kasari C. Teacher-implemented joint attention intervention: pilot randomized controlled study for preschoolers with autism. J Consult Clin Psychol 2012 Aug;80(4):687-93. PMID: 22582764.
50. Lerner MD, Mikami AY. A preliminary randomized controlled trial of two social skills interventions for youth with high-functioning autism spectrum disorders. Focus on Autism and Other Developmental Disabilities 2012;27(3):147-57.
51. Reaven J, Blakeley-Smith A, Culhane-Shelburne K, et al. Group cognitive behavior therapy for children with high-functioning autism spectrum disorders and anxiety: a randomized trial. J Child Psychol Psychiatry 2012 Apr;53(4):410-9. PMID: 22435114.
52. Reed P, Osborne L. Impact of Severity of Autism and Intervention Time-Input on Child Outcomes: Comparison across Several Early Interventions. British Journal of Special Education 2012;39(3):130-6.
53. Rogers SJ, Estes A, Lord C, et al. Effects of a brief Early Start Denver Model (ESDM)–based parent intervention on toddlers at risk for autism spectrum disorders: A randomized controlled trial. Journal of the American Academy of Child & Adolescent Psychiatry 2012;51(10):1052-65.

54. Estes A, Vismara L, Mercado C, et al. The Impact of Parent-Delivered Intervention on Parents of Very Young Children with Autism. J Autism Dev Disord 2013 Jul 10. PMID: 23838727.
55. Strauss K, Vicari S, Valeri G, et al. Parent inclusion in Early Intensive Behavioral Intervention: the influence of parental stress, parent treatment fidelity and parent-mediated generalization of behavior targets on child outcomes. Res Dev Disabil 2012 Mar-Apr;33(2):688-703. PMID: 22188793.
56. Fava L, Strauss K, Valeri G, et al. The Effectiveness of a Cross-Setting Complementary Staff- and Parent-Mediated Early Intensive Behavioral Intervention for Young Children with ASD. Research in Autism Spectrum Disorders 2011;5(4):1479-92.
57. Thomeer ML, Lopata C, Volker MA, et al. Randomized clinical trial replication of a psychosocial treatment for children with high-functioning autism spectrum disorders. Psychology in the Schools 2012;49(10):942-54.
58. Venker CE, McDuffie A, Weismer SE, et al. Increasing Verbal Responsiveness in Parents of Children with Autism: A Pilot Study. Autism: The International Journal of Research and Practice 2012;16(6):568-85.
59. Williams BT, Gray KM, Tonge BJ. Teaching Emotion Recognition Skills to Young Children with Autism: A Randomised Controlled Trial of an Emotion Training Programme. Journal of Child Psychology and Psychiatry 2012;53(12):1268-76.
60. Young RL, Posselt M. Using the transporters DVD as a learning tool for children with Autism Spectrum Disorders (ASD). J Autism Dev Disord 2012 Jun;42(6):984-91. PMID: 21822764.
61. Begeer S, Gevers C, Clifford P, et al. Theory of mind training in children with autism: A randomized controlled trial. Journal of Autism and Developmental Disorders 2011;41(8):997-1006.
62. Carter AS, Messinger DS, Stone WL, et al. A randomized controlled trial of Hanen's 'More Than Words' in toddlers with early autism symptoms. J Child Psychol Psychiatry 2011 Jul;52(7):741-52. PMID: 21418212.
63. Castorina LL, Negri LM. The inclusion of siblings in social skills training groups for boys with Asperger syndrome. J Autism Dev Disord 2011 Jan;41(1):73-81. PMID: 20461452.
64. DeRosier ME, Swick DC, Davis NO, et al. The efficacy of a Social Skills Group Intervention for improving social behaviors in children with High Functioning Autism Spectrum disorders. J Autism Dev Disord 2011 Aug;41(8):1033-43. PMID: 21042870.
65. Drahota A, Wood JJ, Sze KM, et al. Effects of cognitive behavioral therapy on daily living skills in children with high-functioning autism and concurrent anxiety disorders. J Autism Dev Disord 2011 Mar;41(3):257-65. PMID: 20508979.
66. Wood JJ, Drahota A, Sze K, et al. Brief Report: Effects of Cognitive Behavioral Therapy on Parent-Reported Autism Symptoms in School-Age Children with High-Functioning Autism. Journal of Autism and Developmental Disorders 2009 Nov;39(11):1608-12.
67. Wood JJ, Drahota A, Sze K, et al. Cognitive Behavioral Therapy for Anxiety in Children with Autism Spectrum Disorders: A Randomized, Controlled Trial. Journal of Child Psychology and Psychiatry 2009 Mar;50(3):224-34.
68. Zachor DA, Itzchak EB. Treatment Approach, Autism Severity and Intervention Outcomes in Young Children. Research in Autism Spectrum Disorders 2010;4(3):425-32..
69. Itzchak EB, Zachor DA. Who Benefits from Early Intervention in Autism Spectrum Disorders? Research in Autism Spectrum Disorders 2011;5(1):345-50.
70. Kovshoff H, Hastings RP, Remington B. Two-year outcomes for children with autism after the cessation of early intensive behavioral intervention. Behav Modif 2011 Sep;35(5):427-50. PMID: 21586502.
71. Remington B, Hastings RP, Kovshoff H, et al. Early intensive behavioral intervention: outcomes for children with autism and their parents after two years. Am J Ment Retard 2007 Nov;112(6):418-38. PMID: 17963434.
72. Murdock LC, Hobbs JQ. Picture Me Playing: Increasing Pretend Play Dialogue of Children with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders 2011;41(7):870-8.

73. Pajareya K, Nopmaneejumruslers K. A pilot randomized controlled trial of DIR/Floortime parent training intervention for pre-school children with autistic spectrum disorders. Autism 2011 Sep;15(5):563-77. PMID: 21690083.
74. Roberts J, Williams K, Carter M, et al. A Randomised Controlled Trial of Two Early Intervention Programs for Young Children with Autism: Centre-Based with Parent Program and Home-Based. Research in Autism Spectrum Disorders 2011;5(4):1553-66.
75. Scarpa A, Reyes NM. Improving emotion regulation with CBT in young children with high functioning autism spectrum disorders: a pilot study. Behav Cogn Psychother 2011 Jul;39(4):495-500. PMID: 21457605.
76. Strain PS, Bovey EH. Randomized, Controlled Trial of the Leap Model of Early Intervention for Young Children with Autism Spectrum Disorders. Topics in Early Childhood Special Education 2011;31(3):133-54.
77. Sung M, Ooi YP, Goh TJ, et al. Effects of cognitive-behavioral therapy on anxiety in children with autism spectrum disorders: a randomized controlled trial. Child Psychiatry Hum Dev 2011 Dec;42(6):634-49. PMID: 21660428.
78. Kasari C, Gulsrud AC, Wong C, et al. Randomized controlled caregiver mediated joint engagement intervention for toddlers with autism. Journal of Autism and Developmental Disorders 2010;40(9):1045-56.
79. Keen D, Couzens D, Muspratt S, et al. The effects of a parent-focused intervention for children with a recent diagnosis of autism spectrum disorder on parenting stress and competence. Research in Autism Spectrum Disorders 2010;4(2):229-41.
80. Koenig K, White SW, Pachler M, et al. Promoting social skill development in children with pervasive developmental disorders: a feasibility and efficacy study. J Autism Dev Disord 2010 Oct;40(10):1209-18. PMID: 20204689.
81. Kouijzer MEJ, van Schie HT, de Moor JMH, et al. Neurofeedback treatment in autism. Preliminary findings in behavioral, cognitive, and neurophysiological functioning. Research in Autism Spectrum Disorders 2010;4(3):386-99.
82. Lopata C, Thomeer ML, Volker MA, et al. RCT of a manualized social treatment for high-functioning autism spectrum disorders. J Autism Dev Disord 2010 Nov;40(11):1297-310. PMID: 20232240.
83. McConkey R, Truesdale-Kennedy M, Crawford H, et al. Preschoolers with Autism Spectrum Disorders: Evaluating the Impact of a Home-Based Intervention to Promote Their Communication. Early Child Development and Care 2010;180(3):299-315.
84. Oosterling I, Visser J, Swinkels S, et al. Randomized controlled trial of the focus parent training for toddlers with autism: 1-year outcome. J Autism Dev Disord 2010 Dec;40(12):1447-58. PMID: 20440639.
85. Peters-Scheffer N, Didden R, Mulders M, et al. Low intensity behavioral treatment supplementing preschool services for young children with autism spectrum disorders and severe to mild intellectual disability. Res Dev Disabil 2010 Nov-Dec;31(6):1678-84. PMID: 20627451.
86. Wong VCN, Kwan QK. Randomized controlled trial for early intervention for autism: A pilot study of the Autism 1-2-3 project. Journal of Autism and Developmental Disorders 2010;40(6):677-88.
87. Aman MG, McDougle CJ, Scahill L, et al. Medication and Parent Training in Children With Pervasive Developmental Disorders and Serious Behavior Problems: Results From a Randomized Clinical Trial. J Am Acad Child Adolesc Psychiatry 2009 Oct 23. PMID: 19858761.
88. Kouijzer MEJ, de Moor JMH, Gerrits BJL, et al. Neurofeedback Improves Executive Functioning in Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders 2009 Jan;3(1):145-62.
89. Kouijzer MEJ, de Moor JMH, Gerrits BJL, et al. Long-term effects of neurofeedback treatment in autism. Research in Autism Spectrum Disorders 2009;3(2):496-501.

Abbreviations in Evidence Table

ABA	Applied Behavioral Analysis
ABC	Aberrant Behavior Checklist
ABC-I	Aberrant Behavior Checklist - Irritability
ACS	Autism Characteristics and Severity
ADHD	Attention Deficit Hyperactivity Disorder
ADI-R	Autism Diagnostic Interview - Revised
ADIS	Anxiety Disorders Interview Schedule
ADIS-P	Anxiety Disorders Interview Schedule – Parent Rated
ADIS-C/P	Anxiety Disorders Interview Schedule – Child and Parent Rated Versions
ADL	Activities of daily living
ADOS	Autism Diagnostic Observation Schedule
ADOS-G	Autism Diagnostic Observation Schedule - Generic
AEPS	Assessment, Evaluation, and Programming System
ALQ	Achieved Learning Questionnaire
ANCOVA	Analysis of Covariance
ASD	Autism Spectrum Disorder
ASSQ	Autism Spectrum Screening Questionnaire (High-Functioning)
BAS-II	British Abilities Scale
BASC-2	Behavior Assessment System for Children
BASC-2-PRS	Behavior Assessment System for Children – Parent Rating Scale
BSID	Bayley Scales of Infant Development
CARS	Childhood Autism Rating Scale
CASL	Comprehensive Assessment of Spoken Language
CASI	Child and Adolescent Symptom Inventory
CASP	Child and Adolescent Social Perception Measure
CAST	Childhood Asperger Syndrome Test
CBCL	Child Behavioral Checklist
CBS-DP	Communication and Symbolic Behavior Scales – Developmental Profile
CBT	Cognitive Behavioral Therapy
CCC	Children's Communication Checklist
CDI	Communication developmental Inventories
CGI	Clinical Global Impression
CHAT	Checklist for Autism
CIS-P	Columbia Impairment Scale-Parent Rated
CSBS-DP	Communication and Symbolic Behavior Scales – Developmental Profile
CSBQ	Children's Social Behavior Questionnaire
CSHQ	Children's Sleep Habits Questionnaire
CSR	Clinician Severity Rating

CTM	Comparison Comprehensive Treatment Model
CYBOCS	Children's Yale-Brown Obsessive-Compulsive Scale
DANVA	Diagnostic Analysis of Non-Verbal Accuracy
DAS	Differential Abilities Scale
DBC	Developmental Behavior Checkllist
DIR	Developmental, Individual Differences, Relationship-based
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition
EEG	Electroencephalogram
EIBI	Early and Intensive Behavioral Intervention
EL	Expressive Language
ELC	Early Learning Composite
ESAT	Early Screening for Autistic Traits
ESCS	Early Social Communications Scale
ESDM	Early Start Denver Model
EVT	Expressive Vocabulary Test
FAF	Facing Your Fears
FEAS	Functional Emotional Assessment Scale
FEDQ	Functional Emotional Development Questionnaire
FPI	Focused Playtime Intervention
FSIQ	Full Scale Intelligence Quotient
GAD	Generalized Anxiety Disorder
GARS	Gilliam Autism Rating Scale
GCSE	General Certificate of Secondary Education
GHQ	General Health Questionnaire
GMDS-ER	Griffiths Mental Development Scale – Extended Revised
HFASD	High-Functioning Autism Spectrum Disorder
HSQ	Home Situations Questionnaire
IBI	Intensive Behavioral Intervention
ICD-10	International Statistical Classification of Diseases
ICQ	Infant Characteristics Questionnaire
ID	Intellectual Disabilities
IJA	Initiating Joint Attention
IS	Interpersonal Synchrony
ITT	Intention to Treat
IQ	Intelligence Quotient
JA	Joint Attention
JASP/ER	Joint Attention and Symbolic Play/Engagement and Regulation Intervention
JE	Joint Engagement
LEAP	Learning Experiences and Alternative Program for Preschoolers

LEAS-C	The Levels of Emotional Awareness Scale for Children
MASC-P	Multidimensional Anxiety Scale for Children- Parent Rated
MCDI	MacArthur-Bates Communicative Development Inventory
MSEL	Mullen Scales of Early Learning
MTW	More Than Words
NEPSY-II	A Developmental Neuropsychological Assessment
NR	Not Reported
NRCT	Nonrandomized controlled trial
NS	Not Statistically Significant
NCD-I	MacArthur Communicative Development Inventory (Dutch Version)
OCD	Obsessive-Compulsive Disorder
ODD	Oppositional Defiant Disorder
PARS	Pediatric Anxiety Rating Scale
PCFP	Parent child free play
PCIQ	Parent-Child Interaction Questionnaire
PDD-BI	Pervasive Development Disorder - Behavior Inventory
PDD-MRS	Pervasive Development Disorder in Mentally Retarded Persons
PDD-NOS	Pervasive Developmental Disorder- Not Otherwise Specified
PECS	Picture Exchange Communication System
PEP-R	Psycho-Educational Profile – Revised
P-ESDM	Parent Delivery – Early Start Denver Model
PIA-CV	Parent Interview for Autism – Clinical Version
PIQ	Performance Intelligence Quotient
PLS-4	Preschool Language Scale
PPVT-4	Peabody Picture Vocabulary Test
PSI	Parental Stress Index
PSOC	Parenting Sense of Competence
RCMAS	Revised Children's Manifest Anxiety Scale
RCT	Randomized, Controlled Trials
RDLS	Reynell Developmental Language Scale
RSI-T	Reciprocal Social Interaction – Teacher Rated
SACA	Service Assessment for Children and Adolescents—Service Use Scale
SAD	Separation Anxiety Disorder
SCARED	Screen for Childhood Anxiety Related Emotional Disorders
SCAS	Spence Children's Interview Scale
SCAS-C	Spence Child Anxiety Scale – Child Rated
SCAS-P	Spence Children's Interview Scale – Parent Rate (?)
SCL-90-R	Symptoms Checklist – 90 – Revised
SCQ	Social Communication Questionnaire

SD	Standard Deviation
SDARI	Sociodramatic Affective Relational Intervention
SE	Standard error
SEI	Socially Engage Imitation
SES	Socioeconomic Status
SIB-R	Scales of Independent Behavior – Revised
SIOS	Social Interaction Observation System
SKA	Skillstreaming Knowledge Assessment
SOL	Sleep Onset Latency
SON-2.5-7	Snijders-Oomen Non-verbal Intelligence Test
SPA	Shared Positive Affect
SR	Social Recreational
SRB-P	Sensory and Repetitive Behaviors – Parent Rated
SRB-T	Sensory and Repetitive Behaviors – Teacher Rated
SRS	Social Responsiveness Scale
S.S. GRIN-HFA	Social Skills Group Intervention – High Functioning Autism
SSRI	Selective Serotonin Reuptake Inhibitor
SSRS-P	Social Skills Rating System – Parent Rated
SSRS-T	Social Skills Rating System – Teacher Rated
STAT	Screening Tool for Autism
TOM	Theory of Mind
TPSS	Teacher Perceptions of Social Skills
VABS	Vineland Adaptive Behavior Scales
VIQ	Verbal Intelligence Quotient
VR	Visual reception
WASI	Wechsler Abbreviated Scale of Intelligence
WASO	Wake After Sleep Onset
WISC-IV	Wechsler Intelligence Scale IV
WPPSI	Wechsler Preschool and Primary Scale of Intelligence

Appendix D. Quality of the Literature

Table D-1. Quality of the literature

First Author Year	Group Design	Random Assignment	Appropriate Comparison Group	Correct Randomization	Systematic Diagnostic Approach	Clear Sample Characterization	Clear Inclusion/ Exclusion Criteria	Attrition Reported	Drop out Characteristics Evaluated	Intervention Fully Described	Treatment Fidelity Monitored	Concomitant Interventions Held Steady/ Reported	Outcome Measures Reliable and Valid	Primary Outcomes Specified *a priori*	Outcome Data Collected From Appropriate Sources	Outcomes Coded Blindly	Appropriate Statistical Analysis	Rating
Boyd 2013[1]	+	-	+	NA	+	+	+	+	NA	+	+	-	+	+	+	-	-	F
Casenhiser 2013[2]	+	+	+	+	+	+	+	+	NA	+	+	-	+	+	+	+	+	F
Fujii 2013[3]	+	+	+	-	+	+	+	+	NA	+	+	+	+	+	+	+	-	F
Goods 2013[4]	+	+	+	+	+	+	+	+	NA	+	+	NA	+	+	+	+	+	G
Ichikawa 2013[5]	+	+	+	+	-	+	+	+	NA	+	-	-	+	+	+	-	+	P
Kasari 2013[6]	+	+	+	+	-	+	+	+	NA	+	+	-	+	+	+	-	+	F
Kenworthy 2013[7]	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	-	G
Malow 2013[8]	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+	-	-	F
McNally-Keehn 2013[9]	+	+	+	+	+	+	+	+	NA	+	+	+	+	+	+	-	+	G

Paynter 2013[10]	+	-	+	-	+	+	-	+	NA	+	-	-	+	-	+	-	-	F
Peters-Scheffer 2013[11]	+	-	+	NA	+	+	+	+	-	+	+	-	+	-	+	-	+	G
Reed 2013[12]	+	-	+	NA	+	+	+	-	-	+	-	-	+	-	+	-	-	P
Schertz 2013[13]	+	+	+	-	+	+	+	+	NA	+	+	-	+	+	+	+	+	F
Schreibman 2013[14]	+	+	+	+	+	+	+	+	NA	+	+	+	+	+	+	-	+	G
Sharp 2013[15]	+	+	+	-	-	-	+	+	+	+	-	-	+	+	+	-	-	P
Storch 2013[16]	+	+	+	-	+	+	+	+	NA	+	+	+	+	+	+	+	-	G
Warreyn 2013[17]	+	+	+	-	+	+	+	+	-	+	-	-	+	+	+	-	-	F
Adkins 2012[18]	+	+	+	-	+	+	+	+	NA	+	-	+	+	+	+	-	+	F
Cortesi 2010[19]	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-	-	F
Eikeseth 2012[20]	+	-	+	NA	-	+	-	+	-	+	-	-	+	+	+	-	-	F
Eldevik 2012[21]	+	-	+	NA	-	+	+	+	NA	+	-	-	+	-	+	-	+	F
Flanagan 2012[22-27]	+	-	+	NA	+	+	+	NA	-	+	-	-	+	+	+	-	+	F
Kaale 2012[28]	+	+	+	+	+	+	+	+	NA	+	+	+	+	+	+	+	+	F
Kasari 2012[29]	+	+	+	+	+	+	+	+	NA	+	-	-	+	+	+	-	+	F
Lawton 2012[30]	+	+	+	+	+	+	+	+	NA	+	+	+	+	+	+	+	-	F

Lerner 2012[31]	+	+	+	-	-	+	-	+	NA	+	+	-	+	+	+	+	+	F
Reaven 2012[32]	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	G
Rogers 2012[33, 34]	+	+	+	+	+	+	+	-	-	+	+	+	+	+	+	-	-	F
Strauss 2012[35, 36]	+	-	+	NA	+	+	+	+	NA	+	+	-	+	+	+	-	+	G
Thomeer 2012[37]	+	+	+	-	-	+	+	+	NA	+	+	+	+	+	+	-	+	F
Venker 2012[38]	+	+	+	-	+	+	-	-	-	+	+	-	+	+	+	-	+	F
Williams 2012[39]	+	+	+	+	+	+	+	+	NA	+	+	-	+	+	+	+	+	G
Young 2012[40]	+	+	+	-	+	+	+	+	NA	+	+	-	+	+	+	-	+	F
Begeer 2011[41]	+	+	+	+	+	+	+	+	NA	+	+	-	+	+	+	-	+	F
Carter 2011[42]	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+	+	+	F
Castorina 2011[43]	+	-	+	NA	-	+	+	+	NA	+	+	-	+	+	+	-	+	F
DeRosier 2011[44]	+	+	+	-	-	+	+	+	+	+	+	-	+	+	+	-	+	F
Landa 2011[45, 46]	+	+	+	-	+	+	+	+	NA	+	+	+	+	+	+	+	+	G
Murdock 2011[47]	+	-	+	NA	-	+	+	+	NA	+	-	-	+	+	+	-	-	P
Pajareya 2011[48]	+	+	+	+	+	+	+	+	NA	+	-	+	+	+	+	-	+	F
Roberts 2011[49]	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	G

Scarpa 2011[50]	+	+	+	-	+	+	+	+	NA	+	-	-	-	+	+	-	+	F
Strain 2011[51]	+	+	+	-	-	+	+	+	NA	+	+	-	+	+	+	-	+	F
Sung 2011[52]	+	+	+	-	+	+	+	+	-	+	+	+	+	+	+	-	-	G
Wood 2011[53-55]	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+	+	+	G
Ingersoll 2010[56, 57]	+	+	+	-	+	+	+	+	NA	+	+	-	+	+	+	+	+	G
Itzchak 2010[58, 59]	+	-	+	NA	+	+	+	-	-	+	-	-	+	+	+	-	-	F
Kasari 2010[60]	+	+	+	+	+	+	+	+	NA	+	+	+	+	+	+	+	+	G
Keen 2010[61]	+	-	+	NA	+	+	-	+	NA	+	+	-	+	+	+	-	+	G
Koenig 2010[62]	+	+	+	+	+	+	+	+	NA	+	+	+	+	+	+	+	-	G
Kouijzer 2010[63]	+	+	+	-	+	+	+	+	NA	+	NA	-	+	+	+	-	-	F
Lopata 2010[64]	+	+	+	+	-	+	+	+	NA	+	+	+	+	+	+	-	+	F
McConkey 2010[65]	+	-	-	NA	-	+	+	+	-	+	-	-	+	-	+	-	+	P
Oosterling 2010[66]	+	+	+	-	+	+	+	+	-	+	+	-	+	+	+	-	-	F
Peters-Sheffer 2010[67]	+	-	+	NA	+	+	+	+	NA	+	-	+	+	+	+	-	+	F
Reed 2010[68]	+	-	+	NA	+	+	+	-	-	+	-	-	+	+	+	+	-	F

Siller 2010[69]	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	F
Wong 2010[70]	+	+	+	-	+	+	+	+	NA	-	-	-	+	+	+	+	-	P
Dawson 2009[71, 72]	+	+	+	+	+	+	+	+	-	+	+	+	+	+	-	-	-	G
Kouizjer 2009[73, 74]	+	-	+	NA	-	+	+	NA	NA	+	-	-	+	-	+	-	-	P
RUPP 2009 [75-78]	+	+	+	-	+	+	+	+	-	+	+	+	+	+	+	-	+	F
Remington 2007[79, 80]	+	-	+	NA	+	+	+	+	-	-	-	+	+	+	+	-	-	P
Kasari 2006[81-84]	+	+	+	-	+	+	+	+	-	+	+	-	+	+	+	+	+	F
Aldred 2004[85, 86]	+	+	+	+	+	+	+	+	NA	+	-	-	+	+	+	+	+	G

F=fair; G=good; NA=not applicable; P=poor

References

1. Boyd BA, Hume K, McBee MT, et al. Comparative Efficacy of LEAP, TEACCH and Non-Model-Specific Special Education Programs for Preschoolers with Autism Spectrum Disorders. J Autism Dev Disord 2013 Jun 28PMID: 23812661.
2. Casenhiser DM, Shanker SG, Stieben J. Learning through interaction in children with autism: preliminary data from asocial-communication-based intervention. Autism 2013 Mar;17(2):220-41. PMID: 21949005.
3. Fujii C, Renno P, McLeod BD, et al. Intensive cognitive behavioral therapy for anxiety disorders in school-aged children with autism: A preliminary comparison with treatment-as-usual. School Mental Health 2013;5(1):25-37.
4. Goods KS, Ishijima E, Chang Y-C, et al. Preschool Based JASPER Intervention in Minimally Verbal Children with Autism: Pilot RCT. Journal of Autism and Developmental Disorders 2013 May 2013;43(5):1050-6.
5. Ichikawa K, Takahashi Y, Ando M, et al. TEACCH-based group social skills training for children with high-functioning autism: a pilot randomized controlled trial. Biopsychosoc Med 2013;7(1):14. PMID: 24083413.
6. Wong CS. A play and joint attention intervention for teachers of young children with Autism: A randomized controlled pilot study. Autism 2013 May 2013;17(3):340-57.
7. Kenworthy L, Anthony LG, Naiman DQ, et al. Randomized controlled effectiveness trial of executive function intervention for children on the autism spectrum. J Child Psychol Psychiatry 2013 Nov 21PMID: 24256459.
8. Malow BA, Adkins KW, Reynolds A, et al. Parent-Based Sleep Education for Children with Autism Spectrum Disorders. J Autism Dev Disord 2013 Jun 11PMID: 23754339.
9. McNally Keehn RH, Lincoln AJ, Brown MZ, et al. The Coping Cat program for children with anxiety and autism spectrum disorder: A pilot randomized controlled trial. Journal of Autism and Developmental Disorders 2013;43(1):57-67.
10. Paynter J, Peterson CC. Further Evidence of Benefits of Thought-Bubble Training for Theory of Mind Development in Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders 2013 February 2013;7(2):344-8.
11. Peters-Scheffer N, Didden R, Mulders M, et al. Effectiveness of low intensity behavioral treatment for children with autism spectrum disorder and intellectual disability. Research in Autism Spectrum Disorders 2013;7(9):1012-25.
12. Reed P, Osborne LA, Makrygianni M, et al. Evaluation of the Barnet Early Autism Model (BEAM) Teaching Intervention Programme in a "Real World" Setting. Research in Autism Spectrum Disorders 2013 June 2013;7(6):631-8.
13. Schertz HH, Odom SL, Baggett KM, et al. Effects of Joint Attention Mediated Learning for Toddlers with Autism Spectrum Disorders: An Initial Randomized Controlled Study. Early Childhood Research Quarterly 2013 2013;28(2):249-58.
14. Schreibman L, Stahmer AC. A Randomized Trial Comparison of the Effects of Verbal and Pictorial Naturalistic Communication Strategies on Spoken Language for Young Children with Autism. J Autism Dev Disord 2013 Nov 23 PMID: 24272416.
15. Sharp WG, Burrell TL, Jaquess DL. The Autism MEAL Plan: A parent-training curriculum to manage eating aversions and low intake among children with autism. Autism 2013 Oct 7 PMID: 24101716.
16. Storch EA, Arnold EB, Lewin AB, et al. The effect of cognitive-behavioral therapy versus treatment as usual for anxiety in children with autism spectrum disorders: A randomized, controlled trial. Journal of the American Academy of Child & Adolescent Psychiatry 2013;52(2):132-42.
17. Warreyn P, Roeyers H. See what I see, do as I do: Promoting joint attention and imitation in preschoolers with autism spectrum disorder. Autism 2013 Oct 8 PMID: 24104513.

18. Adkins KW, Molloy C, Weiss SK, et al. Effects of a standardized pamphlet on insomnia in children with autism spectrum disorders. Pediatrics 2012 Nov;130 Suppl 2:S139-44. PMID: 23118244.
19. Cortesi F, Giannotti F, Sebestiani T, et al. Controlled-release melatonin, singly and combined with cognitive behavioural therapy, for persistent insomnia in children with autism spectrum disorders: A randomized placebo-controlled trial. Journal of Sleep Research 2012;21(6):700-9.
20. Eikeseth S, Klintwall L, Jahr E, et al. Outcome for Children with Autism Receiving Early and Intensive Behavioral Intervention in Mainstream Preschool and Kindergarten Settings. Research in Autism Spectrum Disorders 2012;6(2):829-35.
21. Eldevik S, Hastings RP, Jahr E, et al. Outcomes of behavioral intervention for children with autism in mainstream pre-school settings. J Autism Dev Disord 2012 Feb;42(2):210-20. PMID: 21472360.
22. Flanagan HE, Perry A, Freeman NL. Effectiveness of large-scale community-based intensive Behavioral Intervention: A waitlist comparison study exploring outcomes and predictors. Research in Autism Spectrum Disorders 2012;6(2):673-82.
23. Perry A, Cummings A, Geier JD, et al. Effectiveness of Intensive Behavioral Intervention in a Large, Community-Based Program. Research in Autism Spectrum Disorders 2008 Oct;2(4):621-42.
24. Shine R, Perry A. The relationship between parental stress and intervention outcome of children with autism. Journal on Developmental Disabilities 2010;16(2):64-6.
25. Freeman N, Perry A. Outcomes of intensive behavioural intervention in the Toronto Preschool Autism Service. Journal on Developmental Disabilities 2010;16(2):17-32.
26. Perry A, Cummings A, Geier JD, et al. Predictors of Outcome for Children Receiving Intensive Behavioral Intervention in a Large, Community-Based Program. Research in Autism Spectrum Disorders 2011;5(1):592-603.
27. Perry A, Blacklock K, Dunn Geier J. The relative importance of age and IQ as predictors of outcomes in Intensive Behavioral Intervention. Research in Autism Spectrum Disorders 2013;7(9):1142-50.
28. Kaale A, Smith L, Sponheim E. A randomized controlled trial of preschool-based joint attention intervention for children with autism. J Child Psychol Psychiatry 2012 Jan;53(1):97-105. PMID: 21883204.
29. Kasari C, Rotheram-Fuller E, Locke J, et al. Making the connection: randomized controlled trial of social skills at school for children with autism spectrum disorders. J Child Psychol Psychiatry 2012 Apr;53(4):431-9. PMID: 22118062.
30. Lawton K, Kasari C. Teacher-implemented joint attention intervention: pilot randomized controlled study for preschoolers with autism. J Consult Clin Psychol 2012 Aug;80(4):687-93. PMID: 22582764.
31. Lerner MD, Mikami AY. A preliminary randomized controlled trial of two social skills interventions for youth with high-functioning autism spectrum disorders. Focus on Autism and Other Developmental Disabilities 2012;27(3):147-57.
32. Reaven J, Blakeley-Smith A, Culhane-Shelburne K, et al. Group cognitive behavior therapy for children with high-functioning autism spectrum disorders and anxiety: a randomized trial. J Child Psychol Psychiatry 2012 Apr;53(4):410-9. PMID: 22435114.
33. Rogers SJ, Estes A, Lord C, et al. Effects of a brief Early Start Denver Model (ESDM)–based parent intervention on toddlers at risk for autism spectrum disorders: A randomized controlled trial. Journal of the American Academy of Child & Adolescent Psychiatry 2012;51(10):1052-65.
34. Estes A, Vismara L, Mercado C, et al. The Impact of Parent-Delivered Intervention on Parents of Very Young Children with Autism. J Autism Dev Disord 2013 Jul 10PMID: 23838727.
35. Strauss K, Vicari S, Valeri G, et al. Parent inclusion in Early Intensive Behavioral Intervention: the influence of parental stress, parent treatment fidelity and parent-mediated generalization of behavior targets on child outcomes. Res Dev Disabil 2012 Mar-Apr;33(2):688-703. PMID: 22188793.

36. Fava L, Strauss K, Valeri G, et al. The Effectiveness of a Cross-Setting Complementary Staff- and Parent-Mediated Early Intensive Behavioral Intervention for Young Children with ASD. Research in Autism Spectrum Disorders 2011;5(4):1479-92.
37. Thomeer ML, Lopata C, Volker MA, et al. Randomized clinical trial replication of a psychosocial treatment for children with high-functioning autism spectrum disorders. Psychology in the Schools 2012;49(10):942-54.
38. Venker CE, McDuffie A, Weismer SE, et al. Increasing Verbal Responsiveness in Parents of Children with Autism: A Pilot Study. Autism: The International Journal of Research and Practice 2012;16(6):568-85.
39. Williams BT, Gray KM, Tonge BJ. Teaching Emotion Recognition Skills to Young Children with Autism: A Randomised Controlled Trial of an Emotion Training Programme. Journal of Child Psychology and Psychiatry 2012;53(12):1268-76.
40. Young RL, Posselt M. Using the transporters DVD as a learning tool for children with Autism Spectrum Disorders (ASD). J Autism Dev Disord 2012 Jun;42(6):984-91. PMID: 21822764.
41. Begeer S, Gevers C, Clifford P, et al. Theory of mind training in children with autism: A randomized controlled trial. Journal of Autism and Developmental Disorders 2011;41(8):997-1006.
42. Carter AS, Messinger DS, Stone WL, et al. A randomized controlled trial of Hanen's 'More Than Words' in toddlers with early autism symptoms. J Child Psychol Psychiatry 2011 Jul;52(7):741-52. PMID: 21418212.
43. Castorina LL, Negri LM. The inclusion of siblings in social skills training groups for boys with Asperger syndrome. J Autism Dev Disord 2011 Jan;41(1):73-81. PMID: 20461452.
44. DeRosier ME, Swick DC, Davis NO, et al. The efficacy of a Social Skills Group Intervention for improving social behaviors in children with High Functioning Autism Spectrum disorders. J Autism Dev Disord 2011 Aug;41(8):1033-43. PMID: 21042870.
45. Landa RJ, Holman KC, O'Neill AH, et al. Intervention targeting development of socially synchronous engagement in toddlers with autism spectrum disorder: a randomized controlled trial. J Child Psychol Psychiatry 2011 Jan;52(1):13-21. PMID: 21126245.
46. Landa RJ, Kalb LG. Long-term outcomes of toddlers with autism spectrum disorders exposed to short-term intervention. Pediatrics 2012 Nov;130 Suppl 2:S186-90. PMID: 23118250.
47. Murdock LC, Hobbs JQ. Picture Me Playing: Increasing Pretend Play Dialogue of Children with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders 2011;41(7):870-8.
48. Pajareya K, Nopmaneejumruslers K. A pilot randomized controlled trial of DIR/Floortime parent training intervention for pre-school children with autistic spectrum disorders. Autism 2011 Sep;15(5):563-77. PMID: 21690083.
49. Roberts J, Williams K, Carter M, et al. A Randomised Controlled Trial of Two Early Intervention Programs for Young Children with Autism: Centre-Based with Parent Program and Home-Based. Research in Autism Spectrum Disorders 2011;5(4):1553-66.
50. Scarpa A, Reyes NM. Improving emotion regulation with CBT in young children with high functioning autism spectrum disorders: a pilot study. Behav Cogn Psychother 2011 Jul;39(4):495-500. PMID: 21457605.
51. Strain PS, Bovey EH. Randomized, Controlled Trial of the Leap Model of Early Intervention for Young Children with Autism Spectrum Disorders. Topics in Early Childhood Special Education 2011;31(3):133-54.
52. Sung M, Ooi YP, Goh TJ, et al. Effects of cognitive-behavioral therapy on anxiety in children with autism spectrum disorders: a randomized controlled trial. Child Psychiatry Hum Dev 2011 Dec;42(6):634-49. PMID: 21660428.
53. Drahota A, Wood JJ, Sze KM, et al. Effects of cognitive behavioral therapy on daily living skills in children with high-functioning autism and concurrent anxiety disorders. J Autism Dev Disord 2011 Mar;41(3):257-65. PMID: 20508979.

54. Wood JJ, Drahota A, Sze K, et al. Cognitive Behavioral Therapy for Anxiety in Children with Autism Spectrum Disorders: A Randomized, Controlled Trial. Journal of Child Psychology and Psychiatry 2009 Mar;50(3):224-34.
55. Wood JJ, Drahota A, Sze K, et al. Brief Report: Effects of Cognitive Behavioral Therapy on Parent-Reported Autism Symptoms in School-Age Children with High-Functioning Autism. Journal of Autism and Developmental Disorders 2009 Nov;39(11):1608-12.
56. Ingersoll B. Brief report: Pilot randomized controlled trial of reciprocal imitation training for teaching elicited and spontaneous imitation to children with autism. Journal of Autism and Developmental Disorders 2010;40(9):1154-60.
57. Ingersoll B. Brief report: effect of a focused imitation intervention on social functioning in children with autism. J Autism Dev Disord 2012 Aug;42(8):1768-73. PMID: 22146934.
58. Itzchak EB, Zachor DA. Who Benefits from Early Intervention in Autism Spectrum Disorders? Research in Autism Spectrum Disorders 2011;5(1):345-50.
59. Zachor DA, Itzchak EB. Treatment Approach, Autism Severity and Intervention Outcomes in Young Children. Research in Autism Spectrum Disorders 2010;4(3):425-32.
60. Kasari C, Gulsrud AC, Wong C, et al. Randomized controlled caregiver mediated joint engagement intervention for toddlers with autism. Journal of Autism and Developmental Disorders 2010;40(9):1045-56.
61. Keen D, Couzens D, Muspratt S, et al. The effects of a parent-focused intervention for children with a recent diagnosis of autism spectrum disorder on parenting stress and competence. Research in Autism Spectrum Disorders 2010;4(2):229-41.
62. Koenig K, White SW, Pachler M, et al. Promoting social skill development in children with pervasive developmental disorders: a feasibility and efficacy study. J Autism Dev Disord 2010 Oct;40(10):1209-18. PMID: 20204689.
63. Kouijzer MEJ, van Schie HT, de Moor JMH, et al. Neurofeedback treatment in autism. Preliminary findings in behavioral, cognitive, and neurophysiological functioning. Research in Autism Spectrum Disorders 2010;4(3):386-99.
64. Lopata C, Thomeer ML, Volker MA, et al. RCT of a manualized social treatment for high-functioning autism spectrum disorders. J Autism Dev Disord 2010 Nov;40(11):1297-310. PMID: 20232240.
65. McConkey R, Truesdale-Kennedy M, Crawford H, et al. Preschoolers with Autism Spectrum Disorders: Evaluating the Impact of a Home-Based Intervention to Promote Their Communication. Early Child Development and Care 2010;180(3):299-315.
66. Oosterling I, Visser J, Swinkels S, et al. Randomized controlled trial of the focus parent training for toddlers with autism: 1-year outcome. J Autism Dev Disord 2010 Dec;40(12):1447-58. PMID: 20440639.
67. Peters-Scheffer N, Didden R, Mulders M, et al. Low intensity behavioral treatment supplementing preschool services for young children with autism spectrum disorders and severe to mild intellectual disability. Res Dev Disabil 2010 Nov-Dec;31(6):1678-84. PMID: 20627451.
68. Reed P, Osborne L. Impact of Severity of Autism and Intervention Time-Input on Child Outcomes: Comparison across Several Early Interventions. British Journal of Special Education 2012;39(3):130-6.
69. Siller M, Hutman T, Sigman M. A Parent-Mediated Intervention to Increase Responsive Parental Behaviors and Child Communication in Children with ASD: A Randomized Clinical Trial. Journal of Autism and Developmental Disorders 2013;43(3):540-55.
70. Wong VCN, Kwan QK. Randomized controlled trial for early intervention for autism: A pilot study of the Autism 1-2-3 project. Journal of Autism and Developmental Disorders 2010;40(6):677-88.
71. Dawson G, Jones EJ, Merkle K, et al. Early behavioral intervention is associated with normalized brain activity in young children with autism. J Am Acad Child Adolesc Psychiatry 2012 Nov;51(11):1150-9. PMID: 23101741.
72. Dawson G, Rogers S, Munson J, et al. Randomized, Controlled Trial of an Intervention for Toddlers With Autism: The Early Start Denver Model. Pediatrics 2010 January 2010.

73. Kouijzer MEJ, de Moor JMH, Gerrits BJL, et al. Neurofeedback Improves Executive Functioning in Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders 2009 Jan;3(1):145-62.
74. Kouijzer MEJ, de Moor JMH, Gerrits BJL, et al. Long-term effects of neurofeedback treatment in autism. Research in Autism Spectrum Disorders 2009;3(2):496-501.
75. Arnold LE, Aman MG, Li X, et al. Research units of pediatric psychopharmacology (RUPP) autism network randomized clinical trial of parent training and medication: One-year follow-Up. Journal of the American Academy of Child & Adolescent Psychiatry 2012;51(11):1173-84.
76. Aman MG, McDougle CJ, Scahill L, et al. Medication and Parent Training in Children With Pervasive Developmental Disorders and Serious Behavior Problems: Results From a Randomized Clinical Trial. J Am Acad Child Adolesc Psychiatry 2009 Oct 23PMID: 19858761.
77. Farmer C, Lecavalier L, Yu S, et al. Predictors and moderators of parent training efficacy in a sample of children with autism spectrum disorders and serious behavioral problems. J Autism Dev Disord 2012 Jun;42(6):1037-44. PMID: 21822762.
78. Scahill L, McDougle CJ, Aman MG, et al. Effects of risperidone and parent training on adaptive functioning in children with pervasive developmental disorders and serious behavioral problems. J Am Acad Child Adolesc Psychiatry 2012 Feb;51(2):136-46. PMID: 22265360.
79. Kovshoff H, Hastings RP, Remington B. Two-year outcomes for children with autism after the cessation of early intensive behavioral intervention. Behav Modif 2011 Sep;35(5):427-50. PMID: 21586502.
80. Remington B, Hastings RP, Kovshoff H, et al. Early intensive behavioral intervention: outcomes for children with autism and their parents after two years. Am J Ment Retard 2007 Nov;112(6):418-38. PMID: 17963434.
81. Kasari C, Gulsrud A, Freeman S, et al. Longitudinal follow-up of children with autism receiving targeted interventions on joint attention and play. J Am Acad Child Adolesc Psychiatry 2012 May;51(5):487-95. PMID: 22525955.
82. Lawton K, Kasari C. Brief Report: Longitudinal Improvements in the Quality of Joint Attention in Preschool Children with Autism. Journal of Autism and Developmental Disorders 2012;42(2):307-12.
83. Kasari C, Paparella T, Freeman S, et al. Language outcome in autism: randomized comparison of joint attention and play interventions. J Consult Clin Psychol 2008 Feb;76(1):125-37. PMID: 18229990.
84. Kasari C, Freeman S, Paparella T. Joint attention and symbolic play in young children with autism: a randomized controlled intervention study. J Child Psychol Psychiatry 2006 Jun;47(6):611-20. PMID: 16712638.
85. Aldred C, Green J, Emsley R, et al. Mediation of treatment effect in a communication intervention for pre-school children with autism. Journal of Autism and Developmental Disorders 2012;42(3):447-54.
86. Aldred C, Green J, Adams C. A new social communication intervention for children with autism: pilot randomised controlled treatment study suggesting effectiveness. J Child Psychol Psychiatry 2004 Nov;45(8):1420-30. PMID: 15482502.

Quality/Risk of Bias Assessment Approach

Study Design

1. Did the study employ a group design?

   Group designs may include randomized controlled trials, prospective or retrospective cohorts, case-control studies

   + = yes

   - = no

2. Were the groups randomly assigned?

   + = yes

   - = no

3. Was there an appropriate comparison group?

   The comparison group should accurately represent the characteristics of the intervention group in the absence of the intervention. Specifically, factors that are likely to be associated with the intervention selected and with outcomes observed should be evenly distributed between groups, if possible. These factors may include, for example, age, IQ, severity, etc.

   + = yes

   - = no or not reported (NR)

4. If an RCT, was randomization done correctly?

   + = yes

   - = no

   NR

   NA for all non-RCTs

   Considerations:

   Was the approach to randomization described? Were random techniques like computer-generated, sequentially numbered opaque envelope used?

   Were technically non-random techniques, like alternate days of the week used?

   Any studies with randomization techniques not reported (NR) will also be reviewed by the team.

Participant Ascertainment/Inclusion

1. Was a valid diagnostic approach for ASD used within the study, or were referred participants diagnosed using a valid approach?

   A. clinical DSM-IV-based diagnosis + ADI-R and/or ADOS

B. [clinical DSM-IV-based diagnosis + other] OR [ADOS + other, such as SRS, CARS, SCQ, CAST, ASSQ, OR STAT, MCHAT for under 30 months]
C. Only clinical DSM-IV-based diagnosis OR Only ADOS
D. Neither clinical DSM-IV-based diagnosis NOR ADOS

2. Was the sample clearly characterized (e.g., information provided to characterize participants in terms of impairments associated with their ASD, such as cognitive or developmental level)?

+ = yes
- = no or not reported (NR)

Considerations:
Are baseline measures of IQ, mental age, language facility, etc. reported?
How reproducible is the study in terms of the sample participants? Do the authors provide enough information that you could recreate the study population in a new study?

3. Were inclusion and exclusion criteria clearly stated?

+ = yes
- = no or not reported (NR)

Considerations:
Did the authors report this information?

4. Do the authors report attrition?

+ = yes
- = no

Considerations:
Do they report loss to follow-up and/or drop-out?
If there is no attrition (i.e., baseline and follow up Ns are the same), score as YES

5. Were characteristics of drop-out group evaluated for differences with the participant group as a whole?

+ = yes
- = no or not reported (NR)
NA or attrition was minimal

Considerations:

Were reasons for dropping out evaluated?
Does the paper describe a comparison between drop-outs and the whole group?
Score as NA if attrition was minimal.

Intervention

1. Was the intervention fully described?

+ = yes
- = no or not reported (NR)

Considerations:
Is there sufficient detail to allow replication of the intervention?
Does the study describe the dosage, formulation, timing, duration, intensity, etc. of the intervention?
Do the authors refer to a treatment manual (score as YES if so, even is manual is unpublished)?

2. For behavioral studies, was treatment fidelity monitored in a systematic way?

+ = yes
- = no or not reported (NR)
NA

Considerations:
Was a method in place to assess whether people providing he intervention were adherent to a manual/process? We're not assessing the quality of the fidelity, just whether it was performed.

3. Did the authors measure and report adherence to the intended treatment process?

+ = yes
- = no or not reported (NR)

Considerations:
Does the study report number of hours of treatment or treatment sessions or time period receiving therapy (planned vs. actually received)? Do they provide pill count data or parental medication diary, etc. for pharmacologic interventions?

4. Did the authors report differences in or hold steady all concomitant interventions?

+ = yes

- = no or not reported (NR)

Considerations:
Was an attempt made to assess/determine if other interventions were ongoing?

Outcome Measurement

1. Did outcome measures demonstrate adequate reliability and validity (including interobserver reliability for behavior observation coding)?

+ = yes
- = no or not reported (NR)

Considerations:
If the study used an established measure, has validity been established previously and do the authors provide a reference?
If the study used a new measure, was validity established?
For interobserver coding, was reliability and /or validity tested?

2. Were the primary & secondary outcomes clearly specified a priori?

+ = yes
- = no or not reported (NR)

Considerations:
Was there a "called shot?"

3. Were outcome data collected from sources appropriate to the target outcome (e.g. parent report, teacher report, direct behavior observation)?
+ = yes
- = no or not reported (NR)

Considerations:
Ex: Parent report for home-focused outcomes, teacher report for academic/school-focused, etc.

4. Were outcomes coded by individuals blinded to the intervention status of the participants?
+ = yes
- = no or not reported (NR)

Analysis

1. Was an appropriate statistical analysis used?

+ = yes
- = no

1a. For RCT's, was there an intent-to treat analysis?
+ = yes
- = no
NA
Considerations:
Does the study report ITT analyses or last observation carried forward or note that all subjects were included in the final analyses?
If ≤2 participants were lost to follow-up, consider the analysis as ITT.

1b. For negative studies, was a power calculation provided?
+ = yes
- = no
NA

1c. Did the study correct for multiple testing?
+ = yes
- = no
NA

1d. For observational studies, were potential confounders and effect measure modifiers captured?
+ = yes
- = no
NA

Considerations:
Were the groups well categorized at baseline? Were baseline differences assessed?

1e. For observational studies, were potential confounders and effect measure modifiers handled appropriately?
+ = appropriate analysis
- = inappropriate analysis
NA

Considerations:
Confounders are variables that are associated both with the intervention and the outcome and that change the relationship of the intervention to the outcome. These are variables that we would control for in analysis.

Effect measure modifiers are variables that we think of as stratifying, in that the relationship between the intervention and outcome is fundamentally different in different strata of the effect modifier. Observational research should include an assessment of potential confounders and modifiers, and if they are observed, analysis should control for or stratify on them.
Was the candidate variable selection discussed/noted?
Was the model-building approach described?
Were any variables unrelated to the studied variables that could have altered the outcome handled appropriately?
Were any variables not under study that affected the causal factors handled appropriately?

Appendix E. Excluded Studies

Exclusion reasons:

X-1 Participants not in target age range
X-2 Not original research
X-3 Study size (N<10)
X-4 Does not address Key Questions
X-5 Does not address behavioral intervention for children with ASD 0-12 years of age
X-6 Article not obtainable

1. Brasic JR, Gianutsos JG. Neuromotor Assessment and Autistic Disorder. 2000. p. 287-98. X-4
2. Carr D, Felce D. Application of Stimulus Equivalence to Language Intervention for Individuals with Severe Linguistic Disabilities. 2000. p. 181-205. X-4
3. Carr JE, Nicolson AC, Higbee TS. Evaluation of a brief multiple-stimulus preference assessment in a naturalistic context. Journal of Applied Behavior Analysis. 2000;33(3):353-7. X-3, X-5
4. Chez MG, Buchanan CP. Reply to B. Rimland's "Comments on 'Secretin and Autism: A Two-Part Clinical Investigation"'. Journal of Autism and Developmental Disorders. 2000;30(2):97-8. X-5
5. Ernst M. Commentary: Considerations on the Characterization and Treatment of Self-Injurious Behavior. Journal of Autism and Developmental Disorders. 2000;30(5):447-50. X-2, X-5
6. Feinberg E, Vacca J. The Drama and Trauma of Creating Policies on Autism: Critical Issues To Consider in the New Millennium. Focus on Autism and Other Developmental Disabilities. 2000;15(3):130-7. X-5
7. Geckeler AS, Libby ME, Graff RB, et al. Effects of reinforcer choice measured in single-operant and concurrent-schedule procedures. Journal of Applied Behavior Analysis. 2000;33(3):347-51. X-3, X-5
8. Goldstein H. Commentary: Interventions To Facilitate Auditory, Visual, and Motor Integration: "Show Me the Data". Journal of Autism and Developmental Disorders. 2000;30(5):423-5. X-2, X-5
9. Gringras P. Practical Paediatric Psychopharmacological Prescribing in Autism: The Potential and the Pitfalls. 2000. p. 229-47. X-4
10. Horská A, Naidu S, Herskovits EH, et al. Quantitative 1H MR spectroscopic imaging in early Rett syndrome. Neurology. 2000;54(3):715-22. X-5
11. Johnston MV. Commentary: Potential Neurobiologic Mechanisms through Which Metabolic Disorders Could Relate to Autism. Journal of Autism and Developmental Disorders. 2000;30(5):471-3. X-2, X-5
12. Kaiser AP, Hancock TB, Nietfeld JP. The Effects of Parent-Implemented Enhanced Milieu Teaching on the Social Communication of Children Who Have Autism. Early Education and Development. 2000;11(4):423-46. X-3
13. Kennedy CH, Meyer KA, Knowles T, et al. Analyzing the multiple functions of stereotypical behavior for students with autism: Implications for assessment and treatment. Journal of Applied Behavior Analysis. 2000;33(4):559-71. X-5
14. Kerr KP, Mulhern F, McDowell C. Applied Behaviour Analysis. It Works, It's Positive; Now What's the Problem? Early Child Development and Care. 2000;163:125-31. X-6
15. Maag JW, Katsiyannis A. Recent Legal and Policy Developments in Special Education. NASSP Bulletin. 2000;84(613):1-8. X-5
16. Mallory BL, Erickson K. "Play and Imagination in Children with Autism," by Pamela J. Wolfberg. Book Review. Early Childhood Research Quarterly. 2000;15(4):583-6. X-5
17. Miller N, Neuringer A. Reinforcing variability in adolescents with autism. Journal of Applied Behavior Analysis. 2000;33(2):151-65. X-5
18. Moore D, Taylor J. Interactive Multimedia Systems for Students with Autism. Journal of Educational Media. 2000;25(3):169-77. X-1, X-2, X-3, X-4
19. Nind M, Powell S. Intensive Interaction and Autism: Some Theoretical Concerns. Children & Society. 2000;14(2):98-109. X-5
20. Pomeranz K. Siegel's defense: More inaccuracies. Journal of Autism and Developmental Disorders. 2000;30(4):363. X-2, X-5
21. Rimland B. Comments on "Secretin and Autism: A Two-Part Clinical Investigation" by M. G. Chez et al. Journal of Autism and Developmental Disorders. 2000 2000;30(2):95. X-1, X-2, X-3, X-4, X-5

22. Sallows G. Educational Interventions for Children with Autism in the UK. Early Child Development and Care. 2000;163:25-47. X-6
23. Tantam D. Psychological Disorder in Adolescents and Adults with Asperger Syndrome. Autism: The International Journal of Research and Practice. 2000;4(1):47-62. X-5
24. Tsai L. Children with Autism Spectrum Disorder: Medicine Today and in the New Millennium. Focus on Autism and Other Developmental Disabilities. 2000;15(3):138-45. X-2, X-5
25. Wray JA, Yoon JH, Vollmer T, et al. Pilot study of the behavioral effects of flumazenil in two children with autism. Journal of Autism and Developmental Disorders. 2000;30(6):619-20. X-3
26. Yell ML, Drasgow E. Litigating a Free Appropriate Public Education: The Lovaas Hearings and Cases. 2000. p. 205-14. X-4
27. Charman T, Baron-Cohen S, Baird G, et al. Commentary: The Modified Checklist for Autism in Toddlers. Journal of Autism and Developmental Disorders. 2001;31(2):145-8. X-5
28. Chen NC, Bedair HS, McKay B, et al. Clozapine in the treatment of aggression in an adolescent with autistic disorder. Journal of Clinical Psychiatry. 2001;62(6):479-80. X-5
29. Clifford P, Friesen S, Jardine DW. Whatever Happens to Him Happens to Us: Reading Coyote Reading the World. Journal of Educational Thought/Revue de la Pensee Educative. 2001;35(1):9-26. X-5
30. Dempsey I, Foreman P. A Review of Educational Approaches for Individuals with Autism. 2001. p. 103-16. X-4
31. Dunlap G, Kern L, Worcester J. ABA and Academic Instruction. Focus on Autism and Other Developmental Disabilities. 2001;16(2):129-36. X-1, X-2, X-3, X-4
32. Dunlap G, Newton SJ, Fox L, et al. Family Involvement in Functional Assessment and Positive Behavior Support. 2001. p. 215-21. X-4
33. Durand MV, Merges E. Functional Communication Training: A Contemporary Behavior Analytic Intervention for Problem Behaviors. 2001. p. 110-9. X-4
34. Earles-Vollrath TL. Book Review: Teaching Kids and Adults with Autism: Building the Framework for Lifetime Learning. Focus on Autism and Other Developmental Disabilities. 2001;16(1):64. X-5
35. Gobbi G, Pulvirenti L. Long-term treatment with clozapine in an adult with autistic disorder accompanied by aggressive behavior. Journal of Psychiatry & Neuroscience. 2001;26(4):340-1. X-5
36. Gorbachevskaya N, Bashina V, Gratchev V, et al. Cerebrolysin therapy in Rett syndrome: Clinical and EEG mapping study. Brain & Development. 2001;23(Suppl1):S90-S3. X-5
37. Johnston SS, O'Neill RE. Searching for Effectiveness and Efficiency in Conducting Functional Assessments: A Review and Proposed Process for Teachers and Other Practitioners. 2001. p. 205-14. X-4
38. Koegel LK, Koegel RL, Frea WD, et al. Identifying early intervention targets for children with autism in inclusive school settings. Behavior Modification. 2001;25(5):745-61. X-3, X-5
39. Kohler FW, Anthony LJ, Steighner SA, et al. Teaching Social Interaction Skills in the Integrated Preschool: An Examination of Naturalistic Tactics. Topics in Early Childhood Special Education. 2001;21(2):93-103. X-3
40. Koning C, Magill-Evans J. Validation of the Child and Adolescent Social Perception Measure. Occupational Therapy Journal of Research. 2001;21(1):49-67. X-5
41. Mueller MM, Wilczynski SM, Moore JW, et al. Antecedent manipulations in a tangible condition: Effects of stimulus preference on aggression. Journal of Applied Behavior Analysis. 2001;34(2):237-40. X-3, X-5
42. Ogletree BT, Oren T. Application of ABA Principles to General Communication Instruction. 2001. p. 102-9. X-2, X-4
43. Roane HS, Piazza CC, Sgro GM, et al. Analysis of aberrant behaviour associated with Rett syndrome. Disability and Rehabilitation: An International, Multidisciplinary Journal. 2001;23(3-4):139-48. X-5
44. Robins DL, Fein D, Barton ML, et al. The Modified Checklist for Autism in Toddlers: An initial study investigating the early detection of autism and pervasive developmental disorders. Journal of Autism and Developmental Disorders. 2001;31(2):131-44. X-5
45. Robins DL, Fein D, Barton ML, et al. Reply to Charman et al.'s Commentary on the Modified Checklist for Autism in Toddlers. Journal of Autism and Developmental Disorders. 2001 2001;31(2):149-51. X-5
46. Rogers EL. Functional Behavioral Assessment and Children with Autism: Working as a Team. Focus on Autism and Other Developmental Disabilities. 2001;16(4):228-31. X-1, X-2, X-3, X-4
47. Rogers MF, Myles BS. Using Social Stories and Comic Strip Conversations To Interpret Social Situations for an Adolescent with Asperger Syndrome. 2001. p. 310-3. X-4
48. Roseman B, Schneider E, Crimmins D, et al. What to measure in autism drug trials. Journal of Autism and Developmental Disorders. 2001;31(3):361-2. X-5

49. Rosinski D. The Miraculous and the Mundane. Focus on Autism and Other Developmental Disabilities. 2001;16(1):12-6. X-5
50. Safran SP. Asperger Syndrome: The Emerging Challenge to Special Education. 2001. p. 151-60. X-4
51. Schneiter R, Devine MA. Reduction of Self-Injurious Behaviors of an Individual with Autism: Use of a Leisure Communication Book. Therapeutic Recreation Journal. 2001;35(3):207-19. X-5
52. Schwartz IS, Boulware G-L, McBride BJ, et al. Functional Assessment Strategies for Young Children with Autism. Focus on Autism and Other Developmental Disabilities. 2001;16(4):222-7. X-1, X-2, X-3, X-4
53. Simpson RL. ABA and Students with Autism Spectrum Disorders: Issues and Considerations for Effective Practice. Focus on Autism and Other Developmental Disabilities. 2001 2001;16(2):68-71. X-5
54. Starr EM, Foy JB, Cramer KM. Parental Perceptions of the Education of Children with Pervasive Developmental Disorders. Education and Training in Mental Retardation and Developmental Disabilities. 2001;36(1):55-68. X-5
55. Symons FJ, Clark RD, Roberts JP, et al. Classroom Behavior of Elementary School-Age Boys with Fragile X Syndrome. Journal of Special Education. 2001;34(4):194-202. X-5
56. Yasuhara A, Sugiyama Y. Music therapy for children with Rett syndrome. Brain & Development. 2001;23(Suppl1):S82-S4. X-5
57. Beatson JE, Prelock PA. The Vermont Rural Autism Project: Sharing experiences, shifting attitudes. Focus on Autism and Other Developmental Disabilities. 2002;17(1):48-54. X-3, X-4, X-5
58. Bibby P, Eikeseth S, Martin NT, et al. "Progress and outcomes for children with autism receiving parent-managed intensive interventions": Erratum. Research in Developmental Disabilities. 2002;23(1):79-104. X-5
59. Carr JE, Dozier CL, Patel MR, et al. Treatment of Automatically Reinforced Object Mouthing with Noncontingent Reinforcement and Response Blocking: Experimental Analysis and Social Validation. Research in Developmental Disabilities. 2002;23(1):37-44. X-3
60. Davis BJ, Smith T, Donahoe P. Evaluating supervisors in the UCLA treatment model for children with autism: Validation of an assessment procedure. Behavior Therapy. 2002;33(4):601-14. X-4, X-5
61. Dunn W, Saiter J, Rinner L. Asperger Syndrome and Sensory Processing: A Conceptual Model and Guidance for Intervention Planning. 2002. p. 172-85. X-4
62. Fiumara A, Polizzi A, Mazzei R, et al. Rett syndrome phenotype following infantile acute encephalopathy. Journal of Child Neurology. 2002;17(9):700-2. X-5
63. Freeden I. A troll in the consulting room. British Journal of Psychotherapy. 2002;19(2):189-202. X-5
64. Garfinkle AN, Schwartz IS. Peer imitation: Increasing social interactions in children with autism and other developmental disabilities in inclusive preschool classrooms. Topics in Early Childhood Special Education. 2002;22(1):26-38. X-3
65. Goldstein H. Communication Intervention for Children with Autism: A Review of Treatment Efficacy. 2002. p. 373-96. X-4
66. Hagiwara T. Academic Assessment of Children and Youth with Asperger Syndrome, Pervasive Developmental Disorders-Not Otherwise Specified, and High-Functioning Autism. 2002. X-3, X-4
67. Jensen VK, Sinclair LV. Treatment of Autism in Young Children: Behavioral Intervention and Applied Behavior Analysis. Infants and Young Children. 2002;14(4):42-52. X-2, X-5
68. Kerr KP, Campbell A, McGrory S. The Saplings Model of Education: Case Studies in Autism. Journal of Precision Teaching & Celeration. 2002;18(2):49-60. X-5
69. Lee R, McComas JJ, Jawor J. The effects of differential and lag reinforcement schedules on varied verbal responding by individuals with autism. Journal of Applied Behavior Analysis. 2002;35(4):391-402. X-3
70. Levy SE, Hyman SL. Alternative/Complementary Approaches to Treatment of Children with Autism Spectrum Disorders. 2002. p. 33-42. X-2, X-3, X-4
71. Madsen KM, Hviid A, Vestergaard M, et al. A population-based study of measles, mumps, and rubella vaccination and autism. The New England Journal of Medicine. 2002;347(19):1477-82. X-5
72. Mandlawitz MR. The Impact of the Legal System on Educational Programming for Young Children with Autism Spectrum Disorder. 2002. p. 495-508. X-4
73. McConnell SR. Interventions To Facilitate Social Interaction for Young Children with Autism: Review of Available Research and Recommendations for Educational Intervention and Future Research. 2002. p. 351-72. X-4
74. McElwee J, Munson S. Attaining Fluency by a Youngster with Autism for a Beginning Listener Skill. Journal of Precision Teaching & Celeration. 2002;18(1):30-2. X-3, X-5
75. Niederhofer H, Staffen W, Mair A. Lofexidine in hyperactive impulsive children with autistic disorder. Journal of the American Academy of Child & Adolescent Psychiatry. 2002;41(12):1396-7. X-5

76. Osterling JA, Dawson G, Munson JA. Early recognition of 1-year-old infants with autism spectrum disorder versus mental retardation. Development and Psychopathology. 2002;14(2):239-51. X-5
77. Ruble LA, Dalrymple NJ. COMPASS: A Parent-Teacher Collaborative Model for Students with Autism. Focus on Autism and Other Developmental Disabilities. 2002;17(2):76-83. X-2, X-3, X-5
78. Schall C. A Consumer's Guide to Monitoring Psychotropic Medication for Individuals with Autism Spectrum Disorders. 2002. p. 229-35. X-4
79. Research into Early Intervention for Children with Autism and Related Disorders: Methodological and Design Issues: Report on a Workshop Funded by the Wellcome Trust, Institute of Child Health, London, UK, November 2001. 2003. p. 217-25. X-4
80. Able-Boone H, Crais ER, Downing K. Preparation of Early Intervention Practitioners for Working with Young Children with Low Incidence Disabilities. Teacher Education and Special Education. 2003;26(1):79-82. X-5
81. Antshel KM, Remer R. Social Skills Training in Children With Attention Deficit Hyperactivity Disorder: A Randomized-Controlled Clinical Trial. J Clin Child Adolesc Psychol. 2003;32(1):152-65. PMID: 12573940; X-5
82. Bruns DA, Gallagher EA. Having Their Piece of the PIIE: Promoting the Communicative Behaviors of Young Children with Autism/PDD. 2003. p. 20-7. X-3, X-4
83. Campbell JM. Efficacy of Behavioral Interventions for Reducing Problem Behavior in Persons with Autism: A Quantitative Synthesis of Single-Subject Research. Research in Developmental Disabilities. 2003 2003;24(2):120-38. X-1
84. Connor M. Monitoring and Reviewing Early Behavioural Intervention in Autism (Lovaas). Routledge. , 325 Chestnut Street Suite 800, Philadelphia, PA 19106.; 2003. p. 21-33. X-4
85. Craven-Thuss B, Nicolson R. Amoxapine treatment of interfering behaviors in autistic disorder. Journal of the American Academy of Child & Adolescent Psychiatry. 2003;42(5):515-6. X-3
86. Dahle KB. Services To Young Children with Autism in the General Classroom. 2003. p. 65-70. X-4
87. Dahle KB. The Clinical and Educational Systems: Differences and Similarities. 2003. p. 238-46. X-4
88. Diehl SF. Epilogue: Autism Spectrum Disorder: The Context of Speech-Language Pathologist Intervention. Language, Speech, and Hearing Services in Schools. 2003;34(3):253-4. X-5
89. Diehl SF. The SLP's Role in Collaborative Assessment and Intervention for Children with ASD. 2003. p. 95-115. X-4
90. Gale S, Ozonoff S, Lainhart J. Brief Report: Pitocin Induction in Autistic and Nonautistic Individuals. Journal of Autism and Developmental Disorders. 2003;33(2):205-8. X-5
91. Glaeser BC, Pierson MR, Fritschmann N. Comic Strip Conversation: A Positive Behavioral Support Strategy. 2003. p. 14-9. X-3
92. Goforth HW, Rao M. Improvement in behaviour and attention in an autistic patient treated with ziprasidone. Australian and New Zealand Journal of Psychiatry. 2003;37(6):775-6. X-3
93. Hess K. Keep the Change: A Hard-Earned Success. Young Children. 2003;58(4):30-2. X-3, X-5
94. Hviid A, Stellfeld M, Wohlfahrt J, et al. Association Between Thimerosal-Containing Vaccine and Autism. JAMA: Journal of the American Medical Association. 2003;290(13):1763-6. X-5
95. Kerr AM, Webb P, Prescott RJ, et al. Results of Surgery for Scoliosis in Rett Syndrome. Journal of Child Neurology. 2003;18(10):703-8. X-5
96. Koppenhaver DA, Erickson KA. Natural emergent literacy supports for preschoolers with Autism and severe communication impairments. Topics in Language Disorders. 2003;23(4):283-92. X-3
97. Mahoney G, Perales F. Using Relationship-Focused Intervention To Enhance the Social-Emotional Functioning of Young Children with Autism Spectrum Disorders. Topics in Early Childhood Special Education. 2003 2003;23(2):77-89. X-5
98. McCabe H. The Beginnings of Inclusion in the People's Republic of China. Research and Practice for Persons with Severe Disabilities. 2003 2003;28(1):16-22. X-5
99. Moore V, Goodson S. How well does early diagnosis of autism stand the test of time? Follow-up study of children assessed for autism at age 2 and development of an early diagnostic service. Autism. 2003;7(1):47-63. X-5
100. Nasuno M, Takeuchi K, Yamamoto J-i. Feasibility of Parents of Children with Autism Using an Applied Behavior Analytic Early Treatment Program: A Preliminary Study in Malaysia. Japanese Journal of Special Education. 2003;40(6):723-32. X-1, X-3, X-4
101. Nelson C, Huefner DS. Young Children with Autism: Judicial Responses to the Lovaas and Discrete Trial Training Debates. 2003. p. 1-19. X-4
102. Niederhofer H, Staffen W, Mair A. Immunoglobulins as an alternative strategy of psychopharmacological treatment of children with autistic disorder. Neuropsychopharmacology. 2003;28(5):1014-5. X-5

103. Odom SL, Brown WH, Frey T, et al. Evidence-Based Practices for Young Children with Autism: Contributions for Single-Subject Design Research. 2003. p. 166-75. X-2, X-3
104. Oh HM, Oh JM, Choi SC, et al. An efficient method for the rapid establishment of Epstein-Barr virus immortalization of human B lymphocytes. Cell Prolif. 2003 Aug;36(4):191-7. PMID: 12950388; X-5
105. Osborne J. Art and the Child with Autism: Therapy or Education? ; 2003. p. 411-23. X-4
106. Polirstok SR, Dana L, Buono S, et al. Improving functional communication skills in adolescents and young adults with severe autism using gentle teaching and positive approaches. Topics in Language Disorders. 2003;23(2):146-53. X-5
107. Polirstok SR, Lesser DR. Useful Online Information, Resources, and Interventions for Speech Language Pathologists and Teachers of Students with Autistic Spectrum Disorders. Topics in Language Disorders. 2003;23(2):166-7. X-5
108. Prizant BM, Wetherby AM, Rubin E, et al. The SCERTS Model: A Transactional, Family-Centered Approach to Enhancing Communication and Socioemotional Abilities of Children with Autism Spectrum Disorder. Infants and Young Children. 2003;16(4):296-316. X-1, X-2, X-3, X-4
109. Roane HS, Fisher WW, McDonough EM. Progressing from programmatic to discovery research: A case example with the overjustification effect. Journal of Applied Behavior Analysis. 2003;36(1):35-46. X-5
110. Rogers-Adkinson DL, Ochoa TA, Delgado B. Developing Cross-Cultural Competence: Serving Families of Children with Significant Developmental Needs. 2003. p. 4-8. X-4
111. Safran SP, Safran JS, Ellis K. Intervention ABCs for Children with Asperger Syndrome. 2003. p. 154-65. X-4
112. Tissot C, Evans R. Visual Teaching Strategies for Children with Autism. Early Child Development and Care. 2003;173(4):425-33. X-1, X-2, X-3, X-4
113. Webster A, Feiler A, Webster V. Early Intensive Family Intervention and Evidence of Effectiveness: Lessons from the South West Autism Programme. 2003. p. 383-98. X-4
114. Woods JJ, Wetherby AM. Early Identification of and Intervention for Infants and Toddlers Who Are at Risk for Autism Spectrum Disorder. 2003. p. 180-93. X-2, X-3, X-4
115. Zionts LT, Zionts P, Harrison S, et al. Urban African American Families' Perceptions of Cultural Sensitivity within the Special Education System. Focus on Autism and Other Developmental Disabilities. 2003;18(1):41-50. X-5
116. Barnes-Holmes Y, Barnes-Holmes D, McHugh L. Teaching Derived Relational Responding to Young Children. Journal of Early and Intensive Behavior Intervention. 2004;1(1):3-12. X-1, X-2, X-3, X-4
117. Bodfish JW. Treating the Core Features of Autism: Are We There yet? Mental Retardation and Developmental Disabilities Research Reviews. 2004;10(4):318-26. X-1, X-2, X-3, X-4
118. Bölte S, Bosch G. Bosch's Cases: A 40 years Follow-up of Patients with Infantile Autism and Asperger Syndrome. German Journal of Psychiatry. 2004;7(1):10-3. X-5
119. Bruinsma Y, Koegel RL, Koegel LK. Joint Attention and Children with Autism: A Review of the Literature. Wiley-Blackwell. 111 River Street, Hoboken, NJ 07030-5774.; 2004. p. 169-75. X-4
120. Bryson SE, Landry R, Czapinski P, et al. Autistic Spectrum Disorders: Causal Mechanisms and Recent Findings on Attention and Emotion. International Journal of Special Education. 2004;19(1):14-22. X-5
121. Carpenter B, Addenbrooke M, Attfield E, et al. Celebrating Families: An Inclusive Model of Family-Centred Training. British Journal of Special Education. 2004;31(2):75-80. X-5
122. Chen W, Landau S, Sham P, et al. No evidence for links between autism, MMR and measles virus. Psychological Medicine. 2004;34(3):543-53. X-5
123. Dong WK, Greenough WT. Plasticity of Nonneuronal Brain Tissue: Roles in Developmental Disorders. Mental Retardation and Developmental Disabilities Research Reviews. 2004;10(2):85-90. X-5
124. Drash PW, Tudor RM. An Analysis of Autism as a Contingency-Shaped Disorder of Verbal Behavior. Analysis of Verbal Behavior. 2004;20:5-23. X-5
125. Drash PW, Tudor RM. Is Autism a Preventable Disorder of Verbal Behavior? A Response to Five Commentaries. Analysis of Verbal Behavior. 2004 2004;20:55-62. X-5
126. Goldsmith TR, LeBlanc LA. Use of Technology in Interventions for Children with Autism. Journal of Early and Intensive Behavior Intervention. 2004;1(2):166-78. X-1, X-2, X-3, X-4
127. Goyal M, O'Riordan MA, Wiznitzer M. Effect of Topiramate on Seizures and Respiratory Dysrhythmia in Rett Syndrome. Journal of Child Neurology. 2004;19(8):588-91. X-5
128. Haines J, Camarata S. Examination of Candidate Genes in Language Disorder: A Model of Genetic Association for Treatment Studies. Mental Retardation and Developmental Disabilities Research Reviews. 2004;10(3):208-17. X-5

129. Himle MB, Miltenberger RG, Flessner C, et al. Teaching safety skills to children to prevent gun play. Journal of Applied Behavior Analysis. 2004;37(1):1-9. X-3, X-5
130. Hixson MD. Autism as a Contingency-Shaped Disorder of Verbal Behavior: Evidence Obtained and Evidence Needed. Analysis of Verbal Behavior. 2004;20:49-53. X-2, X-5
131. Houzel D. The Psychoanalysis of Infantile Autism. Journal of Child Psychotherapy. 2004 2004;30(2):225-37. X-3, X-5
132. Icasiano F, Hewson P, Machet P, et al. Childhood autism spectrum disorder in the Barwon region: A community based study. Journal of Paediatrics and Child Health. 2004;40(12):696-701. X-5
133. Kaidar M, Zalsman G. Olanzapine for Childhood Disintegrative Disorder. Israel Journal of Psychiatry and Related Sciences. 2004;41(1):71-2. X-1, X-2, X-3, X-4
134. Kwon H. Tardive dyskinesia in an autistic patient treated with risperidone. The American Journal of Psychiatry. 2004;161(4):757-8. X-5
135. Malow BA. Sleep Disorders, Epilepsy, and Autism. Mental Retardation and Developmental Disabilities Research Reviews. 2004;10(2):122-5. X-2, X-5
136. Noland RM, Gabriels RL. Screening and Identifying Children with Autism Spectrum Disorders in the Public School System: The Development of a Model Process. Journal of Autism and Developmental Disorders. 2004;34(3):265-77. X-5
137. Nuzzolo-Gomez R, Greer DR. Emergence of Untaught Mands or Tacts of Novel Adjective-Object Pairs as a Function of Instructional History. Analysis of Verbal Behavior. 2004;20:63-76. X-3
138. Reading R. Review of Age at first measles-mumps-rubella vaccination in children with autism and school-matched control subjects: A population-based study in metropolitan Atlanta. Child: Care, Health and Development. 2004;30(4):398-9. X-5
139. Renna R. Autism spectrum disorders Learning to Listen as We Shape Behaviors Blending Choice Theory with Applied Behavioral Analysis. International Journal of Reality Therapy. 2004;23(2):17-22. X-2, X-5
140. Schwartz IS, Sandall SR, McBride BJ, et al. Project DATA (Developmentally Appropriate Treatment for Autism): An Inclusive School-Based Approach to Educating Young Children with Autism. Topics in Early Childhood Special Education. 2004;24(3):156-68. X-5
141. Smeeth L, Cook C, Fombonne E, et al. MMR vaccination and pervasive developmental disorders: A case-control study. The Lancet. 2004;364(9438):963-9. X-5
142. Smith C, Goddard S, Fluck M. A Scheme to Promote Social Attention and Functional Language in Young Children with Communication Difficulties and Autistic Spectrum Disorder. Educational Psychology in Practice. 2004;20(4):319-33. X-3, X-4
143. Smith DL, Gillon GT. Autistic Spectrum Disorder: Caseload Characteristics, and Interventions Implemented by Speech-Language Therapists. Kairaranga. 2004;5(2):46-54. X-1, X-2, X-3, X-4
144. Sulzbacher S, Mas J, Larson EH, et al. Pediatric Tele-Health Consultation to Rural Schools and Clinics in the Pacific Northwest. Journal of Special Education Technology. 2004;19(1):35-42. X-5
145. Summers AJ, Houlding MC, Reitzel MJA. Behaviour Management Services for Children with Autism-PDD: Program Description and Patterns of Referral. Focus on Autism and Other Developmental Disabilities. 2004;19(2):95-101. X-4
146. Taylor BA, Hughes CE, Richard E, et al. Teaching Teenagers with Autism to Seek Assistance when Lost. Journal of Applied Behavior Analysis. 2004;37(1):79-82. X-5
147. Tharp BR. Epileptic Encephalopathies and Their Relationship to Developmental Disorders: Do Spikes Cause Autism? Mental Retardation and Developmental Disabilities Research Reviews. 2004;10(2):132-4. X-2, X-5
148. Tuchman R. AEDS and Psychotropic Drugs in Children with Autism and Epilepsy. Mental Retardation and Developmental Disabilities Research Reviews. 2004 May 2004;10(2):135-8. X-5
149. Waltz M, Shattock P. Autistic disorder in nineteenth-century London. Autism. 2004;8(1):7-20. X-3, X-5
150. Woo EJ, Ball R, Bostrom A, et al. Vaccine Risk Perception Among Reporters of Autism After Vaccination: Vaccine Adverse Event Reporting System 1990-2001. American Journal of Public Health. 2004;94(6):990-55. X-5
151. Yang P, Tsai J-H. Occurrence of Priapism with Risperidone-Paroxetine Combination in an Autistic Child. Journal of Child and Adolescent Psychopharmacology. 2004;14(3):342-3. X-5
152. Carr JE, Firth AM. The Verbal Behavior Approach to Early and Intensive Behavioral Intervention for Autism: A Call for Additional Empirical Support. Journal of Early and Intensive Behavior Intervention. 2005;2(1):18-27. X-2, X-5
153. Clark E, Zhou Z. Autism in China: From Acupuncture to Applied Behavior Analysis. Psychology in the Schools. 2005;42(3):285-95. X-5

154. Cohen MJ. The effect of increasing the rate of clerical skill performance on challenging behavior. Journal of Precision Teaching & Celeration. 2005;21(1):2-12. X-5
155. Corbett BA, Abdullah M. Video Modeling: Why Does It Work for Children with Autism? Journal of Early and Intensive Behavior Intervention. 2005;2(1):2-8. X-2, X-5
156. DeRosier ME, Marcus SR. Building friendships and combating bullying: effectiveness of S.S.GRIN at one-year follow-up. J Clin Child Adolesc Psychol. 2005 Mar;34(1):140-50. PMID: 15677288; X-5
157. Doughty SS, Poe SG, Anderson CM. Effects of Punishment and Response-Independent Attention on Severe Problem Behavior and Appropriate Toy Play. Journal of Early and Intensive Behavior Intervention. 2005;2(2):91-8. X-3
158. Dumont-Mathieu T, Fein D. Screening for Autism in Young Children: The Modified Checklist for Autism in Toddlers (M-Chat) and Other Measures. Mental Retardation and Developmental Disabilities Research Reviews. 2005;11(3):253-62. X-5
159. Easterbrooks RS, Handley MC. Behavior Change in a Student with a Dual Diagnosis of Deafness and Pervasive Development Disorder: A Case Study. American Annals of the Deaf. 2005;150(5):401-7. X-3, X-5
160. Elefant C, Wigram T. Learning ability in children with Rett syndrome. Brain & Development. 2005;27(Suppl1):S97-S101. X-5
161. Ferraioli S, Hughes C, Smith T. A Model for Problem Solving in Discrete Trial Training for Children with Autism. Journal of Early and Intensive Behavior Intervention. 2005;2(4):224-46. X-2, X-5
162. Galinat K, Barcalow K, Krivda B. Caring for Children with Autism in the School Setting. Journal of School Nursing. 2005;21(4):208-17. X-5
163. Groden J, Goodwin MS, Baron MG, et al. Assessing Cardiovascular Responses to Stressors in Individuals With Autism Spectrum Disorders. Focus on Autism and Other Developmental Disabilities. 2005;20(4):244-52. X-5
164. Handleman JS, Harris SL. Douglass Developmental Disabilities Center: An ABA Program for Children and Adults with Autism Spectrum Disorders. International Journal of Behavioral Consultation and Therapy. 2005;1(4):301-11. X-2, X-3, X-4
165. Hay I, Winn S. Students with Asperger's Syndrome in an Inclusive Secondary School Environment: Teachers', Parents', and Students' Perspectives. Australasian Journal of Special Education. 2005;29(2):140-54. X-3, X-4
166. Kraemer B, Delsignore A, Gundelfinger R, et al. Comorbidity of Asperger syndrome and gender identity disorder. European Child & Adolescent Psychiatry. 2005;14(5):292-6. X-5
167. Leblanc L, Richardson W, McIntosh J. The Use of Applied Behavioral Analysis in Teaching Children with Autism. International Journal of Special Education. 2005;20(1):13-34. X-3
168. Lerman DC, Parten M, Addison LR, et al. A Methodology for Assessing the Functions of Emerging Speech in Children with Developmental Disabilities. Journal of Applied Behavior Analysis. 2005;38(3):303-16. X-5
169. McInnes LA, González PJ, Manghi ER, et al. A genetic study of autism in Costa Rica: Multiple variables affecting IQ scores observed in a preliminary sample of autistic cases. BMC Psychiatry. 2005. X-5
170. Mukaddes NM, Topcu Z. Letter to the editors. Autism. 2005;9(2):213-5. X-5
171. Noto LA. A Case Study of the Ann Sullivan Center in Lima, Peru. International Journal of Special Education. 2005;20(2):47-57. X-2, X-3, X-4
172. Rapp JT, Rapp J. Stereotypy II: A Review of Neurobiological Interpretations and Suggestions for an Integration with Behavioral Methods. Elsevier Customer Service Department, 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2005. p. 548-64. X-4
173. Romanczyk RG, White S, Gillis JM. Social Skills versus Skilled Social Behavior: A Problematic Distinction in Autism Spectrum Disorders. Journal of Early and Intensive Behavior Intervention. 2005;2(3):177-93. X-1, X-2, X-3, X-4
174. Ronald A, Happé F, Plomin R. The genetic relationship between individual differences in social and nonsocial behaviours characteristic of autism. Developmental Science. 2005;8(5):444-58. X-5
175. Stephens CE. Overcoming Challenges and Identifying a Consensus about Autism Intervention Programming. International Journal of Special Education. 2005 2005;20(1):35-49. X-5
176. Trepagnier CY, Sebrechts MM, Finkelmeyer A, et al. Virtual environments to address autistic social deficits. Annual Review of CyberTherapy and Telemedicine. 2005;3:101-7. X-1, X-2, X-3, X-4
177. Tucci V, Hursh D, Laitinen R, et al. Competent Learner Model for Individuals With Autism/PDD. Exceptionality. 2005;13(1):55-63. X-5
178. Weinberg M. Creation of a Commission for Accreditation of Programs and Services Using Applied Behavior Analysis for Treatment Purposes. International Journal of Behavioral Consultation and Therapy. 2005;1(4):338-40. X-5

179. Williams G, Perez-Gonzalez LA, Queiroz ABM. Using a Combined Blocking Procedure to Teach Color Discrimination to a Child with Autism. Journal of Applied Behavior Analysis. 2005;38(4):555-8. X-3
180. Ali S, Frederickson N. Investigating the Evidence Base of Social Stories. Educational Psychology in Practice. 2006;22(4):355-77. X-1, X-2, X-3, X-4
181. Banerjee M. Autism & communication—A psycho-bio-social approach. Indian Journal of Community Psychology. 2006;2(2):1-15. X-6
182. Baranek GT, David FJ, Poe MD, et al. Sensory Experiences Questionnaire: discriminating sensory features in young children with autism, developmental delays, and typical development. Journal of Child Psychology and Psychiatry. 2006;47(6):591-601. X-5
183. Barretto A, Wacker DP, Harding J, et al. Using Telemedicine to Conduct Behavioral Assessments. Journal of Applied Behavior Analysis. 2006;39(3):333-40. X-5
184. Brock SE. An Examination of the Changing Rates of Autism in Special Education. California School Psychologist. 2006;11:31-40. X-5
185. Caldwell P. Speaking the Other's Language: Imitation as a Gateway to Relationship. Infant and Child Development. 2006;15(3):275-82. X-5
186. Carlson JS, Brinkman T, Majewicz-Hefley A. Medication Treatment Outcomes for School-Aged Children Diagnosed with Autism. California School Psychologist. 2006;11:21-30. X-1, X-2, X-3, X-4
187. Eaves LC, Wingert H, Ho HH. Screening for autism: Agreement with diagnosis. Autism. 2006;10(3):229-42. X-5
188. Fish WW. Perceptions of Parents of Students with Autism towards the IEP Meeting: A Case Study of One Family Support Group Chapter. Education. 2006;127(1):56-68. X-5
189. Huang AX, Wheeler JJ. Effective Interventions for Individuals with High-Functional Autism. International Journal of Special Education. 2006 2006;21(3):165-75. X-5
190. Humphrey N, Parkinson G. Research on Interventions for Children and Young People on the Autistic Spectrum: A Critical Perspective. Journal of Research in Special Educational Needs. 2006;6(2):76-86. X-2, X-5
191. Jones P, West E, Stevens D. Nurturing Moments of Transformation in Teachers--Comparative Perspectives on the Challenges of Professional Development. British Journal of Special Education. 2006;33(2):82-90. X-5
192. Landa R, Garrett-Mayer E. Development in Infants with Autism Spectrum Disorders: A Prospective Study. Journal of Child Psychology and Psychiatry. 2006;47(6):629-38. X-5
193. Lerman DC, Addison LR, Kodak T. A Preliminary Analysis of Self-Control with Aversive Events: The Effects of Task Magnitude and Delay on the Choices of Children with Autism. Journal of Applied Behavior Analysis. 2006;39(2):227-32. X-3
194. Margetts JK, Le Couteur A, Croom S. Families in a state of flux: The experience of grandparents in autism spectrum disorder. Child: Care, Health and Development. 2006;32(5):565-74. X-5
195. Meadan H, Halle JW, Watkins RV, et al. Examining Communication Repairs of 2 Young Children with Autism Spectrum Disorder: The Influence of the Environment. American Journal of Speech-Language Pathology. 2006;15(1):57-71. X-3, X-5
196. Miller CA. Developmental Relationships between Language and Theory of Mind. American Journal of Speech-Language Pathology. 2006;15(2):142-54. X-2, X-5
197. Molloy CA, Morrow AL, Meinzen-Derr J, et al. Elevated cytokine levels in children with autism spectrum disorder. Journal of Neuroimmunology. 2006;172(1-2):198-205. X-5
198. Munir S, Scholwinski E, Lasser J. The Use of Psychodrama Techniques for Students with Asperger's Disorder. Journal of School Counseling. 2006;4(2):1-38. X-1, X-2, X-3, X-4
199. Nation K, Clarke P, Wright B, et al. Patterns of Reading Ability in Children with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders. 2006;36(7):911-9. X-5
200. Niehus R, Lord C. Early Medical History of Children with Autism Spectrum Disorders. Journal of Developmental and Behavioral Pediatrics. 2006;27(Suppl2):S120-S7. X-5
201. Ouellette-Kuntz H, Coo H, Yu TC, et al. Prevalence of Pervasive Developmental Disorders in Two Canadian Provinces. Journal of Policy and Practice in Intellectual Disabilities. 2006;3(3):164-72. X-5
202. Pistoljevic N, Greer DR. The Effects of Daily Intensive Tact Instruction on Preschool Students' Emission of Pure Tacts and Mands in Non-Instructional Setting. Journal of Early and Intensive Behavior Intervention. 2006;3(1):103-20. X-3
203. Richler J, Luyster R, Risi S, et al. Is There a 'Regressive Phenotype' of Autism Spectrum Disorder Associated with the Measles-Mumps-Rubella Vaccine? A CPEA Study. Journal of Autism and Developmental Disorders. 2006;36(3):299-316. X-5

204. Smeets EEJ, Julu POO, van Waardenburg D, et al. Management of a severe forceful breather with Rett Syndrome using carbogen. Brain & Development. 2006;28(10):625-32. X-5
205. Stahmer AC, Schreibman L, Powell NP. Social Validation of Symbolic Play Training for Children with Autism. Journal of Early and Intensive Behavior Intervention. 2006;3(2):196-210. X-3
206. Stichter JP, Brown T, Clarent R, et al. Addressing the Challenges: Developing a Programmatic Framework for the Systematic Integration of Evidence-Based Practices for Young Children with Autism Spectrum Disorder. Beyond Behavior. 2006;16(1):18-32. X-2, X-5
207. Stuart SK, Flis LD, Rinaldi C. Connecting with Families: Parents Speak up about Preschool Services for Their Children with Autism Spectrum Disorders. TEACHING Exceptional Children. 2006;39(1):46-51. X-4, X-5
208. Tang J-C, Wu L-T, Chiang C-H. An Investigation of Variables Relevant to the Stereotyped Behavior in Students with Developmental Disabilities in Taiwan. Journal of the International Association of Special Education. 2006;7(1):28-35. X-5
209. Tiger JH, Hanley GP, Hernandez E. An Evaluation of the Value of Choice with Preschool Children. Journal of Applied Behavior Analysis. 2006;39(1):1-16. X-3, X-5
210. Tissot C, Evans R. Securing Provision for Children with Autistic Spectrum Disorders: The Views of Parents. Research Article. Perspectives in Education. 2006 March 2006;24(1):73-86. X-5
211. Tofil NM, Buckmaster MA, Winkler MK, et al. Deep Sedation with Propofol in Patients with Rett Syndrome. Journal of Child Neurology. 2006;21(3):210-3. X-5
212. Wood JJ, Piacentini JC, Southam-Gerow M, et al. Family cognitive behavioral therapy for child anxiety disorders. J Am Acad Child Adolesc Psychiatry. 2006 Mar;45(3):314-21. PMID: 16540816; X-5
213. Alpern CS, Zager D. Addressing Communication Needs of Young Adults with Autism in a College-Based Inclusion Program. Division on Developmental Disabilities, Council for Exceptional Children. DDD, P.O. Box 3512, Fayetteville, AR 72702.; 2007. p. 428-36. X-4
214. Anderson DK, Lord C, Risi S, et al. Patterns of growth in verbal abilities among children with autism spectrum disorder. J Consult Clin Psychol. 2007 Aug;75(4):594-604. PMID: 17663613; X-5
215. Banda DR, Matuszny RM, Turkan S. Video Modeling Strategies to Enhance Appropriate Behaviors in Children with Autism Spectrum Disorders. TEACHING Exceptional Children. 2007;39(6):47-52. X-1, X-2, X-3, X-4
216. Beresford B, Tozer R, Rabiee P, et al. Desired Outcomes for Children and Adolescents with Autistic Spectrum Disorders. Children & Society. 2007;21(1):4-16. X-5
217. Bergström-Isacsson M, Julu POO, Witt-Engerström I. Autonomic responses to music and vibroacoustic therapy in Rett syndrome: A controlled within-subject study. Nordic Journal of Music Therapy. 2007;16(1):42-59. X-5
218. Biederman BG, Freedman B. Modeling Skills, Signs and Lettering for Children with Down Syndrome, Autism and Other Severe Developmental Delays by Video Instruction in Classroom Setting. Journal of Early and Intensive Behavior Intervention. 2007;4(4):736-43. X-1, X-2, X-3, X-4
219. Conroy MA, Asmus JM, Boyd BA, et al. Antecedent Classroom Factors and Disruptive Behaviors of Children with Autism Spectrum Disorders. Journal of Early Intervention. 2007;30(1):19-35. X-3, X-5
220. Denning CB. Social Skills Interventions for Students with Asperger Syndrome and High-Functioning Autism: Research Findings and Implications for Teachers. Beyond Behavior. 2007;16(3):16-23. X-2, X-5
221. Fabrizio MA, Schirmer K, King A, et al. Precision Teaching a Foundational Motor Skill to a Child with Autism. Journal of Precision Teaching and Celeration. 2007;23:16-8. X-3, X-4
222. Fisher WW, Kodak T, Moore JW. Embedding an Identity-Matching Task within a Prompting Hierarchy to Facilitate Acquisition of Conditional Discriminations in Children with Autism. Journal of Applied Behavior Analysis. 2007;40(3):489-99. X-3
223. Fortunato JA, Sigafoos J, Morsillo-Searls LM. A Communication Plan for Autism and its Applied Behavior Analysis Treatment: A Framing Strategy. Child and Youth Care Forum. 2007;36(2-3):87-97. X-2, X-4, X-5
224. Foxx RM, Meindl J. The long term successful treatment of the aggressive/destructive behaviors of a preadolescent with autism. Behavioral Interventions. 2007;22(1):83-97. X-5
225. Goodman G, Williams CM. Interventions for Increasing the Academic Engagement of Students with Autism Spectrum Disorders in Inclusive Classrooms. TEACHING Exceptional Children. 2007;39(6):53-61. X-1, X-2, X-3, X-4
226. Grey IM, Bruton C, Honan R, et al. Co-Operative Learning for Children with an Autistic Spectrum Disorder (ASD) in Mainstream and Special Class Settings: An Exploratory Study. Educational Psychology in Practice. 2007;23(4):317-27. X-3

227. Halle J, Meadan H. A protocol for assessing early communication of young children with autism and other developmental disabilities. Topics in Early Childhood Special Education. 2007;27(1):49-61. X-3, X-5
228. Hilton C, Graver K, LaVesser P. Relationship between social competence and sensory processing in children with high functioning autism spectrum disorders. Research in Autism Spectrum Disorders. 2007;1(2):164-73. X-5
229. Kelley ME, Shillingsburg AM, Castro JM, et al. Assessment of the Functions of Vocal Behavior in Children with Developmental Disabilities: A Replication. Journal of Applied Behavior Analysis. 2007;40(3):571-6. X-5
230. Landa R. Early Communication Development and Intervention for Children with Autism. Mental Retardation and Developmental Disabilities Research Reviews. 2007;13(1):16-25. X-2, X-5
231. Lee L-C, David AB, Rusyniak J, et al. Performance of the Social Communication Questionnaire in children receiving preschool special education services. Research in Autism Spectrum Disorders. 2007;1(2):126-38. X-5
232. Luyster R, Qiu S, Lopez K, et al. Predicting outcomes of children referred for autism using the MacArthur--Bates Communicative Development Inventory. Journal of Speech, Language, and Hearing Research. 2007;50(3):667-81. X-5
233. Matson JL, Matson ML, Rivet TT. Social-Skills Treatments for Children with Autism Spectrum Disorders: An Overview. SAGE Publications. 2455 Teller Road, Thousand Oaks, CA 91320.; 2007. p. 682-707. X-1, X-2, X-3, X-4
234. McClellan J, Sikich L, Findling RL, et al. Treatment of Early-Onset Schizophrenia Spectrum Disorders (TEOSS): Rationale, Design, and Methods. Journal of the American Academy of Child & Adolescent Psychiatry. 2007;46(8):969-78. X-5
235. Medhurst B, Beresford J. "THOMAS" Training: An Early Years Intervention for Children with an Autistic Spectrum Disorder (ASD). Educational Psychology in Practice. 2007;23(1):1-17. X-1, X-3, X-4
236. Newman L. Secondary School Experiences of Students with Autism. Facts from NLTS2. NCSER 2007-3005. 2007:1-16. X-5
237. Niederhofer H. Glutamate antagonists seem to be slightly effective in psychopharmacologic treatment of autism. Journal of Clinical Psychopharmacology. 2007;27(3):317-8. X-3
238. Nikopoulos CK, Keenan M. Using video modeling to teach complex social sequences to children with autism. J Autism Dev Disord. 2007 Apr;37(4):678-93. PMID: 16897375; X-3
239. Petursdottir A-L, McComas J, McMaster K, et al. The Effects of Scripted Peer Tutoring and Programming Common Stimuli on Social Interactions of a Student with Autism Spectrum Disorder. Journal of Applied Behavior Analysis. 2007;40(2):353-7. X-3
240. Ross-Swain D. The Effects of Auditory Stimulation on Auditory Processing Disorder: A Summary of the Findings. International Journal of Listening. 2007;21(2):140-55. X-1, X-3, X-4
241. Shattuck PT, Grosse SD. Issues Related to the Diagnosis and Treatment of Autism Spectrum Disorders. Mental Retardation and Developmental Disabilities Research Reviews. 2007;13(2):129-35. X-5
242. Simpson CG, Spencer VG, Button R, et al. Using Guided Reading with Students with Autism Spectrum Disorders. TEACHING Exceptional Children Plus. 2007;4(1):1-9. X-2, X-3, X-4
243. Stahmer AC, Mandell DS. State infant/toddler program policies for eligibility and services provision for young children with autism. Administration and Policy in Mental Health and Mental Health Services Research. 2007;34(1):29-37. X-4
244. Stichter JP, Crider G, Moody M, et al. Developing an Outcome-Based Curricular Framework for Employing Evidence-Based Practices in Autism. Beyond Behavior. 2007;16(2):3-17. X-3, X-4
245. Tomchek SD, Dunn W. Sensory processing in children with and without autism: A comparative study using the Short Sensory Profile. American Journal of Occupational Therapy. 2007;61(2):190-200. X-5
246. van Ijzendoorn MH, Rutgers AH, Bakermans-Kranenburg MJ, et al. Parental sensitivity and attachment in children with autism spectrum disorder: Comparison with children with mental retardation, with language delays, and with typical development. Child Development. 2007;78(2):597-608. X-5
247. Walpole CW, Roscoe EM, Dube WV. Use of a Differential Observing Response to Expand Restricted Stimulus Control. Journal of Applied Behavior Analysis. 2007;40(4):707-12. X-3
248. Webb SJ, Nalty T, Munson J, et al. Rate of head circumference growth as a function of autism diagnosis and history of autistic regression. Journal of Child Neurology. 2007;22(10):1182-90. X-5
249. Woo EJ, Ball R, Landa R, et al. Developmental regression and autism reported to the Vaccine Adverse Event Reporting System. Autism. 2007;11(4):301-10. X-5
250. Zambolin K, Fabrizio M, Ferris K, et al. Tracking Teachers' Behavior to Concurrently Decrease Punishment Use with and Problem Behavior in a Child with Autism while Decreasing the Child's Frequency of Negative Statements. Journal of Precision Teaching and Celeration. 2007;23:27-9. X-3

251. Barcia G, Posar A, Santucci M, et al. Autism and coeliac disease. Journal of Autism and Developmental Disorders. 2008;38(2):407-8. X-2, X-5
252. Bauminger N, Solomon M, Aviezer A, et al. Children with autism and their friends: A multidimensional study of friendship in high-functioning autism spectrum disorder. Journal of Abnormal Child Psychology. 2008;36(2):135-50. X-5
253. Bevan-Brown J, Carroll-Lind J, Kearney A, et al. Making Assumptions vs. Building Relationships: Lessons from a Participatory Action Research Project to Identify Effective Practices for Learners with Autism Spectrum Disorder. Kairaranga. 2008;9:22-31. X-3, X-5
254. Bloh C. Assessing Transfer of Stimulus Control Procedures across Learners with Autism. Analysis of Verbal Behavior. 2008;24:87-101. X-3
255. Boyd BA, Conroy MA, Asmus JM, et al. Descriptive Analysis of Classroom Setting Events on the Social Behaviors of Children with Autism Spectrum Disorder. Education and Training in Developmental Disabilities. 2008;43(2):186-97. X-3, X-5
256. Bradley LA, Krakowski B, Thiessen A. With Little Research out There It's a Matter of Learning What Works in Teaching Students with Deafness and Autism. Odyssey: New Directions in Deaf Education. 2008;9(1):16-8. X-2, X-5
257. Cahill SM. Teaching Organizational Skills through Self-Regulated Learning Strategies. TEACHING Exceptional Children Plus. 2008;5(1):1-9. X-5
258. Cain J. Teaming from Three Perspectives: Interviews with Participatory Action Research Participants. Kairaranga. 2008;9:43-5. X-3, X-5
259. Dahlgren S, Sandberg AD. Referential communication in children with autism spectrum disorder. Autism. 2008;12(4):335-48. X-5
260. Dawson G. Early behavioral intervention, brain plasticity, and the prevention of autism spectrum disorder. Dev Psychopathol. 2008 Summer;20(3):775-803. PMID: 18606031; X-5
261. Delano ME, Stone L. Extending the Use of Social Stories to Young Children with Emotional and Behavioral Disabilities. Beyond Behavior. 2008;18(1):2-8. X-1, X-3, X-4
262. DeVincent C, Gadow KD, Strong G, et al. Screening for autism spectrum disorder with the Early Childhood Inventory-4. Journal of Developmental and Behavioral Pediatrics. 2008;29(1):1-10. X-5
263. Dodd S, Hupp SDA, Jewell JD, et al. Using parents and siblings during a social story intervention for two children diagnosed with PDD-NOS. Journal of Developmental and Physical Disabilities. 2008;20(3):217-29. X-3
264. Fitzgerald PB, Herring S, Hoy K, et al. A study of the effectiveness of bilateral transcranial magnetic stimulation in the treatment of the negative symptoms of schizophrenia. Brain Stimul. 2008 Jan;1(1):27-32. PMID: 20633367; X-5
265. Gita S, Bognar J, Kalbli K, et al. Comparative Study on Inclusive and Special Education Curricula in Hungary. Physical Education and Sport. 2008;52:16-22. X-1, X-3, X-4
266. Hartwig Moorhead HJ, Green J, McQuistion RR, et al. Wellness Interventions for School Counselors: A Case-Study in Treating Asperger's Disorder. Journal of School Counseling. 2008;6(1):1-33. X-5
267. Hasselbusch A, Penman M. Working Together: An Occupational Therapy Perspective on Collaborative Consultation. Kairaranga. 2008;9(1):24-31. X-1, X-3, X-4
268. Hergüner S, Mukaddes NM. Risperidone-induced double incontinence. Progress in Neuro-Psychopharmacology & Biological Psychiatry. 2008;32(4):1085-6. X-3
269. Hines E, Simonsen B. The Effects of Picture Icons on Behavior for a Young Student with Autism. Beyond Behavior. 2008;18(1):9-17. X-3
270. Jurecka A, Tylki-Szymanska A, Zikanova M, et al. D-ribose therapy in four Polish patients with adenylosuccinate lyase deficiency: absence of positive effect. J Inherit Metab Dis. 2008 Dec;31 Suppl 2:S329-32. PMID: 18649008; X-5
271. Kelly A. What Works for One: Practice Considerations for Supporting a Child or Young Person with Autism Spectrum Disorder, Drawn from Participatory Action Research. Kairaranga. 2008;9:54-60. X-1, X-3, X-4
272. Kuhn LR, Bodkin AE, Devlin SD, et al. Using Pivotal Response Training with Peers in Special Education to Facilitate Play in Two Children with Autism. Education and Training in Developmental Disabilities. 2008;43(1):37-45. X-3
273. Lattimore LP, Parsons MB, Reid DH. Simulation training of community job skills for adults with autism: A further analysis. Behavior Analysis in Practice. 2008;1(1):24-9. X-5
274. Lerman DC, Sansbury T, Hovanetz A, et al. Using behavior analysis to examine the outcomes of unproven therapies: An evaluation of hyperbaric oxygen therapy for children with autism. Behavior Analysis in Practice. 2008;1(2):50-8. X-3

275. Lindsey-Glenn PF, Gentry JE. Improving Vocabulary Skills through Assistive Technology: Rick's Story. TEACHING Exceptional Children Plus. 2008;5(2):1-11. X-3
276. Loiacono V, Allen B. Are Special Education Teachers Prepared to Teach the Increasing Number of Students Diagnosed with Autism? International Journal of Special Education. 2008;23(2):120-7. X-4, X-5
277. Loth E, Gómez JC, Happé F. Detecting changes in naturalistic scenes: Contextual inconsistency does not influence spontaneous attention in high-functioning people with autism spectrum disorder. Autism Research. 2008;1(3):179-88. X-5
278. Matson JL, Ancona MN, Wilkins J. Sleep Disturbances in Adults with Autism Spectrum Disorders and Severe Intellectual Impairments. Journal of Mental Health Research in Intellectual Disabilities. 2008;1(3):129-39. X-5
279. Matson JL, Gonzalez ML, Rivet TT. Reliability of the Autism Spectrum Disorder-Behavior Problems for Children (ASD-BPC). Research in Autism Spectrum Disorders. 2008;2(4):696-706. X-4, X-5
280. Medhurst B, Clay D. The Thomas Outreach Project (TOP): An Early Years Intervention for Children with an Autistic Spectrum Disorder (ASD). Educational Psychology in Practice. 2008;24(1):69-78. X-1, X-2, X-3, X-4
281. Morgan L, Wetherby AM, Barber A. Repetitive and stereotyped movements in children with autism spectrum disorders late in the second year of life. Journal of Child Psychology and Psychiatry. 2008;49(8):826-37. X-5
282. Najdowski AC, Wallace MD, Penrod B, et al. Caregiver-Conducted Experimental Functional Analyses of Inappropriate Mealtime Behavior. Journal of Applied Behavior Analysis. 2008;41(3):459-65. X-3, X-4
283. Ozonoff S, Macari S, Young GS, et al. Atypical object exploration at 12 months of age is associated with autism in a prospective sample. Autism. 2008;12(5):457-72. X-5
284. Petursdottir AI, Carr JE, Lechago SA, et al. An Evaluation of Intraverbal Training and Listener Training for Teaching Categorization Skills. Journal of Applied Behavior Analysis. 2008;41(1):53-68. X-1, X-3, X-4
285. Reichle J, Dropik PL, Alden-Anderson E, et al. Teaching a Young Child with Autism to Request Assistance Conditionally: A Preliminary Study. American Journal of Speech-Language Pathology. 2008;17(3):231-40. X-3
286. Robertson MA, Sigalet DL, Holst JJ, et al. Intestinal Permeability and Glucagon-like peptide-2 in Children with Autism: A Controlled Pilot Study. Journal of Autism and Developmental Disorders. 2008;38(6):1066-71. X-5
287. Russell AJ, Mataix-Cols D, Anson MAW, et al. Psychological treatment for obsessive-compulsive disorder in people with autism spectrum disorders—A pilot study. Psychotherapy and Psychosomatics. 2008;78(1):59-61. X-5
288. Salter G, Seigal A, Claxton M, et al. Can autistic children read the mind of an animated triangle? Autism. 2008;12(4):349-71. X-4, X-5
289. Schechter R, Grether JK. Continuing increases in autism reported to California's developmental services system: Mercury in retrograde. Archives of General Psychiatry. 2008;65(1):19-24. X-5
290. Silverman MJ. Nonverbal Communication, Music Therapy, and Autism: A Review of Literature and Case Example. Journal of Creativity in Mental Health. 2008;3(1):3-19. X-2, X-5
291. Simpson RL. Children and Youth with Autism Spectrum Disorders: The Search for Effective Methods. Focus on Exceptional Children. 2008 March 2008;40(7):1. X-5
292. Skokauskas N, Moran T. Role of CAMHS in assessing children with suspected autism-spectrum disorder in Ireland. Psychiatric Bulletin. 2008;32(10):394. X-5
293. Smith L. Ethical Principles in Practice: Evidence from Participatory Action Research. Kairaranga. 2008;9:16-21. X-5
294. Stock RA, Schulze KA, Mirenda P. A Comparison of Stimulus-Stimulus Pairing, Standard Echoic Training, and Control Procedures on the Vocal Behavior of Children with Autism. Analysis of Verbal Behavior. 2008;24:123-33. X-3
295. Szymanski C, Brice PJ. When Autism and Deafness Coexist in Children: What We Know Now. Odyssey: New Directions in Deaf Education. 2008;9(1):10-5. X-5
296. Vedora J, Ross R, Kelm K. Feeding Frenzy: Using Picture Schedules to Reduce Mealtime Struggles. TEACHING Exceptional Children Plus. 2008;4(6):1-11. X-3
297. Weiss MJ, Fabrizio M, Bamond M. Skill Maintenance and Frequency Building: Archival Data from Individuals with Autism Spectrum Disorders. Journal of Precision Teaching and Celeration. 2008;24:28-37. X-1, X-3, X-4
298. Williams KE, Hendy H, Knecht S. Parent feeding practices and child variables associated with childhood feeding problems. Journal of Developmental and Physical Disabilities. 2008;20(3):231-42. X-5
299. Yeh-Kennedy M. Brady, Our Firstborn Son, Has Autism. Odyssey: New Directions in Deaf Education. 2008;9(1):26-30. X-5
300. Young HA, Geier DA, Geier MR. Thimerosal exposure in infants and neurodevelopmental disorders: An assessment of computerized medical records in the Vaccine Safety Datalink. Journal of the Neurological Sciences. 2008;271(1-2):110-8. X-5

301. Ager S, Downs J, Fyfe S, et al. Parental experiences of scoliosis management in Rett syndrome. Disability and Rehabilitation: An International, Multidisciplinary Journal. 2009;31(23):1917-24. X-5
302. Alwell M, Cobb B. Social and Communicative Interventions and Transition Outcomes for Youth with Disabilities: A Systematic Review. Career Development for Exceptional Individuals. 2009;32(2):94-107. X-1, X-3, X-4
303. Amend ER, Schuler P, Beaver-Gavin K, et al. A Unique Challenge: Sorting out the Differences between Giftedness and Asperger's Disorder. Gifted Child Today. 2009;32(4):57-63. X-5
304. Ames CS, Jarrold C. Identifying symbolic relationships in autism spectrum disorders: a deficit in the identification of temporal co-occurrence? J Autism Dev Disord. 2009 Dec;39(12):1723-34. PMID: 19593646; X-5
305. Asaro K, Saddler B. Effects of Planning Instruction on a Young Writer with Asperger Syndrome. Intervention in School and Clinic. 2009;44(5):268-75. X-3
306. Atladóttir HÓ, Pedersen MG, Thorsen P, et al. Association of family history of autoimmune diseases and autism spectrum disorders. Pediatrics. 2009;124(2):687-94. X-5
307. Bellini S, Benner L, Peters-Myszak J. A Systematic Approach to Teaching Social Skills to Children with Autism Spectrum Disorders: A Guide for Practitioners. Beyond Behavior. 2009;19(1):26-39. X-1, X-2, X-3, X-4
308. Benavides CA, Poulson CL. Task Interspersal and Performance of Matching Tasks by Preschoolers with Autism. Research in Autism Spectrum Disorders. 2009;3(3):619-29. X-3
309. Boulet SL, Boyle CA, Schieve LA. Health care use and health and functional impact of developmental disabilities among US children, 1997-2005. Arch Pediatr Adolesc Med. 2009 Jan;163(1):19-26. PMID: 19124699; X-5
310. Campbell DB, Buie TM, Winter H, et al. Distinct genetic risk based on association of MET in families with co-occurring autism and gastrointestinal conditions. Pediatrics. 2009;123(3):1018-24. X-5
311. Carter SL. Recent Trends in Conducting School-Based Experimental Functional Analyses. International Journal of Behavioral Consultation and Therapy. 2009;5(2):185-91. X-2
312. Chan AL, Wang MT, Su CY, et al. Risk of digoxin intoxication caused by clarithromycin-digoxin interactions in heart failure patients: a population-based study. Eur J Clin Pharmacol. 2009 Dec;65(12):1237-43. PMID: 19655133; X-5
313. Chappell N, Graff RB, Libby ME, et al. Further Evaluation of the Effects of Motivating Operations on Preference Assessment Outcomes. Research in Autism Spectrum Disorders. 2009;3(3):660-9. X-3
314. Daniel KL, Prue C, Taylor MK, et al. 'Learn the signs. Act early': A campaign to help every child reach his or her full potential. Public Health. 2009;123(Suppl 1):e11-e6. X-1, X-3, X-4
315. Darrow A-A. Adapting for Students with Autism. General Music Today. 2009;22(2):24-6. X-5
316. DeLeon IG, Frank MA, Gregory MK, et al. On the Correspondence between Preference Assessment Outcomes and Progressive-Ratio Schedule Assessments of Stimulus Value. Journal of Applied Behavior Analysis. 2009;42(3):729-33. X-5
317. Delgado CE. Fourth Grade Outcomes of Children with a Preschool History of Developmental Disability. Education and Training in Developmental Disabilities. 2009;44(4):573-9. X-5
318. Dorminy KP, Luscre D, Gast DL. Teaching organizational skills to children with high functioning autism and Asperger's syndrome. Education and Training in Developmental Disabilities. 2009;44(4):538-50. X-3
319. Eikeseth S, Hayward DW. The Discrimination of Object Names and Object Sounds in Children with Autism: A Procedure for Teaching Verbal Comprehension. Journal of Applied Behavior Analysis. 2009;42(4):807-12. X-3, X-5
320. Foto Özdemir D, Ilgın Karabacak N, Akkaş BE, et al. Differences in cerebral blood flow following risperidone treatment in children with autistic disorder. Türk Psikiyatri Dergisi. 2009;20(4):1-9. X-6
321. Fox RA, Holtz CA, Moist AM. A community-based accommodation program for adults with autism and mental retardation. Education and Training in Developmental Disabilities. 2009;44(1):118-26. X-5
322. François D, Powell S, Dautenhahn K. A long-term study of children with autism playing with a robotic pet: Taking inspirations from non-directive play therapy to encourage children's proactivity and initiative-taking. Interaction Studies: Social Behaviour and Communication in Biological and Artificial Systems. 2009;10(3):324-73. X-3
323. Geller E, Foley GM. Expanding the "Ports of Entry" for Speech-Language Pathologists: A Relational and Reflective Model for Clinical Practice. American Journal of Speech-Language Pathology. 2009;18(1):4-21. X-5
324. Gerhard T, Chavez B, Olfson M, et al. National patterns in the outpatient pharmacological management of children and adolescents with autism spectrum disorder. Journal of Clinical Psychopharmacology. 2009;29(3):307-10. X-4

325. Glaze DG, Percy AK, Motil KJ, et al. A study of the treatment of Rett syndrome with folate and betaine. Journal of Child Neurology. 2009;24(5):551-6. X-5
326. Goin-Kochel RP, Mackintosh VH, Myers BJ. Parental reports on the efficacy of treatments and therapies for their children with autism spectrum disorders. Research in Autism Spectrum Disorders. 2009;3(2):528-37. X-4
327. Granpeesheh D, Dixon DR, Tarbox J, et al. The Effects of Age and Treatment Intensity on Behavioral Intervention Outcomes for Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2009;3(4):1014-22. X-5
328. Gregory MK, DeLeon IG, Richman DM. The Influence of Matching and Motor-Imitation Abilities on Rapid Acquisition of Manual Signs and Exchange-Based Communicative Responses. Journal of Applied Behavior Analysis. 2009;42(2):399-404. X-3
329. Grenwelge CH. Test Review: Woodcock, R. W., Schrank, F. A., Mather, N., & McGrew, K. S. 2007). "Woodcock-Johnson III Tests of Achievement, Form C/Brief Battery." Rolling Meadows, IL: Riverside. Journal of Psychoeducational Assessment. 2009;27(4):345-50. X-5
330. Griffith PS, Powlett CL, Griffith AD, et al. An exploratory analysis of the epidemiology and surgical management of perforated diverticular disease over a two-year period at a referral centre in the Caribbean. West Indian Med J. 2009 Dec;58(6):561-5. PMID: 20583683; X-1, X-3, X-4, X-5
331. Gustafsson C, Ojehagen A, Hansson L, et al. Effects of Psychosocial Interventions for People with Intellectual Disabilities and Mental Health Problems: A Survey of Systematic Reviews. SAGE Publications. 2455 Teller Road, Thousand Oaks, CA 91320.; 2009. p. 281-90. X-4
332. Gutierrez A, Hale MN, O'Brien HA, et al. Evaluating the Effectiveness of Two Commonly Used Discrete Trial Procedures for Teaching Receptive Discrimination to Young Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2009;3(3):630-8. X-3
333. Hallahan B, Daly EM, McAlonan G, et al. Brain morphometry volume in autistic spectrum disorder: A magnetic resonance imaging study of adults. Psychological Medicine. 2009;39(2):337-46. X-5
334. Hammerschlag CA. Autistic rider. Caring. 2009 Aug;28(8):62. PMID: 19772030; X-5
335. Hartley SL, Sikora DM. Sex Differences in Autism Spectrum Disorder: An Examination of Developmental Functioning, Autistic Symptoms, and Coexisting Behavior Problems in Toddlers. Journal of Autism and Developmental Disorders. 2009;39(12):1715-22. X-5
336. Hayward DW, Gale CM, Eikeseth S. Intensive Behavioural Intervention for Young Children with Autism: A Research-Based Service Model. Research in Autism Spectrum Disorders. 2009;3(3):571-80. X-5
337. Herscovitch B, Roscoe EM, Libby ME, et al. A Procedure for Identifying Precursors to Problem Behavior. Journal of Applied Behavior Analysis. 2009;42(3):697-702. X-5
338. Jeste SS, Nelson CA. Event Related Potentials in the Understanding of Autism Spectrum Disorders: An Analytical Review. Springer. 233 Spring Street, New York, NY 10013.; 2009. p. 495-510. X-4
339. Keen D. Engagement of Children with Autism in Learning. Australasian Journal of Special Education. 2009 October 2009;33(2):130-40. X-5
340. Kishida Y, Kemp C. The engagement and interaction of children with autism spectrum disorder in segregated and inclusive early childhood center-based settings. Topics in Early Childhood Special Education. 2009;29(2):105-18. X-4
341. Kodak T, Clements A. Acquisition of Mands and Tacts with Concurrent Echoic Training. Journal of Applied Behavior Analysis. 2009;42(4):839-43. X-3
342. Kozima H, Michalowski MP, Nakagawa C. Keepon: A playful robot for research, therapy, and entertainment. International Journal of Social Robotics. 2009;1(1):3-18. X-3, X-4
343. Kroeger AK, Sorensen-Burnworth R. Toilet Training Individuals with Autism and Other Developmental Disabilities: A Critical Review. 2009;3:607-18. X-5
344. Kurt O, Parsons C. Improving Classroom Learning: The Effectiveness of Time Delay within the TEACCH Approach. International Journal of Special Education. 2009;24(3):173-85. X-3
345. Lancioni GE, Singh NN, O'Reilly MF, et al. Microswitch- and VOCA-Assisted Programs for Two Post-Coma Persons with Minimally Conscious State and Pervasive Motor Disabilities. Research in Developmental Disabilities: A Multidisciplinary Journal. 2009;30(6):1459-67. X-5
346. Lang R, Machalicek W, O'Reilly M, et al. Review of Interventions to Increase Functional and Symbolic Play in Children with Autism. Education and Training in Developmental Disabilities. 2009;44(4):481-92. X-1, X-2, X-3, X-4
347. Lattimore LP, Parsons MB, Reid DH. Rapid training of a community job skill to nonvocal adults with autism: An extension of intensive teaching. Behavior Analysis in Practice. 2009;2(1):34-42. X-5

348. Levingston HB, Neef NA, Cihon TM. The Effects of Teaching Precurrent Behaviors on Children's Solution of Multiplication and Division Word Problems. Journal of Applied Behavior Analysis. 2009;42(2):361-7. X-3, X-5
349. Lunsky Y, Gracey C, Bradley E. Adults with autism spectrum disorders using psychiatric hospitals in Ontario: Clinical profile and service needs. Research in Autism Spectrum Disorders. 2009;3(4):1006-13. X-5
350. MacDonald R, Sacramone S, Mansfield R, et al. Using Video Modeling to Teach Reciprocal Pretend Play to Children with Autism. Journal of Applied Behavior Analysis. 2009;42(1):43-55. X-3
351. Machalicek W, O'Reilly M, Chan JM, et al. Using Videoconferencing to Conduct Functional Analysis of Challenging Behavior and Develop Classroom Behavioral Support Plans for Students with Autism. Education and Training in Developmental Disabilities. 2009;44(2):207-17. X-3
352. Mancil RG. Milieu Therapy as a Communication Intervention: A Review of the Literature Related to Children with Autism Spectrum Disorder. Division on Developmental Disabilities, Council for Exceptional Children. DDD, P.O. Box 3512, Fayetteville, AR 72702.; 2009. p. 105-17. X-4
353. Martin N. Art Therapy and Autism: Overview and Recommendations. Art Therapy: Journal of the American Art Therapy Association. 2009 2009;26(4):187-90. X-5
354. Matson JL, Fodstad JC. The Treatment of Food Selectivity and Other Feeding Problems in Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2009;3(2):455-61. X-1, X-2, X-3, X-4
355. Matson JL, Fodstad JC, Dempsey T. The Relationship of Children's Feeding Problems to Core Symptoms of Autism and PDD-NOS. Research in Autism Spectrum Disorders. 2009;3(3):759-66. X-5
356. Matson JL, Fodstad JC, Mahan S, et al. Cutoffs, Norms, and Patterns of Comorbid Difficulties in Children with an ASD on the Baby and Infant Screen for Children with aUtIsm Traits (BISCUIT-Part 2). Research in Autism Spectrum Disorders. 2009;3(4):977-88. X-5
357. McGarrell M, Healy O, Leader G, et al. Six reports of children with autism spectrum disorder following intensive behavioral intervention using the preschool inventory of repertoires for kindergarten (PIRK®). Research in Autism Spectrum Disorders. 2009;3(3):767-82. X-3
358. McGarrell M, Healy O, Leader G, et al. Six Reports of Children with Autism Spectrum Disorder Following Intensive Behavioral Intervention Using the Preschool Inventory of Repertoires for Kindergarten (PIRK[R]). Research in Autism Spectrum Disorders. 2009;3(3):767-82. X-3
359. Meadan H, Ostrosky MM, Zaghlawan HY, et al. Promoting the Social and Communicative Behavior of Young Children with Autism Spectrum Disorders: A Review of Parent-Implemented Intervention Studies. SAGE Publications and Hammill Institute on Disabilities. 2455 Teller Road, Thousand Oaks, CA 91320.; 2009. p. 90-104. X-1, X-2, X-3, X-4
360. Moore TR. A brief report on the effects of a self-management treatment package on stereotypic behavior. Research in Autism Spectrum Disorders. 2009;3(3):695-701. X-5
361. Morris EK. A Case Study in the Misrepresentation of Applied Behavior Analysis in Autism: The Gernsbacher Lectures. Behavior Analyst. 2009;32(1):205-40. X-5
362. Noggle CA, Dean RS. Atypical and Typical Antipsychotics in the Schools. Psychology in the Schools. 2009;46(9):869-84. X-1, X-2, X-3, X-4
363. Oblak A, Gibbs TT, Blatt GJ. Decreased GABAA receptors and benzodiazepine binding sites in the anterior cingulate cortex in autism. Autism Research. 2009;2(4):205-19. X-5
364. O'Connor E. The Use of Social Story DVDs to Reduce Anxiety Levels: A Case Study of a Child with Autism and Learning Disabilities. Support for Learning. 2009;24(3):133-6. X-3
365. O'Reilly M, Lang R, Davis T, et al. A Systematic Examination of Different Parameters of Presession Exposure to Tangible Stimuli that Maintain Problem Behavior. Journal of Applied Behavior Analysis. 2009;42(4):773-83. X-3, X-5
366. Orvalho V, Miranda J, Sousa AA. Facial synthesys of 3D avatars for therapeutic applications. Annual Review of CyberTherapy and Telemedicine. 2009;7:96-8. X-1, X-3
367. Ozonoff S, Young GS, Steinfeld MB, et al. How early do parent concerns predict later autism diagnosis? Journal of Developmental and Behavioral Pediatrics. 2009;30(5):367-75. X-5
368. Pence ST, Roscoe EM, Bourret JC, et al. Relative Contributions of Three Descriptive Methods: Implications for Behavioral Assessment. Journal of Applied Behavior Analysis. 2009;42(2):425-46. X-5
369. Pennington RC. Exploring New Waters: Writing Instruction for Students with Autism Spectrum Disorders. Beyond Behavior. 2009;19(1):17-25. X-5
370. Planty M, Hussar W, Snyder T, et al. The Condition of Education 2009: Indicator 9--Children and Youth With Disabilities. NCES 2009-081. National Center for Education Statistics. , P.O. Box 1398, Jessup, MD 20794-1398.; 2009. p. 5. X-4

371. Reeb RN, Folger SF, Oneal BJ. Behavioral Summarized Evaluation: An assessment tool to enhance multidisciplinary and parent-professional collaborations in assessing symptoms of autism. Children's Health Care. 2009;38(4):301-20. X-5
372. Remington A, Swettenham J, Campbell R, et al. Selective attention and perceptual load in autism spectrum disorder. Psychological Science. 2009;20(11):1388-93. X-5
373. Rojahn J, Matson JL, Mahan S, et al. Cutoffs, Norms, and Patterns of Problem Behaviors in Children with an ASD on the Baby and Infant Screen for Children with aUtIsm Traits (BISCUIT-Part 3). Research in Autism Spectrum Disorders. 2009;3(4):989-98. X-5
374. Roscoe EM, Rooker GW, Pence ST, et al. Assessing the Utility of a Demand Assessment for Functional Analysis. Journal of Applied Behavior Analysis. 2009;42(4):819-25. X-5
375. Ruef MB, Nefdt N, Openden D, et al. Learn by Doing: A Collaborative Model for Training Teacher-Candidate Students in Autism. Education and Training in Developmental Disabilities. 2009;44(3):343-55. X-1, X-3, X-4
376. Schneider A, Hagerman JR, Hessl D. Fragile X Syndrome--From Genes to Cognition. Developmental Disabilities Research Reviews. 2009;15(4):333-42. X-5
377. Schumann CM, Barnes CC, Lord C, et al. Amygdala enlargement in toddlers with autism related to severity of social and communication impairments. Biological Psychiatry. 2009;66(10):942-9. X-5
378. Sharp WG, Jaquess DL. Bite size and texture assessments to prescribe treatment for severe food selectivity in autism. Behavioral Interventions. 2009;24(3):157-70. X-3
379. Shih A, Rosanoff M, Wallace S, et al. Autism Speaks Global Autism Public Health Initiative: Bridging gaps in autism awareness, research, and services around the world. Beijing Da Xue Xue Bao. 2009 Aug 18;41(4):389-91. PMID: 19845067; X-5
380. Shillingsburg AM, Kelley ME, Roane HS, et al. Evaluation and Training of Yes-No Responding across Verbal Operants. Journal of Applied Behavior Analysis. 2009;42(2):209-23. X-3
381. Shumway S, Wetherby AM. Communicative acts of children with autism spectrum disorders in the second year of life. Journal of Speech, Language, and Hearing Research. 2009;52(5):1139-56. X-5
382. Sutherland S, Stroot SA. Brad's story: Exploration of an inclusive adventure education experience. Therapeutic Recreation Journal. 2009;43(3):27-39. X-5
383. Sy JR, Borrero JC. Parametric Analysis of Presession Exposure to Edible and Nonedible Stimuli. Journal of Applied Behavior Analysis. 2009;42(4):833-7. X-5
384. Tarbox J, Madrid W, Aguilar B, et al. Use of chaining to increase complexity of echoics in children with autism. J Appl Behav Anal. 2009 Winter;42(4):901-6. PMID: 20514201; X-3
385. Temudo T, Rios M, Prior C, et al. Evaluation of CSF neurotransmitters and folate in 25 patients with Rett disorder and effects of treatment. Brain & Development. 2009;31(1):46-51. X-5
386. Thomson K, Martin GL, Arnal L, et al. Instructing Individuals to Deliver Discrete-Trials Teaching to Children with Autism Spectrum Disorders: A Review. Research in Autism Spectrum Disorders. 2009;3(3):590-606. X-5
387. Tincani M, Travers J, Boutot A. Race, Culture, and Autism Spectrum Disorder: Understanding the Role of Diversity in Successful Educational Interventions. Research and Practice for Persons with Severe Disabilities (RPSD). 2009;34(3):1-10. X-1, X-2, X-3, X-4
388. Van Rie GL, Heflin LJ. The effect of sensory activities on correct responding for children with autism spectrum disorders. Research in Autism Spectrum Disorders. 2009;3(3):783-96. X-3
389. Vilardaga R. A Relational Frame Theory Account of Empathy. International Journal of Behavioral Consultation and Therapy. 2009;5(2):178-84. X-5
390. Wang P, Spillane A. Evidence-Based Social Skills Interventions for Children with Autism: A Meta-Analysis. Education and Training in Developmental Disabilities. 2009;44(3):318-42. X-5
391. Webb SJ, Jones EJ. Early Identification of Autism: Early Characteristics, Onset of Symptoms, and Diagnostic Stability. Infants and Young Children. 2009;22(2):100-18. X-5
392. Weeden M, Ehrhardt K, Poling A. Conspicuous by Their Absence: Studies Comparing and Combining Risperidone and Applied Behavior Analysis to Reduce Challenging Behavior in Children with Autism. Research in Autism Spectrum Disorders. 2009;3(4):905-12. X-5
393. Weiss MJ, DelPizzo-Cheng E, LaRue RH, et al. ABA and PBS: The Dangers in Creating Artificial Dichotomies in Behavioral Intervention. Behavior Analyst Today. 2009;10(3):1-12. X-5
394. Whitby PJ, Mancil RG. Academic Achievement Profiles of Children with High Functioning Autism and Asperger Syndrome: A Review of the Literature. Division on Developmental Disabilities, Council for Exceptional Children. DDD, P.O. Box 3512, Fayetteville, AR 72702.; 2009. p. 551-60. X-2, X-4
395. Whitby PJ, Travers JC, Harnik J. Academic Achievement and Strategy Instruction to Support the Learning of Children with High-Functioning Autism. Beyond Behavior. 2009;19(1):3-9. X-2, X-5

396. Whittingham K, Sofronoff K, Sheffield J, et al. Behavioural Family Intervention with Parents of Children with ASD: What Do They Find Useful in the Parenting Program Stepping Stones Triple P? Research in Autism Spectrum Disorders. 2009 2009;3(3):702-13. X-5
397. Wilder DA, Register M, Register S, et al. Functional Analysis and Treatment of Rumination Using Fixed-Time Delivery of a Flavor Spray. Journal of Applied Behavior Analysis. 2009;42(4):877-82. X-5
398. Wolfe PS, Condo B, Hardaway E. Sociosexuality Education for Persons with Autism Spectrum Disorders Using Principles of Applied Behavior Analysis. TEACHING Exceptional Children. 2009;42(1):50-61. X-1, X-2, X-3, X-4
399. Wood JJ, McLeod BD, Piacentini JC, et al. One-year follow-up of family versus child CBT for anxiety disorders: Exploring the roles of child age and parental intrusiveness. Child Psychiatry Hum Dev. 2009 Jun;40(2):301-16. PMID: 19165592; X-5
400. Young A, Ruble L, McGrew J. Public vs. private insurance: Cost, use, accessibility, and outcomes of services for children with autism spectrum disorders. Research in Autism Spectrum Disorders. 2009;3(4):1023-33. X-4, X-5
401. Massachusetts & New Hampshire. Insurance; autism spectrum disorders. Ment Phys Disabil Law Rep. 2010 Sep-Oct;34(5):812. PMID: 21197720; X-5
402. Autism spectrum disorders. Diagnosis and management involve time and patience. Harv Ment Health Lett. 2010 Sep;27(3):4-5. PMID: 20941863; X-5
403. Autism spectrum disorders and the gut. Consensus recommendations for evaluation and treatment. Harv Ment Health Lett. 2010 Apr;26(10):4. PMID: 20499455; X-5
404. Effectiveness of Group Cognitive-Behavioural Treatment for Men with Intellectual Disabilities at Risk of Sexual Offending. Journal of Applied Research in Intellectual Disabilities. 2010 November 2010;23(6):537-51. X-5
405. Questions on Verbal Behavior and Its Application to Individuals with Autism: An Interview with the Experts. Behavior Analyst Today. 2010 2010;11(3):186-205. X-5
406. Adamo SM. On Not Being Able to Enter Noah's Ark. Journal of Child Psychotherapy. 2010;36(1):48-60. X-5
407. Adnani N. Design and clinical implementation of a TG-106 compliant linear accelerator data management system and MU calculator. J Appl Clin Med Phys. 2010;11(3):3212. PMID: 20717087; X-5
408. Agam Y, Joseph RM, Barton JJ, et al. Reduced cognitive control of response inhibition by the anterior cingulate cortex in autism spectrum disorders. Neuroimage. 2010 Aug 1;52(1):336-47. PMID: 20394829; X-5
409. Agyapong V, Migone M, Crosson C, et al. Recognition and management of Asperger's syndrome: Perceptions of primary school teachers. Irish Journal of Psychological Medicine. 2010;27(1):6-10. X-5
410. Akshoomoff N, Stahmer AC, Corsello C, et al. What Happens Next? Follow-Up from the Children's Toddler School Program. Journal of Positive Behavior Interventions. 2010;12(4):245-53. X-5
411. Alexander RT, Green FN, O'Mahony B, et al. Personality disorders in offenders with intellectual disability: a comparison of clinical, forensic and outcome variables and implications for service provision. J Intellect Disabil Res. 2010 Jul;54(7):650-8. PMID: 20136682; X-5
412. Allen KD, Wallace DP, Greene DJ, et al. Community-based vocational instruction using videotaped modeling for young adults with Autism Spectrum Disorders performing in air-inflated mascots. Focus on Autism and Other Developmental Disabilities. 2010;25(3):186-92. X-5
413. Allen KD, Wallace DP, Renes D, et al. Use of video modeling to teach vocational skills to adolescents and young adults with autism spectrum disorders. Education & Treatment of Children. 2010;33(3):339-49. X-5
414. Al-Shammari Z, Daniel C, Faulkner P, et al. Improving Inappropriate Social Behavior of Autistic Students Using the LISTEN Intervention Strategy. Journal of Instructional Psychology. 2010;37(4):286-94. X-1, X-3, X-4
415. Alvarez A. Levels of analytic work and levels of pathology: the work of calibration. Int J Psychoanal. 2010 Aug;91(4):859-78. PMID: 20840643; X-2, X-5
416. Aman MG, Kasper W, Manos G, et al. Line-item analysis of the Aberrant Behavior Checklist: results from two studies of aripiprazole in the treatment of irritability associated with autistic disorder. J Child Adolesc Psychopharmacol. 2010 Oct;20(5):415-22. PMID: 20973712; X-5
417. Arieff Z, Kaur M, Gameeldien H, et al. 5-HTTLPR polymorphism: analysis in South African autistic individuals. Hum Biol. 2010 Jun;82(3):291-300. PMID: 20649385; X-5
418. Asberg J, Sandberg AD. Discourse Comprehension Intervention for High-Functioning Students with Autism Spectrum Disorders: Preliminary Findings from a School-Based Study. Journal of Research in Special Educational Needs. 2010;10(2):91-8. X-1, X-3, X-4
419. Athens ES, Vollmer TR. An investigation of differential reinforcement of alternative behavior without extinction. J Appl Behav Anal. 2010 Winter;43(4):569-89. PMID: 21541145; X-3
420. Atladottir HO, Thorsen P, Ostergaard L, et al. Maternal infection requiring hospitalization during pregnancy and autism spectrum disorders. J Autism Dev Disord. 2010 Dec;40(12):1423-30. PMID: 20414802; X-5

421. Axe JB, Sainato DM. Matrix Training of Preliteracy Skills with Preschoolers with Autism. Journal of Applied Behavior Analysis. 2010;43(4):635-52. X-3
422. Bagatell N, Mirigliani G, Patterson C, et al. Effectiveness of therapy ball chairs on classroom participation in children with autism spectrum disorders. Am J Occup Ther. 2010 Nov-Dec;64(6):895-903. PMID: 21218680; X-3
423. Baharav E, Reiser C. Using telepractice in parent training in early autism. Telemed J E Health. 2010 Jul-Aug;16(6):727-31. PMID: 20583950; X-3
424. Baker JK, Haltigan JD, Brewster R, et al. Non-expert ratings of infant and parent emotion: Concordance with expert coding and relevance to early autism risk. International Journal of Behavioral Development. 2010;34(1):88-95. X-5
425. Baker N. Exploring the mental health nurse practitioner scope of practice in youth early psychosis: an anecdotal account. Contemp Nurse. 2010 Feb-Mar;34(2):211-20. PMID: 20509805; X-5
426. Banda DR, Copple KS, Koul RK, et al. Video modelling interventions to teach spontaneous requesting using AAC devices to individuals with autism: a preliminary investigation. Disabil Rehabil. 2010;32(16):1364-72. PMID: 20465397; X-1, X-3, X-4
427. Banda DR, Hart SL, Liu-Gitz L. Impact of Training Peers and Children with Autism on Social Skills during Center Time Activities in Inclusive Classrooms. Research in Autism Spectrum Disorders. 2010;4(4):619-25. X-3
428. Bansal M, Chan J, Leano R, et al. Effects of perhexiline on myocardial deformation in patients with ischaemic left ventricular dysfunction. Int J Cardiol. 2010 Mar 4;139(2):107-12. PMID: 19840889; X-5
429. Barba L. A one-stop shop for autism services. Behav Healthc. 2010 Jun;30(6):28, 30-1. PMID: 20666201; X-1, X-2, X-3, X-4
430. Baruth JM, Casanova MF, El-Baz A, et al. Low-frequency repetitive transcranial magnetic stimulation modulates evoked-gamma frequency oscillations in autism spectrum disorder. Journal of Neurotherapy. 2010;14(3):179-94. X-1, X-3, X-4
431. Bellini S, McConnell LL. Strength-Based Educational Programming for Students with Autism Spectrum Disorders: A Case for Video Self-Modeling. Preventing School Failure. 2010;54(4):220-7. X-1, X-2, X-3, X-4
432. Belotto KC, Raposo NR, Ferreira AS, et al. Relative bioavailability of two oral formulations of risperidone 2 mg: A single-dose, randomized-sequence, open-label, two-period crossover comparison in healthy Brazilian volunteers. Clin Ther. 2010 Nov;32(12):2106-15. PMID: 21118746; X-5
433. Ben Said M, Robel L, Vion E, et al. TEDIS: an information system dedicated to patients with pervasive developmental disorders. Stud Health Technol Inform. 2010;160(Pt 1):198-202. PMID: 20841677; X-4, X-5
434. Bennett K, Brady MP, Scott J, et al. The Effects of Covert Audio Coaching on the Job Performance of Supported Employees. Focus on Autism and Other Developmental Disabilities. 2010;25(3):173-85. X-5
435. Berry-Kravis E, Raspa M, Loggin-Hester L, et al. Seizures in fragile X syndrome: characteristics and comorbid diagnoses. Am J Intellect Dev Disabil. 2010 Nov;115(6):461-72. PMID: 20945999; X-5
436. Bertoglio K, Jill James S, Deprey L, et al. Pilot study of the effect of methyl B12 treatment on behavioral and biomarker measures in children with autism. J Altern Complement Med. 2010 May;16(5):555-60. PMID: 20804367; X-5
437. Bevan-Brown J. Messages from Parents of Children with Autism Spectrum Disorder (ASD). Kairaranga. 2010;11(2):16-22. X-5
438. Bhatara A, Quintin EM, Levy B, et al. Perception of emotion in musical performance in adolescents with autism spectrum disorders. Autism Res. 2010 Oct;3(5):214-25. PMID: 20717952; X-5
439. Biggs MJG, Simpson C, Gaus MD. Using a Team Approach to Address Bullying of Students with Asperger's Syndrome in Activity-Based Settings. Children & Schools. 2010;32(3):135-42. X-1, X-2, X-3, X-4
440. Bishop DV. Which neurodevelopmental disorders get researched and why? PLoS One. 2010;5(11):e15112. PMID: 21152085; X-5
441. Blacklock K, Perry A. Testing the application of benchmarks for children in Ontario's IBI program: Six case studies. Journal on Developmental Disabilities. 2010;16(2):33-43. X-3
442. Blake KE. Spectrum disorders: a new generation of complex patients. Pa Nurse. 2010 Dec;65(4):9-11, 5. PMID: 21329281; X-5
443. Blardi P, de Lalla A, Ceccatelli L, et al. Variations of plasma leptin and adiponectin levels in autistic patients. Neurosci Lett. 2010 Jul 19;479(1):54-7. PMID: 20478355; X-5
444. Bonell S, McCarthy J. A case study of a young man with intellectual disability, mitochondrial disorder, epilepsy, autism and psychosis: How did we decide which psychotropic drug to use? Advances in Mental Health and Intellectual Disabilities. 2010;4(3):45-8. X-5

445. Bonggat PW, Hall LJ. Evaluation of the Effects of Sensory Integration-Based Intervention by a Preschool Special Education Teacher. Education and Training in Autism and Developmental Disabilities. 2010;45(2):294-302. X-3
446. Bonnel A, McAdams S, Smith B, et al. Enhanced pure-tone pitch discrimination among persons with autism but not Asperger syndrome. Neuropsychologia. 2010 Jul;48(9):2465-75. PMID: 20433857; X-5
447. Boyd BA, Shaw E. Autism in the Classroom: A Group of Students Changing in Population and Presentation. Preventing School Failure. 2010;54(4):211-9. X-5
448. Brambring M, Asbrock D. Validity of false belief tasks in blind children. J Autism Dev Disord. 2010 Dec;40(12):1471-84. PMID: 20379770; X-5
449. Brock M, Hatton D. Distinguishing Features of Autism in Boys with Fragile X Syndrome. Journal of Intellectual Disability Research. 2010;54(10):894-905. X-5
450. Bronnick KS, Nordby H, Larsen JP, et al. Disturbance of automatic auditory change detection in dementia associated with Parkinson's disease: A mismatch negativity study. Neurobiol Aging. 2010 Jan;31(1):104-13. PMID: 18395939; X-5
451. Brookman-Frazee LI, Taylor R, Garland AF. Characterizing community-based mental health services for children with autism spectrum disorders and disruptive behavior problems. J Autism Dev Disord. 2010 Oct;40(10):1188-201. PMID: 20204690; X-5
452. Budzińska A, Wójcik M. Teaching verbal behaviors to a four-year-old autistic boy using techniques of applied behavior analysis. Acta Neuropsychologica. 2010;8(2):181-5. X-3
453. Burke RV, Andersen MN, Bowen SL, et al. Evaluation of two instruction methods to increase employment options for young adults with autism spectrum disorders. Res Dev Disabil. 2010 Nov-Dec;31(6):1223-33. PMID: 20800988; X-5
454. Caballero A, Connell JE. Evaluation of the Effects of Social Cue Cards for Preschool Age Children with Autism Spectrum Disorders (ASD). Journal of Behavior Assessment and Intervention in Children. 2010;1(1):25-42. X-3
455. Caglayan AO. Genetic Causes of Syndromic and Non-Syndromic Autism. Wiley-Blackwell. 350 Main Street, Malden, MA 02148.; 2010. p. 130-8. X-4
456. Canevini MP, De Sarro G, Galimberti CA, et al. Relationship between adverse effects of antiepileptic drugs, number of coprescribed drugs, and drug load in a large cohort of consecutive patients with drug-refractory epilepsy. Epilepsia. 2010 May;51(5):797-804. PMID: 20545754; X-5
457. Capp PL, de Faria ME, Siqueira SR, et al. Special care dentistry: Midazolam conscious sedation for patients with neurological diseases. Eur J Paediatr Dent. 2010 Dec;11(4):162-4. PMID: 21250764; X-5
458. Carbone VJ, Sweeney-Kerwin EJ, Attanasio V, et al. Increasing the Vocal Responses of Children with Autism and Developmental Disabilities Using Manual Sign Mand Training and Prompt Delay. Journal of Applied Behavior Analysis. 2010;43(4):705-9. X-3
459. Carter EW, Sisco LG, Chung Y-C, et al. Peer Interactions of Students with Intellectual Disabilities and/or Autism: A Map of the Intervention Literature. Research and Practice for Persons with Severe Disabilities (RPSD). 2010;35(3):1-17. X-2, X-5
460. Casella SE, Wilder DA, Neidert P, et al. The Effects of Response Effort on Safe Performance by Therapists at an Autism Treatment Facility. Journal of Applied Behavior Analysis. 2010;43(4):729-34. X-1, X-3, X-4
461. Catlett C. Resources within "Reason". Young Exceptional Children. 2010;13(3):41-2. X-5
462. Cesaroni A, Nardi PV. Plasma disc decompression for contained cervical disc herniation: a randomized, controlled trial. Eur Spine J. 2010 Mar;19(3):477-86. PMID: 19902277; X-5
463. Charania SM, LeBlanc LA, Sabanathan N, et al. Teaching effective hand raising to children with autism during group instruction. J Appl Behav Anal. 2010 Fall;43(3):493-7. PMID: 21358908; X-3
464. Charman T. Developmental approaches to understanding and treating autism. Folia Phoniatr Logop. 2010;62(4):166-77. PMID: 20460929; X-5
465. Cheung M-c, Chan AS, Sze SL, et al. Verbal Memory Deficits in Relation to Organization Strategy in High- and Low-Functioning Autistic Children. Research in Autism Spectrum Disorders. 2010;4(4):764-71. X-5
466. Chi RP, Fregni F, Snyder AW. Visual memory improved by non-invasive brain stimulation. Brain Res. 2010 Sep 24;1353:168-75. PMID: 20682299; X-5
467. Chisholm K, Gibbons A, Psarros C, et al. Longitudinal outcomes of early implantation in children with auditory neuropathy spectrum disorder (ANSD). Cochlear Implants Int. 2010 Jun;11 Suppl 1:169-75. PMID: 21756606; X-5
468. Chong IM, Carr JE. Failure to demonstrate the differential outcomes effect in children with autism. Behavioral Interventions. 2010;25(4):339-48. X-3

469. Chow JC, Grigorov GN. Dosimetry of a small air cavity for clinical electron beams: A Monte Carlo study. Med Dosim. 2010 Summer;35(2):92-100. PMID: 19931020; X-5
470. Christon LM, Mackintosh VH, Myers BJ. Use of complementary and alternative medicine (CAM) treatments by parents of children with autism spectrum disorders. Research in Autism Spectrum Disorders. 2010;4(2):249-59. X-4
471. Coakley T. State Guidance Documents for Young Children with Autism Spectrum Disorders: Content and Comparison. Infants and Young Children. 2010;23(2):145-64. X-5
472. Conroy MA. Seeing the Forest among the Trees: When Data Do Not Speak Loud Enough. Journal of Early Intervention. 2010;32(2):99-104. X-5
473. Coolican J, Smith IM, Bryson SE. Brief parent training in pivotal response treatment for preschoolers with autism. J Child Psychol Psychiatry. 2010 Dec;51(12):1321-30. PMID: 21073457; X-3
474. Correa de Sa DD, Hodge DO, Slusser JP, et al. Progression of preclinical diastolic dysfunction to the development of symptoms. Heart. 2010 Apr;96(7):528-32. PMID: 20350989; X-5
475. Cuvo AJ, Godard A, Huckfeldt R, et al. Training children with autism spectrum disorders to be compliant with an oral assessment. Research in Autism Spectrum Disorders. 2010;4(4):681-96. X-3, X-4
476. Cuvo AJ, Reagan AL, Ackerlund J, et al. Training Children with Autism Spectrum Disorders to Be Compliant with a Physical Exam. Research in Autism Spectrum Disorders. 2010;4(2):168-85. X-1, X-3, X-4
477. da Rosa LA, Cardoso SC, Campos LT, et al. Percentage depth dose evaluation in heterogeneous media using thermoluminescent dosimetry. J Appl Clin Med Phys. 2010;11(1):2947. PMID: 20160687; X-5
478. Darrou C, Pry R, Pernon E, et al. Outcome of young children with autism: Does the amount of intervention influence developmental trajectories? Autism. 2010;14(6):663-77. X-5
479. Davis CJ, Brock MD, McNulty K, et al. Efficiency of forced choice preference assessment: Comparing multiple presentation techniques. The Behavior Analyst Today. 2010;10(3-4):440-55. X-5
480. Davis TE, Fodstad JC, Jenkins WS, et al. Anxiety and avoidance in infants and toddlers with autism spectrum disorders: Evidence for differing symptom severity and presentation. Research in Autism Spectrum Disorders. 2010;4(2):305-13. X-5
481. De Schipper JC, Schuengel C. Attachment behaviour towards support staff in young people with intellectual disabilities: associations with challenging behaviour. J Intellect Disabil Res. 2010 Jul;54(7):584-96. PMID: 20492348; X-5
482. Deitchman C, Reeve SA, Reeve KF, et al. Incorporating video feedback into self-management training to promote generalization of social initiations by children with autism. Education & Treatment of Children. 2010;33(3):475-88. X-3
483. Dejong M. Some reflections on the use of psychiatric diagnosis in the looked after or "in care" child population. Clin Child Psychol Psychiatry. 2010 Oct;15(4):589-99. PMID: 20923905; X-5
484. Delfs CH, Campbell JM. A Quantitative Synthesis of Developmental Disability Research: The Impact of Functional Assessment Methodology on Treatment Effectiveness. Behavior Analyst Today. 2010;11(1):4-19. X-1, X-3, X-4
485. Depositario-Cabacar DFT, Zelleke T-G. Treatment of Epilepsy in Children with Developmental Disabilities. Developmental Disabilities Research Reviews. 2010;16(3):239-47. X-1, X-2, X-3, X-4
486. Dichter GS, Benning SD, Holtzclaw TN, et al. Affective modulation of the startle eyeblink and postauricular reflexes in autism spectrum disorder. J Autism Dev Disord. 2010 Jul;40(7):858-69. PMID: 20049632; X-5
487. Dickstein DP. In this issue/abstract thinking: the new normal. J Am Acad Child Adolesc Psychiatry. 2010 Nov;49(11):1087-8. PMID: 20970695; X-5
488. Dillenburger K, Keenan M, Doherty A, et al. Living with Children Diagnosed with Autistic Spectrum Disorder: Parental and Professional Views. British Journal of Special Education. 2010 March 2010;37(1):13-23. X-5
489. Donaldson JB, Zager D. Mathematics Interventions for Students with High Functioning Autism/Asperger's Syndrome. Council for Exceptional Children. 1110 North Glebe Road Suite 300, Arlington, VA 22201.; 2010. p. 40-6. X-4
490. Dowd AM, Rinehart NJ, McGinley J. Motor Function in Children with Autism: Why Is This Relevant to Psychologists? Clinical Psychologist. 2010;14(3):90-6. X-5
491. Downs RC, Downs A. Practices in Early Intervention for Children with Autism: A Comparison with the National Research Council Recommended Practices. Education and Training in Autism and Developmental Disabilities. 2010;45(1):150-9. X-5
492. Draga RO, Grimbergen MC, Kok ET, et al. Photodynamic diagnosis (5-aminolevulinic acid) of transitional cell carcinoma after bacillus Calmette-Guerin immunotherapy and mitomycin C intravesical therapy. Eur Urol. 2010 Apr;57(4):655-60. PMID: 19819064; X-5

493. Dujardin K, Dubois B, Tison F, et al. Parkinson's disease dementia can be easily detected in routine clinical practice. Mov Disord. 2010 Dec 15;25(16):2769-76. PMID: 20925065; X-5
494. Dunst CJ, Trivette CM, Masiello T. Influence of the interests of children with autism on everyday learning opportunities. Psychol Rep. 2010 Aug;107(1):281-8. PMID: 20923073; X-5
495. Eklund M, Ostman M. Belonging and doing: important factors for satisfaction with sexual relations as perceived by people with persistent mental illness. Int J Soc Psychiatry. 2010 Jul;56(4):336-47. PMID: 19617283; X-5
496. Eldevik S, Hastings RP, Hughes JC, et al. Using participant data to extend the evidence base for intensive behavioral intervention for children with autism. American Journal on Intellectual and Developmental Disabilities. 2010;115(5):381-405. X-5
497. Eldib AA, ElGohary MI, Fan J, et al. Dosimetric characteristics of an electron multileaf collimator for modulated electron radiation therapy. J Appl Clin Med Phys. 2010;11(2):2913. PMID: 20592689; X-5
498. Erickson CA, Mullett JE, McDougle CJ. Brief Report: Acamprosate in Fragile X Syndrome. Journal of Autism and Developmental Disorders. 2010 November 2010;40(11):1412-6. X-5
499. Esch JW, Esch BE, McCart JD, et al. An Assessment of Self-Echoic Behavior in Young Children. Analysis of Verbal Behavior. 2010;26:3-13. X-5
500. Falcomata TS, Roane HS, Feeney BJ, et al. Assessment and treatment of elopement maintained by access to stereotypy. J Appl Behav Anal. 2010 Fall;43(3):513-7. PMID: 21358912; X-3
501. Farr W, Yuill N, Raffle H. Social benefits of a tangible user interface for children with Autistic Spectrum Conditions. Autism. 2010 May;14(3):237-52. PMID: 20484323; X-3
502. Fernandes FD, Santos TH, Amato CA, et al. Computerized resources in language therapy with children of the autistic spectrum. Pro Fono. 2010 Oct-Dec;22(4):415-20. PMID: 21271092; X-5
503. Fernell E, Barnevik-Olsson M, Bågenholm G, et al. Serum levels of 25-hydroxyvitamin D in mothers of Swedish and of Somali origin who have children with and without autism. Acta Paediatrica. 2010;99(5):743-7. X-5
504. Finnigan E, Starr E. Increasing Social Responsiveness in a Child with Autism: A Comparison of Music and Non-Music Interventions. Autism: The International Journal of Research and Practice. 2010;14(4):321-48. X-3
505. Fischer JL, Howard JS, Sparkman CR, et al. Establishing generalized syntactical responding in young children with autism. Research in Autism Spectrum Disorders. 2010;4(1):76-88. X-3
506. Flood WA, Lynn C, Mortensen J, et al. Behavioral assessment of an elimination diet to treat purported food sensitivity and problem behaviors in autism: A clinical case report. the Behavior Therapist. 2010;33(6):116-9. X-5
507. Forsyth R, McNally R, James P, et al. Variation at local government level in the support for families of severely disabled children and the factors that affect it. Dev Med Child Neurol. 2010 Nov;52(11):e259-66. PMID: 21175456; X-5
508. Frazier TW, Youngstrom EA, Haycook T, et al. Effectiveness of medication combined with intensive behavioral intervention for reducing aggression in youth with autism spectrum disorder. J Child Adolesc Psychopharmacol. 2010 Jun;20(3):167-77. PMID: 20578929; X-1, X-3
509. Frazier TW, Youngstrom EA, Sinclair L, et al. Autism spectrum disorders as a qualitatively distinct category from typical behavior in a large, clinically ascertained sample. Assessment. 2010;17(3):308-20. X-5
510. Friman PC. Come on in, the Water Is Fine: Achieving Mainstream Relevance through Integration with Primary Medical Care. Behavior Analyst. 2010;33(1):19-36. X-5
511. Furniss GJ. Reflections on the Historical Narrative of Jessica Park, an Artist with Autism. Art Therapy: Journal of the American Art Therapy Association. 2010;27(4):190-4. X-5
512. Gage NA, Lewis TJ. Structural Analysis in the Classroom. Beyond Behavior. 2010;19(3):3-11. X-1, X-2, X-3, X-4
513. Gaita L, Manzi B, Sacco R, et al. Decreased serum arylesterase activity in autism spectrum disorders. Psychiatry Research. 2010;180(2-3):105-13. X-5
514. Gallagher CM, Goodman MS. Hepatitis B vaccination of male neonates and autism diagnosis, NHIS 1997-2002. J Toxicol Environ Health A. 2010;73(24):1665-77. PMID: 21058170; X-5
515. Ganz JB, Flores MM. Implementing Visual Cues for Young Children with Autism Spectrum Disorders and Their Classmates. Young Children. 2010 May 2010;65(3):78-83. X-5
516. Ganz JB, Lashley E, Rispoli MJ. Non-responsiveness to intervention: children with autism spectrum disorders who do not rapidly respond to communication interventions. Dev Neurorehabil. 2010;13(6):399-407. PMID: 21034281; X-3
517. Garcia-Villamisar DA, Dattilo J. Effects of a leisure programme on quality of life and stress of individuals with ASD. J Intellect Disabil Res. 2010 Jul;54(7):611-9. PMID: 20500784; X-5

518. Gau SS-F, Chou M-C, Lee J-C, et al. Behavioral problems and parenting style among Taiwanese children with autism and their siblings. Psychiatry and Clinical Neurosciences. 2010;64(1):70-8. X-5
519. Gerritsen J. The Effect of Tomatis Therapy on Children with Autism: Eleven Case Studies. International Journal of Listening. 2010;24(1):50-68. X-1, X-2, X-3, X-4
520. Ghanizadeh A. Methionine sulfoximine may improve inflammation in autism, a novel hypothesized treatment for autism. Arch Med Res. 2010 Nov;41(8):651-2. PMID: 21199736; X-1, X-2, X-3, X-4
521. Gjaerum RG, Ineland J, Sauer L. The story about theater organizations, the public's approval, and the actors' identity formation in Nordic disability theater. J Soc Work Disabil Rehabil. 2010;9(4):254-73. PMID: 21104515; X-4, X-5
522. Granpeesheh D, Tarbox J, Dixon DR, et al. Evaluation of an eLearning tool for training behavioral therapists in academic knowledge of applied behavior analysis. Research in Autism Spectrum Disorders. 2010;4(1):11-7. X-5
523. Granpeesheh D, Tarbox J, Dixon DR, et al. Randomized trial of hyperbaric oxygen therapy for children with autism. Research in Autism Spectrum Disorders. 2010;4(2):268-75. X-5
524. Green SA, Ben-Sasson A. Anxiety Disorders and Sensory Over-Responsivity in Children with Autism Spectrum Disorders: Is There a Causal Relationship? Journal of Autism and Developmental Disorders. 2010;40(12):1495-504. X-5
525. Greher GR, Hillier A, Dougherty M, et al. SoundScape: An Interdisciplinary Music Intervention for Adolescents and Young Adults on the Autism Spectrum. International Journal of Education & the Arts. 2010;11(9):1-28. X-5
526. Grey I, Bradley S, McClean B. Patterns of autism diagnostic assessment in Ireland. The Irish Journal of Psychology. 2010;31(1-4):27-42. X-5
527. Grey I, Lynn E, McClean B. Parents of children with autism: Experiences of education service provision in the Republic of Ireland. The Irish Journal of Psychology. 2010;31(1-4):111-24. X-4
528. Groskreutz NC, Karsina A, Miguel CF, et al. Using Complex Auditory-Visual Samples to Produce Emergent Relations in Children with Autism. Journal of Applied Behavior Analysis. 2010;43(1):131-6. X-3, X-5
529. Guldberg K. Educating Children on the Autism Spectrum: Preconditions for Inclusion and Notions of "Best Autism Practice" in the Early Years. British Journal of Special Education. 2010;37(4):168-74. X-5
530. Gunby KV, Carr JE, LeBlanc LA. Teaching Abduction-Prevention Skills to Children with Autism. Journal of Applied Behavior Analysis. 2010;43(1):107-12. X-3
531. Gunnar MR. A Commentary on "Deprivation-Specific Psychological Patterns: Effects of Institutional Deprivation". Monographs of the Society for Research in Child Development. 2010;75(1):232-47. X-5
532. Gupta S. Antibodies: basic mechanisms and emerging concepts. J Clin Immunol. 2010 May;30 Suppl 1:S1-3. PMID: 20387105; X-5
533. Gutman SA, Raphael EI, Ceder LM, et al. The effect of a motor-based, social skills intervention for adolescents with high-functioning autism: Two single-subject design cases. Occupational Therapy International. 2010;17(4):188-97. X-5
534. Haley JL, Heick PF, Luiselli JK. Use of an Antecedent Intervention to Decrease Vocal Stereotypy of a Student with Autism in the General Education Classroom. Child & Family Behavior Therapy. 2010;32(4):311-21. X-3
535. Halko MA, Eldaief MC, Horvath JC, et al. Combining transcranial magnetic stimulation and FMRI to examine the default mode network. J Vis Exp. 2010(46)PMID: 21248684; X-3, X-4, X-5
536. Hamad CD, Serna RW, Morrison L, et al. Extending the Reach of Early Intervention Training for Practitioners: A Preliminary Investigation of an Online Curriculum for Teaching Behavioral Intervention Knowledge in Autism to Families and Service Providers. Infants and Young Children. 2010;23(3):195-208. X-5
537. Hammond D, Gast DL. Descriptive Analysis of Single Subject Research Designs: 1983-2007. Education and Training in Autism and Developmental Disabilities. 2010;45(2):187-202. X-5
538. Harish T, Gangadharan S, Bhaumik S, et al. Adults with Asperger syndrome at a Neuropsychiatric Centre in India. British Journal of Developmental Disabilities. 2010;56(111, Pt2):159-65. X-5
539. Hayashi N, Shibamoto Y, Obata Y, et al. Megavoltage photon beam attenuation by carbon fiber couch tops and its prediction using correction factors. J Radiat Res. 2010;51(4):455-63. PMID: 20508376; X-5
540. Hedley D, Young R, Angelica M, et al. Cross-cultural evaluation of the Autism Detection in Early Childhood (ADEC) in Mexico. Autism. 2010;14(2):93-112. X-5
541. Heinicke MR, Carr JE, LeBlanc LA, et al. On the Use of Fluency Training in the Behavioral Treatment of Autism: A Commentary. Behavior Analyst. 2010;33(2):223-9. X-2, X-5
542. Hellings JA, Cardona AM, Schroeder SR. Long-term safety and adverse events of risperidone in children, adolescents, and adults with pervasive developmental disorders. Journal of Mental Health Research in Intellectual Disabilities. 2010;3(3):132-44. X-1

543. Henning OJ, Nakken KO. Psychiatric comorbidity and use of psychotropic drugs in epilepsy patients. Acta Neurol Scand Suppl. 2010(190):18-22. PMID: 20586730; X-5
544. Hess J, Matson J, Neal D, et al. A Comparison of Psychotropic Drug Side Effect Profiles in Adults Diagnosed with Intellectual Disabilities and Autism Spectrum Disorders. Journal of Mental Health Research in Intellectual Disabilities. 2010;3(2):85-96. X-5
545. Hintzen A, Delespaul P, van Os J, et al. Social needs in daily life in adults with Pervasive Developmental Disorders. Psychiatry Res. 2010 Aug 30;179(1):75-80. PMID: 20638732; X-5
546. Hobson RP. Explaining autism: Ten reasons to focus on the developing self. Autism. 2010 Sep;14(5):391-407. PMID: 20926456; X-5
547. Hoekstra PJ, Troost PW, Lahuis BE, et al. Risperidone-induced weight gain in referred children with autism spectrum disorders is associated with a common polymorphism in the 5-hydroxytryptamine 2C receptor gene. J Child Adolesc Psychopharmacol. 2010 Dec;20(6):473-7. PMID: 21186965; X-5
548. Hoglund Carlsson L, Gillberg C, Lannero E, et al. Autism: screening toddlers with CHAT in a child health care programme did not improve early identification. Acta Paediatr. 2010 Dec;99(12):1897-9. PMID: 20670307; X-5
549. Holifield C, Goodman J, Hazelkorn M, et al. Using Self-Monitoring to Increase Attending to Task and Academic Accuracy in Children with Autism. Focus on Autism and Other Developmental Disabilities. 2010;25(4):230-8. X-3
550. Holland CD. Autism, insurance, and the idea: providing a comprehensive legal framework. Cornell Law Rev. 2010 Sep;95(6):1253-82. PMID: 20939148; X-5
551. Hollenweger J. MHADIE's matrix to analyse the functioning of education systems. Disabil Rehabil. 2010;32 Suppl 1:S116-24. PMID: 20874661; X-5
552. Hui KK, Marina O, Liu J, et al. Acupuncture, the limbic system, and the anticorrelated networks of the brain. Auton Neurosci. 2010 Oct 28;157(1-2):81-90. PMID: 20494627; X-5
553. Humphrey N, Symes W. Responses to Bullying and Use of Social Support among Pupils with Autism Spectrum Disorders (ASDs) in Mainstream Schools: A Qualitative Study. Journal of Research in Special Educational Needs. 2010;10(2):82-90. X-3, X-4
554. Hutman T, Rozga A, DeLaurentis AD, et al. Response to Distress in Infants at Risk for Autism: A Prospective Longitudinal Study. Journal of Child Psychology and Psychiatry. 2010;51(9):1010-20. X-5
555. Iarocci G, Rombough A, Yager J, et al. Visual influences on speech perception in children with autism. Autism. 2010 Jul;14(4):305-20. PMID: 20591957; X-4
556. Ingersoll B, Lalonde K. The impact of object and gesture imitation training on language use in children with autism spectrum disorder. J Speech Lang Hear Res. 2010 Aug;53(4):1040-51. PMID: 20631228; X-3
557. Jackett JM. Transition and beyond for individuals with autism spectrum disorders (ASD): a New Jersey case study of the adult service sector, its inherent shortcomings, and hope for the future. Seton Hall Law Rev. 2010;40(4):1733-74. PMID: 21280391; X-5
558. James WH. Behavioural and biological determinants of human sex ratio at birth. J Biosoc Sci. 2010 Sep;42(5):587-99. PMID: 20519063; X-5
559. Janusis GM, Weyandt LL. An exploratory study of substance use and misuse among college students with and without ADHD and other disabilities. J Atten Disord. 2010 Nov;14(3):205-15. PMID: 20479474; X-5
560. Jeanson B, Thiessen C, Thomson K, et al. Field testing of the discrete-trials teaching evaluation form. Research in Autism Spectrum Disorders. 2010;4(4):718-23. X-5
561. Jegatheesan B, Fowler S, Miller PJ. From symptom recognition to services: How South Asian Muslim immigrant families navigate autism. Disability & Society. 2010;25(7):797-811. X-3, X-4
562. Jones AP, Frederickson N. Multi-informant predictors of social inclusion for students with Autism spectrum disorders attending mainstream school. Journal of Autism and Developmental Disorders. 2010;40(9):1094-103. X-5
563. Jones K, Howley M. An investigation into an interaction programme for children on the autism spectrum: Outcomes for children, perceptions of schools and a model for training. Journal of Research in Special Educational Needs. 2010;10(2):115-23. X-3, X-4
564. Joshi G, Petty C, Wozniak J, et al. The heavy burden of psychiatric comorbidity in youth with autism spectrum disorders: a large comparative study of a psychiatrically referred population. J Autism Dev Disord. 2010 Nov;40(11):1361-70. PMID: 20309621; X-5
565. Kagohara DM, van der Meer L, Achmadi D, et al. Behavioral intervention promotes successful use of an iPod-based communication device by an adolescent with autism. Clinical Case Studies. 2010;9(5):328-38. X-5
566. Kalyva E. Teachers Perspectives of the Sexuality of Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2010;4(3):433-7. X-5

567. Kane M, Connell JE, Pellecchia M. A Quantitative Analysis of Language Interventions for Children with Autism. Behavior Analyst Today. 2010;11(2):128-44. X-5
568. Kang S, Lang RB, O'Reilly MF, et al. Problem Behavior during Preference Assessments: An Empirical Analysis and Practical Recommendations. Journal of Applied Behavior Analysis. 2010;43(1):137-41. X-3, X-5
569. Kao HSR. Calligraphy therapy: A complementary approach to psychotherapy. Asia Pacific Journal of Counselling and Psychotherapy. 2010;1(1):55-66. X-1, X-2, X-3, X-4
570. Karanth P, Shaista S, Srikanth N. Efficacy of communication DEALL--an indigenous early intervention program for children with autism spectrum disorders. Indian J Pediatr. 2010 Sep;77(9):957-62. PMID: 20821283; X-5
571. Karkhaneh M, Clark B, Ospina MB, et al. Social Stories(TM) to improve social skills in children with Autism spectrum disorder. A systematic review. Autism. 2010;14(6):641-62. X-5
572. Katagiri M, Inada N, Kamio Y. Mirroring Effect in 2- and 3-Year-Olds with Autism Spectrum Disorder. Research in Autism Spectrum Disorders. 2010;4(3):474-8. X-5
573. Kawanabe T, Yoritaka A, Shimura H, et al. Successful treatment with Yokukansan for behavioral and psychological symptoms of Parkinsonian dementia. Prog Neuropsychopharmacol Biol Psychiatry. 2010 Mar 17;34(2):284-7. PMID: 19948198; X-5
574. Keenan M, Dillenburger K, Doherty A, et al. The Experiences of Parents during Diagnosis and Forward Planning for Children with Autism Spectrum Disorder. Journal of Applied Research in Intellectual Disabilities. 2010;23(4):390-7. X-5
575. Kelley E, Naigles L, Fein D. An In-Depth Examination of Optimal Outcome Children with a History of Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2010;4(3):526-38. X-5
576. Kenworthy L, Case L, Harms MB, et al. Adaptive Behavior Ratings Correlate with Symptomatology and IQ among Individuals with High-Functioning Autism Spectrum Disorders. Journal of Autism and Developmental Disorders. 2010;40(4):416-23. X-5
577. Kerns KA, MacSween J, Vander Wekken S, et al. Investigating the efficacy of an attention training programme in children with foetal alcohol spectrum disorder. Developmental Neurorehabilitation. 2010;13(6):413-22. X-5
578. Kim JE, Lyoo IK, Estes AM, et al. Laterobasal amygdalar enlargement in 6- to 7-year-old children with autism spectrum disorder. Archives of General Psychiatry. 2010;67(11):1187-97. X-5
579. Koegel LK, Singh AK, Koegel RL. Improving motivation for academics in children with autism. J Autism Dev Disord. 2010 Sep;40(9):1057-66. PMID: 20221791; X-3
580. Koh M-s, Shin S, Yeo M-H. The Learning Program for the Development of Autistic Children (LPDAC): Parents' Perspectives on the Treatment Outcomes. Journal of the International Association of Special Education. 2010;11(1):92-100. X-4
581. Konstantareas M, Rios A, Ramnarace C. Intensive Behavioural Intervention (IBI) training: Cooperation and its relationship to language and social competence in children with Autism Spectrum Disorder (ASD). Journal on Developmental Disabilities. 2010;16(2):67-8. X-5
582. Koshelev M, Lohrenz T, Vannucci M, et al. Biosensor approach to psychopathology classification. PLoS Comput Biol. 2010;6(10):e1000966. PMID: 20975934; X-5
583. Kramberger MG, Stukovnik V, Cus A, et al. Parkinson's disease dementia: clinical correlates of brain spect perfusion and treatment. Psychiatr Danub. 2010 Sep;22(3):446-9. PMID: 20856190; X-5
584. Krause M, Vainio L, Zwetchkenbaum S, et al. Dental education about patients with special needs: a survey of U.S. and Canadian dental schools. J Dent Educ. 2010 Nov;74(11):1179-89. PMID: 21045222; X-5
585. Kroeger K, Sorensen R. A Parent Training Model for Toilet Training Children with Autism. Journal of Intellectual Disability Research. 2010;54(6):556-67. X-3
586. Kuhlthau K, Orlich F, Hall TA, et al. Health-Related Quality of Life in children with autism spectrum disorders: results from the autism treatment network. J Autism Dev Disord. 2010 Jun;40(6):721-9. PMID: 20033762; X-5
587. Kuhn G, Kourkoulou A, Leekam SR. How magic changes our expectations about autism. Psychol Sci. 2010 Oct;21(10):1487-93. PMID: 20855904; X-5
588. Kumsta R, Kreppner J, Rutter M, et al. Deprivation-Specific Psychological Patterns. Monographs of the Society for Research in Child Development. 2010;75(1):48-78. X-5
589. Kutup A, Vashist Y, Kaifi JT, et al. For which type of chronic pancreatitis is the "Hamburg procedure" indicated? J Hepatobiliary Pancreat Sci. 2010 Nov;17(6):758-62. PMID: 19779663; X-5

590. LaCava PG, Rankin A, Mahlios E, et al. A single case design evaluation of a software and tutor intervention addressing emotion recognition and social interaction in four boys with ASD. Autism. 2010 May;14(3):161-78. PMID: 20488823; X-3
591. Lake JK, Cardy S, Humphreys KR. Brief report: Animacy and word order in individuals with autism spectrum disorders. Journal of Autism and Developmental Disorders. 2010;40(9):1161-4. X-5
592. Lal R. Effect of Alternative and Augmentative Communication on Language and Social Behavior of Children with Autism. Educational Research and Reviews. 2010;5(3):119-25. X-3
593. Lam SF, Wong BP, Leung D, et al. How parents perceive and feel about participation in community activities. The comparison between parents of preschoolers with and without Autism Spectrum Disorders. Autism. 2010 Jul;14(4):359-77. PMID: 20591960; X-5
594. Lang R, Davis T, O'Reilly M, et al. Functional Analysis and Treatment of Elopement across Two School Settings. Journal of Applied Behavior Analysis. 2010;43(1):113-8. X-3
595. Lang R, Koegel LK, Ashbaugh K, et al. Physical Exercise and Individuals with Autism Spectrum Disorders: A Systematic Review. Research in Autism Spectrum Disorders. 2010;4(4):565-76. X-1, X-3, X-4
596. Lang R, O'Reilly M, Sigafoos J, et al. The effects of an abolishing operation intervention component on play skills, challenging behavior, and stereotypy. Behavior Modification. 2010;34(4):267-89. X-3
597. Lang R, O'Reilly MF, Sigafoos J, et al. Review of Teacher Involvement in the Applied Intervention Research for Children with Autism Spectrum Disorders. Education and Training in Autism and Developmental Disabilities. 2010;45(2):268-83. X-2, X-5
598. Lanner T, Nichols B, Field S, et al. The clinical utility of two reinforcement preference assessment techniques: A comparison of duration of assessment and identification of functional reinforcers. The Behavior Analyst Today. 2010;10(3-4):456-66. X-1, X-3
599. Larsson V, Aarsland D, Ballard C, et al. The effect of memantine on sleep behaviour in dementia with Lewy bodies and Parkinson's disease dementia. Int J Geriatr Psychiatry. 2010 Oct;25(10):1030-8. PMID: 20872929; X-5
600. Lazoff T, Zhong L, Piperni T, et al. Prevalence of pervasive developmental disorders among children at the English Montreal School Board. The Canadian Journal of Psychiatry / La Revue canadienne de psychiatrie. 2010;55(11):715-20. X-5
601. Leaf JB, Sheldon JB, Sherman JA. Comparison of Simultaneous Prompting and No-No Prompting in Two-Choice Discrimination Learning with Children with Autism. Journal of Applied Behavior Analysis. 2010;43(2):215-28. X-3
602. Lechago SA, Carr JE, Grow LL, et al. Mands for Information Generalize across Establishing Operations. Journal of Applied Behavior Analysis. 2010;43(3):381-95. X-3
603. Lee CY, Kim KH, Kim YH. The efficacy of photodynamic diagnosis in defining the lateral border between a tumor and a tumor-free area during Mohs micrographic surgery. Dermatol Surg. 2010 Nov;36(11):1704-10. PMID: 20840493; X-5
604. Legge DB, DeBar RM, Alber-Morgan SR. The Effects of Self-Monitoring with a MotivAider[R] on the On-Task Behavior of Fifth and Sixth Graders with Autism and Other Disabilities. Journal of Behavior Assessment and Intervention in Children. 2010;1(1):43-52. X-3
605. Lemonnier E, Ben-Ari Y. The diuretic bumetanide decreases autistic behaviour in five infants treated during 3 months with no side effects. Acta Paediatr. 2010 Dec;99(12):1885-8. PMID: 20608900; X-3, X-5
606. Lionello-DeNolf KM, Dube WV, McIlvane WJ. Evaluation of Resistance to Change under Different Disrupter Conditions in Children with Autism and Severe Intellectual Disability. Journal of the Experimental Analysis of Behavior. 2010;93(3):369-83. X-3
607. Livanis A, Mouzakitis A. The Treatment Validity of Autism Screening Instruments. Assessment for Effective Intervention. 2010;35(4):206-17. X-5
608. Locke J, Ishijima EH, Kasari C, et al. Loneliness, Friendship Quality and the Social Networks of Adolescents with High-Functioning Autism in an Inclusive School Setting. Journal of Research in Special Educational Needs. 2010;10(2):74-81. X-5
609. Loiacono V, Valenti V. General Education Teachers Need to Be Prepared to Co-Teach the Increasing Number of Children with Autism in Inclusive Settings. International Journal of Special Education. 2010;25(3):24-32. X-5
610. Lomas JE, Fisher WW, Kelley ME. The effects of variable-time delivery of food items and praise on problem behavior reinforced by escape. J Appl Behav Anal. 2010 Fall;43(3):425-35. PMID: 21358903; X-3
611. Lund C, Oosthuizen P, Flisher AJ, et al. Care among people with schizophrenia spectrum disorders in South Africa. Psychiatric Services. 2010;61(3):235-40. X-5
612. Lynch E. Making sense of autism. Nurs Stand. 2010 Sep 15-21;25(2):18-9. PMID: 20949817; X-5

613. Machalicek W, O'Reilly MF, Rispoli M, et al. Training Teachers to Assess the Challenging Behaviors of Students with Autism Using Video Tele-Conferencing. Education and Training in Autism and Developmental Disabilities. 2010;45(2):203-15. X-5
614. Maenner MJ, Durkin MS. Trends in the prevalence of autism on the basis of special education data. Pediatrics. 2010 Nov;126(5):e1018-25. PMID: 20974790; X-5
615. Mahoney JF. Interrater agreement on the Nordoff-Robbins Evaluation Scale I: Client-therapist relationship in musical activity. Music and Medicine. 2010;2(1):23-8. X-5
616. Majewska MD, Urbanowicz E, Rok-Bujko P, et al. Age-dependent lower or higher levels of hair mercury in autistic children than in healthy controls. Acta Neurobiol Exp (Wars). 2010;70(2):196-208. PMID: 20628443; X-5
617. Makrygianni MK, Reed P. A Meta-Analytic Review of the Effectiveness of Behavioural Early Intervention Programs for Children with Autistic Spectrum Disorders. 2010;4:577-93. X-5
618. Makrygianni MK, Reed P. Factors Impacting on the Outcomes of Greek Intervention Programmes for Children with Autistic Spectrum Disorders. Research in Autism Spectrum Disorders. 2010 2010;4(4):697-708. X-5
619. Mancil RG, Boman M. Functional Communication Training in the Classroom: A Guide for Success. Preventing School Failure. 2010;54(4):238-46. X-1, X-2, X-3, X-4
620. Mandell DS, Morales KH, Xie M, et al. Age of diagnosis among Medicaid-enrolled children with autism, 2001-2004. Psychiatr Serv. 2010 Aug;61(8):822-9. PMID: 20675842; X-5
621. Mandell DS, Morales KH, Xie M, et al. County-Level Variation in the Prevalence of Medicaid-Enrolled Children with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders. 2010;40(10):1241-6. X-5
622. Manente CJ, Maraventano JC, LaRue RH, et al. Effective Behavioral Intervention for Adults on the Autism Spectrum: Best Practices in Functional Assessment and Treatment Development. Behavior Analyst Today. 2010;11(1):36-48. X-5
623. Marchetto MC, Carromeu C, Acab A, et al. A model for neural development and treatment of Rett syndrome using human induced pluripotent stem cells. Cell. 2010 Nov 12;143(4):527-39. PMID: 21074045; X-5
624. Marcus A, Sinnott B, Bradley S, et al. Treatment of idiopathic toe-walking in children with autism using GaitSpot Auditory Speakers and simplified habit reversal. Research in Autism Spectrum Disorders. 2010;4(2):260-7. X-3
625. Marder K. Cognitive impairment and dementia in Parkinson's disease. Mov Disord. 2010;25 Suppl 1:S110-6. PMID: 20187235; X-5
626. Martens BK, Gertz LE, de Lacy Werder CS, et al. Agreement between descriptive and experimental analyses of behavior under naturalistic test conditions. Journal of Behavioral Education. 2010;19(3):205-21. X-3, X-5
627. Matson JL, Fodstad JC, Mahan S, et al. Cut-offs, norms and patterns of problem behaviours in children with developmental disabilities on the Baby and Infant Screen for Children with aUtIsm Traits (BISCUIT-Part 3). Developmental Neurorehabilitation. 2010;13(1):3-9. X-5
628. Matson JL, Hess JA, Boisjoli JA. Comorbid psychopathology in infants and toddlers with autism and pervasive developmental disorders-not otherwise specified (PDD-NOS). Research in Autism Spectrum Disorders. 2010;4(2):300-1. X-5
629. Matson JL, Mahan S, Kozlowski AM, et al. Developmental milestones in toddlers with autistic disorder, pervasive developmental disorder—not otherwise specified and atypical development. Developmental Neurorehabilitation. 2010;13(4):239-47. X-5
630. Matson JL, Mahan S, Sipes M, et al. Effects of Symptoms of Comorbid Psychopathology on Challenging Behaviors among Atypically Developing Infants and Toddlers as Assessed with the Baby and Infant Screen for Children with Autism Traits (BISCUIT). Journal of Mental Health Research in Intellectual Disabilities. 2010;3(3):164-76. X-5
631. Matson JL, Neal D. Differentiating Communication Disorders and Autism in Children. Research in Autism Spectrum Disorders. 2010;4(4):626-32. X-5
632. Matsuo M, Maeda T, Sasaki K, et al. Frequent association of autism spectrum disorder in patients with childhood onset epilepsy. Brain Dev. 2010 Oct;32(9):759-63. PMID: 20542395; X-5
633. Matsushita H, Sonoyama S. Teaching ball-throwing skills to a boy with Asperger's disorder: A case study. Japanese Journal of Special Education. 2010;47(6):495-508. X-3
634. Mayoral M, Merchán-Naranjo J, Rapado M, et al. Neurological soft signs in juvenile patients with Asperger syndrome, early-onset psychosis, and healthy controls. Early Intervention in Psychiatry. 2010;4(4):283-90. X-5
635. Mayton MR, Wheeler JJ, Menendez AL, et al. An analysis of evidence-based practices in the education and treatment of learners with autism spectrum disorders. Education and Training in Autism and Developmental Disabilities. 2010;45(4):539-51. X-1, X-3, X-4

636. Mazurik-Charles R, Stefanou C. Using Paraprofessionals to Teach Social Skills to Children with Autism Spectrum Disorders in the General Education Classroom. Journal of Instructional Psychology. 2010;37(2):161-9. X-3
637. McCoy KM, Mathur RS, Czoka A. Guidelines for Creating a Transition Routine: Changing from One Room to Another. Beyond Behavior. 2010;19(3):22-9. X-3
638. McDuffie A, Yoder P. Types of parent verbal responsiveness that predict language in young children with autism spectrum disorder. J Speech Lang Hear Res. 2010 Aug;53(4):1026-39. PMID: 20605942; X-5
639. McGinnis MA, Houchins-Juarez N, McDaniel JL, et al. Abolishing and Establishing Operation Analyses of Social Attention as Positive Reinforcement for Problem Behavior. Journal of Applied Behavior Analysis. 2010;43(1):119-23. X-3, X-5
640. McGuinness TM, Lewis S. Update on autism and vaccines. J Psychosoc Nurs Ment Health Serv. 2010 Jun;48(6):15-8. PMID: 20506968; X-5
641. Meguid NA, Hashish AF, Anwar M, et al. Reduced serum levels of 25-hydroxy and 1,25-dihydroxy vitamin D in Egyptian children with autism. The Journal of Alternative and Complementary Medicine. 2010;16(6):641-5. X-5
642. Milo J-S, Mace CF, Nevin JA. The Effects of Constant versus Varied Reinforcers on Preference and Resistance to Change. Journal of the Experimental Analysis of Behavior. 2010;93(3):385-94. X-3
643. Mitchel K, Regehr K, Reaume J, et al. Group social skills training for adolescents with Asperger Syndrome or high functioning autism. Journal on Developmental Disabilities. 2010;16(2):52-63. X-5
644. Miyahara M, Ruffman T, Fujita C, et al. How Well Can Young People with Asperger's Disorder Recognize Threat and Learn about Affect in Faces?: A Pilot Study. Research in Autism Spectrum Disorders. 2010;4(2):242-8. X-5
645. Molinari JA. Vaccination: science versus perception. Dent Today. 2010 Dec;29(12):84, 6. PMID: 21229925; X-5
646. Molloy CA, Kalkwart HJ, Manning-Courtney P, et al. Plasma 25(OH)D concentration in children with autism spectrum disorder. Developmental Medicine & Child Neurology. 2010;52(10):969-71. X-4
647. Montgomery JM, McCrimmon AW, Schwean VL, et al. Emotional Intelligence in Asperger Syndrome: Implications of Dissonance between Intellect and Affect. Education and Training in Autism and Developmental Disabilities. 2010;45(4):566-82. X-5
648. Moores-Abdool W. d Students with Autism and Access to General Curriculum: What Is Being Provided? Issues in Teacher Education. 2010;19(2):153-69. X-5
649. Moree BN, Davis TE. Cognitive-Behavioral Therapy for Anxiety in Children Diagnosed with Autism Spectrum Disorders: Modification Trends. Research in Autism Spectrum Disorders. 2010;4(3):346-54. X-1, X-2, X-3, X-4
650. Morrison A, Bickerstaff D, Taylor BJ. Referrals to a learning disability social work team 1996 to 2005. British Journal of Learning Disabilities. 2010;38(3):168-74. X-5
651. Morse TE. Comprehensive Special Education Programming for Students with Autism Spectrum Disorder in the United States. International Journal of Educational Reform. 2010 2010;19(1):2-13. X-2, X-5
652. Mostert MP. Facilitated Communication and Its Legitimacy--Twenty-First Century Developments. Exceptionality. 2010 2010;18(1):31-41. X-5
653. Mothander PR, Moe RG. Self-reported depressive symptoms and parental stress in mothers and fathers who bring their infants to an infant mental health clinic. Nord J Psychiatry. 2010 Oct;64(5):310-6. PMID: 20184497; X-5
654. Murphy C, Barnes-Holmes D. Establishing five derived mands in three adolescent boys with autism. J Appl Behav Anal. 2010 Fall;43(3):537-41. PMID: 21358916; X-5
655. Murphy D. Extreme violence in a man with an autistic spectrum disorder: Assessment and treatment within high-security psychiatric care. Journal of Forensic Psychiatry & Psychology. 2010;21(3):462-77. X-5
656. Napolitano DA, Smith T, Zarcone JR, et al. Increasing Response Diversity in Children with Autism. Journal of Applied Behavior Analysis. 2010;43(2):265-71. X-3, X-5
657. Neitzel J. Positive Behavior Supports for Children and Youth with Autism Spectrum Disorders. Preventing School Failure. 2010;54(4):247-55. X-1, X-2, X-3, X-4
658. Nepo KG. The Use of Technology to Improve Staff Performance. International Journal of Behavioral Consultation and Therapy. 2010;6(2):134-41. X-5
659. Neumann N, Dubischar-Krivec AM, Braun C, et al. The mind of the mnemonists: An MEG and neuropsychological study of autistic memory savants. Behavioural Brain Research. 2010;215(1):114-21. X-3, X-5
660. Nevelsky A, Bernstein Z, Bar-Deroma R, et al. Design and dosimetry characteristics of a commercial applicator system for intra-operative electron beam therapy utilizing ELEKTA Precise accelerator. J Appl Clin Med Phys. 2010;11(4):3244. PMID: 21081880; X-5

661. Nigro-Bruzzi D, Sturmey P. The effects of behavioral skills training on mand training by staff and unprompted vocal mands by children. J Appl Behav Anal. 2010 Winter;43(4):757-61. PMID: 21541162; X-3
662. Noterdaeme M, Hutzelmeyer-Nickels A. Early symptoms and recognition of pervasive developmental disorders in Germany. Autism. 2010 Nov;14(6):575-88. PMID: 20923894; X-5
663. Oberman LM, Horvath JC, Pascual-Leone A. TMS: using the theta-burst protocol to explore mechanism of plasticity in individuals with Fragile X syndrome and autism. J Vis Exp. 2010(46)PMID: 21248685; X-5
664. O'Connor AB, Healy O. Long-Term Post-Intensive Behavioral Intervention Outcomes for Five Children with Autism Spectrum Disorder. Research in Autism Spectrum Disorders. 2010;4(4):594-604. X-3
665. Odom SL, Boyd BA, Hall LJ, et al. Evaluation of Comprehensive Treatment Models for Individuals with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders. 2010;40(4):425-36. X-5
666. Odom SL, Collet-Klingenberg L, Rogers SJ, et al. Evidence-Based Practices in Interventions for Children and Youth with Autism Spectrum Disorders. Preventing School Failure. 2010;54(4):275-82. X-1, X-3 ,X-4
667. O'Hearn K, Schroer E, Minshew N, et al. Lack of Developmental Improvement on a Face Memory Task during Adolescence in Autism. Neuropsychologia. 2010;48(13):3955-60. X-3, X-4
668. Ohtake Y, Wehmeyer M, Uchida N, et al. Enabling a Prelinguistic Communicator with Autism to Use Picture Card as a Strategy for Repairing Listener Misunderstandings: A Case Study. Education and Training in Autism and Developmental Disabilities. 2010;45(3):410-21. X-3
669. Oi M. Do Japanese children with high-functioning autism spectrum disorder respond differently to Wh-questions and Yes/No-questions? Clinical Linguistics & Phonetics. 2010;24(9):691-705. X-5
670. Okada S, Ohtake Y, Yanagihara M. Improving the Manners of a Student with Autism: The Effects of Manipulating Perspective Holders in Social Stories[TM]--A Pilot Study. International Journal of Disability, Development and Education. 2010 June 2010;57(2):207-19. X-3
671. Olatunji BO, Cisler JM, Deacon BJ. Efficacy of cognitive behavioral therapy for anxiety disorders: a review of meta-analytic findings. Psychiatr Clin North Am. 2010 Sep;33(3):557-77. PMID: 20599133; X-5
672. Olin AR, Reichle J, Johnson L, et al. Examining dynamic visual scene displays: implications for arranging and teaching symbol selection. Am J Speech Lang Pathol. 2010 Nov;19(4):284-97. PMID: 20581110; X-1, X-3, X-4
673. Olin JT, Aarsland D, Meng X. Rivastigmine in the treatment of dementia associated with Parkinson's disease: effects on activities of daily living. Dement Geriatr Cogn Disord. 2010;29(6):510-5. PMID: 20523050; X-5
674. Palmen A, Didden R, Korzilius H. Effectiveness of behavioral skills training on staff performance in a job training setting for high-functioning adolescents with autism spectrum disorders. Research in Autism Spectrum Disorders. 2010;4(4):731-40. X-5
675. Pang Y. Facilitating Family Involvement in Early Intervention to Preschool Transition. School Community Journal. 2010;20(2):183-98. X-5
676. Paribello C, Tao L, Folino A, et al. Open-label add-on treatment trial of minocycline in fragile X syndrome. BMC Neurol. 2010;10:91. PMID: 20937127; X-5
677. Parmanto B, Saptono A, Pramana G, et al. VISYTER: versatile and integrated system for telerehabilitation. Telemed J E Health. 2010 Nov;16(9):939-44. PMID: 21034239; X-5
678. Parris A. Implementing interventions for an individual with complex needs through a co-ordinated approach. Advances in Mental Health and Intellectual Disabilities. 2010;4(2):33-7. X-5
679. Paynter J, Peterson C. Language and ToM development in autism versus Asperger syndrome: Contrasting influences of syntactic versus lexical/semantic maturity. Research in Autism Spectrum Disorders. 2010 7//;4(3):377-85. X-4
680. Pedrosa E, Shah A, Tenore C, et al. beta-catenin promoter ChIP-chip reveals potential schizophrenia and bipolar disorder gene network. J Neurogenet. 2010 Dec;24(4):182-93. PMID: 20615089; X-5
681. Pelletier K, McNamara B, Braga-Kenyon P, et al. Effect of video self-monitoring on procedural integrity. Behavioral Interventions. 2010;25(4):261-74. X-5
682. Philippe P, Scholl JM, Jacques J. Comorbidity in autism spectrum. Psychiatr Danub. 2010 Nov;22 Suppl 1:S158-60. PMID: 21057429; X-5
683. Pichler J, Horn V, Macdonald S, et al. Review of the diagnoses predisposing infants to intestinal failure on hospitalized parenteral nutrition. Transplant Proc. 2010 Jan-Feb;42(1):22-3. PMID: 20172273; X-5
684. Pinborough-Zimmerman J, Bilder D, Satterfield R, et al. The impact of surveillance method and record source on autism prevalence: Collaboration with Utah maternal and child health programs. Maternal and Child Health Journal. 2010;14(3):392-400. X-5
685. Plavnick JB, Ferreri SJ, Maupin AN. The effects of self-monitoring on the procedural integrity of a behavioral intervention for young children with developmental disabilities. Journal of Applied Behavior Analysis. 2010;43(2):315-20. X-3, X-5

686. Ploog BO. Stimulus Overselectivity Four Decades Later: A Review of the Literature and Its Implications for Current Research in Autism Spectrum Disorder. Springer. 233 Spring Street, New York, NY 10013.; 2010. p. 1332-49. X-4
687. Polatajko HJ. The CO-OP Twist. Physical & Occupational Therapy in Pediatrics. 2010;30(4):277-9. X-2, X-3, X-5
688. Poling A. Looking to the Future: Will Behavior Analysis Survive and Prosper? Behavior Analyst. 2010;33(1):7-17. X-5
689. Pongpech S, Aurboonyawat T, Visudibhan A, et al. Endovascular management in children with vein of Galen aneurysmal malformation. Minim Invasive Neurosurg. 2010 Aug;53(4):169-74. PMID: 21132608; X-5
690. Preece D, Jordan R. Obtaining the views of children and young people with autism spectrum disorders about their experience of daily life and social care support. British Journal of Learning Disabilities. 2010;38(1):10-20. X-5
691. Price CS, Thompson WW, Goodson B, et al. Prenatal and infant exposure to thimerosal from vaccines and immunoglobulins and risk of autism. Pediatrics. 2010;126(4):656-64. X-5
692. Prichard EA, Palucka A, Reid M, et al. Review of admissions of individuals with autism spectrum disorders to a specialized Dual Diagnosis Program. Journal on Developmental Disabilities. 2010;16(1):76-84. X-5
693. Procyshyn RM, Honer WG, Wu TK, et al. Persistent antipsychotic polypharmacy and excessive dosing in the community psychiatric treatment setting: a review of medication profiles in 435 Canadian outpatients. J Clin Psychiatry. 2010 May;71(5):566-73. PMID: 20361903; X-5
694. Punt M, M DEJ, E DEG, et al. Minor neurological dysfunction in children with dyslexia. Dev Med Child Neurol. 2010 Dec;52(12):1127-32. PMID: 20518800; X-5
695. Rakap S. Impacts of Learning Styles and Computer Skills on Adult Students' Learning Online. Turkish Online Journal of Educational Technology - TOJET. 2010;9(2):108-15. X-5
696. Randi J, Newman T, Grigorenko EL. Teaching Children with Autism to Read for Meaning: Challenges and Possibilities. Springer. 233 Spring Street, New York, NY 10013.; 2010. p. 890-902. X-1, X-2, X-3, X-4
697. Rao S, Salmon G. Autism spectrum disorders. Br J Hosp Med (Lond). 2010 Dec;71(12):699-703. PMID: 21135768; X-5
698. Read N, Schofield A. Autism: are mental health services failing children and parents? J Fam Health Care. 2010;20(4):120-4. PMID: 21053660; X-5
699. Reed DD, Luiselli JK, Morizio LC, et al. Sequential Modification and the Identification of Instructional Components Occasioning Self-Injurious Behavior. Child & Family Behavior Therapy. 2010;32(1):1-16. X-3
700. Reichle J, Johnson L, Monn E, et al. Task Engagement and Escape Maintained Challenging Behavior: Differential Effects of General and Explicit Cues when Implementing a Signaled Delay in the Delivery of Reinforcement. Journal of Autism and Developmental Disorders. 2010;40(6):709-20. X-3, X-5
701. Reid DH, Parsons MB, Lattimore LP. Designing and evaluating assessment-based interventions to reduce stereotypy among adults with autism in a community job. Behavior Analysis in Practice. 2010;3(2):27-36. X-5
702. Rezaei V, Mohammadi MR, Ghanizadeh A, et al. Double-blind, placebo-controlled trial of risperidone plus topiramate in children with autistic disorder. Prog Neuropsychopharmacol Biol Psychiatry. 2010 Oct 1;34(7):1269-72. PMID: 20637249; X-5
703. Robb AS. Managing Irritability and Aggression in Autism Spectrum Disorders in Children and Adolescents. Developmental Disabilities Research Reviews. 2010;16(3):258-64. X-1, X-2, X-3, X-4
704. Roberts D, Pickering N. Parent training programme for autism spectrum disorders: an evaluation. Community Pract. 2010 Oct;83(10):27-30. PMID: 21049753; X-3
705. Rodger S, Ashburner J, Cartmill L, et al. Helping children with autism spectrum disorders and their families: are we losing our occupation-centred focus? Aust Occup Ther J. 2010 Aug;57(4):276-80. PMID: 20854603; X-1, X-2, X-3, X-4
706. Rodger S, Vishram A. Mastering social and organization goals: strategy use by two children with Asperger syndrome during cognitive orientation to daily occupational performance. Phys Occup Ther Pediatr. 2010 Nov;30(4):264-76. PMID: 20822395; X-3
707. Rosenthal E, Brennan L, Xie S, et al. Association between cognition and function in patients with Parkinson disease with and without dementia. Mov Disord. 2010 Jul 15;25(9):1170-6. PMID: 20310053; X-5
708. Rosset DB, Santos A, Da Fonseca D, et al. Do children perceive features of real and cartoon faces in the same way? Evidence from typical development and autism. Journal of Clinical and Experimental Neuropsychology. 2010;32(2):212-8. X-1, X-4
709. Roth MP, Williams KE, Paul CM. Treating food and liquid refusal in an adolescent with Asperger's disorder. Clinical Case Studies. 2010;9(4):260-72. X-5

710. Rotheram-Fuller E, Kasari C, Chamberlain B, et al. Social Involvement of Children with Autism Spectrum Disorders in Elementary School Classrooms. Journal of Child Psychology and Psychiatry. 2010;51(11):1227-34. X-5
711. Rowles BM, Findling RL. Review of Pharmacotherapy Options for the Treatment of Attention-Deficit/Hyperactivity Disorder (ADHD) and ADHD-Like Symptoms in Children and Adolescents with Developmental Disorders. Developmental Disabilities Research Reviews. 2010;16(3):273-82. X-2, X-5
712. Ruble LA, Dalrymple NJ, McGrew JH. The Effects of Consultation on Individualized Education Program Outcomes for Young Children with Autism: The Collaborative Model for Promoting Competence and Success. Journal of Early Intervention. 2010;32(4):286-301. X-4
713. Russell G, Ford T, Steer C, et al. Identification of Children with the Same Level of Impairment as Children on the Autistic Spectrum, and Analysis of Their Service Use. Journal of Child Psychology and Psychiatry. 2010;51(6):643-51. X-5
714. Russo N, Foxe JJ, Brandwein AB, et al. Multisensory processing in children with autism: high-density electrical mapping of auditory-somatosensory integration. Autism Res. 2010 Oct;3(5):253-67. PMID: 20730775; X-5
715. Russo NM, Hornickel J, Nicol T, et al. Biological changes in auditory function following training in children with autism spectrum disorders. Behav Brain Funct. 2010;6:60. PMID: 20950487; X-3, X-5
716. Rutter M, Sonuga-Barke EJ, Castle J. Investigating the Impact of Early Institutional Deprivation on Development: Background and Research Strategy of the English and Romanian Adoptees (ERA) Study. Monographs of the Society for Research in Child Development. 2010;75(1):1-20. X-2, X-5
717. Salamanca AA. Psychotherapy treatment program in a group of adults with high-functioning autism spectrum disorder. Actas Esp Psiquiatr. 2010 Mar-Apr;38(2):94-100. PMID: 20976638; X-5
718. Sawyer MG, Bittman M, La Greca AM, et al. Time demands of caring for children with autism: what are the implications for maternal mental health? J Autism Dev Disord. 2010 May;40(5):620-8. PMID: 19949845; X-5
719. Scheeren AM, Begeer S, Banerjee R, et al. Can you tell me something about yourself?: Self-presentation in children and adolescents with high functioning autism spectrum disorder in hypothetical and real life situations. Autism. 2010 Sep;14(5):457-73. PMID: 20841344; X-3, X-4
720. Schmitt FA, Aarsland D, Bronnick KS, et al. Evaluating rivastigmine in mild-to-moderate Parkinson's disease dementia using ADAS-cog items. Am J Alzheimers Dis Other Demen. 2010 Aug;25(5):407-13. PMID: 20392860; X-5
721. Schmitt FA, Farlow MR, Meng X, et al. Efficacy of rivastigmine on executive function in patients with Parkinson's disease dementia. CNS Neurosci Ther. 2010 Dec;16(6):330-6. PMID: 20950329; X-5
722. Schneider N, Goldstein H. Using Social Stories and Visual Schedules to Improve Socially Appropriate Behaviors in Children with Autism. Journal of Positive Behavior Interventions. 2010;12(3):149-60. X-3
723. Schultz ST. Can autism be triggered by acetaminophen activation of the endocannabinoid system? Acta Neurobiol Exp (Wars). 2010;70(2):227-31. PMID: 20628445; X-5
724. Schwichtenberg AJ, Young GS, Sigman M, et al. Can family affectedness inform infant sibling outcomes of autism spectrum disorders? Journal of Child Psychology and Psychiatry. 2010;51(9):1021-30. X-5
725. Self TL, Coufal K, Parham DF. Allied healthcare providers' role in screening for autism spectrum disorder. Journal of Allied Health. 2010;39(3, Pt1):165-74. X-5
726. Self TL, Hale LS, Crumrine D. Pharmacotherapy and children with autism spectrum disorder: a tutorial for speech-language pathologists. Lang Speech Hear Serv Sch. 2010 Jul;41(3):367-75. PMID: 20543026; X-5
727. Senju A, Southgate V, Miura Y, et al. Absence of spontaneous action anticipation by false belief attribution in children with autism spectrum disorder. Development and Psychopathology. 2010;22(2):353-60. X-4
728. Sheng L, Ding X, Ferguson M, et al. Prenatal polycyclic aromatic hydrocarbon exposure leads to behavioral deficits and downregulation of receptor tyrosine kinase, MET. Toxicol Sci. 2010 Dec;118(2):625-34. PMID: 20889680; X-5
729. Shireman TI, Reichard A, Nazir N, et al. Quality of diabetes care for adults with developmental disabilities. Disabil Health J. 2010 Jul;3(3):179-85. PMID: 21122783; X-5
730. Shute N. Desperate for an autism cure. Sci Am. 2010 Oct;303(4):80-5. PMID: 20923134; X-5
731. Shyu YI, Tsai JL, Tsai WC. Explaining and selecting treatments for autism: parental explanatory models in Taiwan. J Autism Dev Disord. 2010 Nov;40(11):1323-31. PMID: 20224997; X-5
732. Sidener TM, Carr JE, Karsten AM, et al. Evaluation of Single and Mixed Verbal Operant Arrangements for Teaching Mands and Tacts. Analysis of Verbal Behavior. 2010;26:15-30. X-3
733. Simpson CG, Gaus MD, Biggs MJG, et al. Physical Education and Implications for Students with Asperger's Syndrome. TEACHING Exceptional Children. 2010;42(6):48-56. X-5

734. Smith IM, Koegel RL, Koegel LK, et al. Effectiveness of a novel community-based early intervention model for children with autistic spectrum disorder. Am J Intellect Dev Disabil. 2010 Nov;115(6):504-23. PMID: 20946003; X-5
735. Smith JJ. How to Fix an Az-Burger. Reclaiming Children and Youth. 2010;19(1):7-11. X-5
736. Somani BK, Moseley H, Eljamel MS, et al. Photodynamic diagnosis (PDD) for upper urinary tract transitional cell carcinoma (UT-TCC): evolution of a new technique. Photodiagnosis Photodyn Ther. 2010 Mar;7(1):39-43. PMID: 20230992; X-5
737. South M, Larson MJ, Krauskopf E, et al. Error processing in high-functioning autism spectrum disorders. Biological Psychology. 2010;85(2):242-51. X-5
738. Sperry L, Neitzel J, Engelhardt-Wells K. Peer-Mediated Instruction and Intervention Strategies for Students with Autism Spectrum Disorders. Preventing School Failure. 2010;54(4):256-64. X-1, X-2, X-3, X-4
739. St Pourcain B, Wang K, Glessner JT, et al. Association between a high-risk autism locus on 5p14 and social communication spectrum phenotypes in the general population. Am J Psychiatry. 2010 Nov;167(11):1364-72. PMID: 20634369; X-5
740. Stahmer AC, Suhrheinrich J, Reed S, et al. Pivotal Response Teaching in the Classroom Setting. Preventing School Failure. 2010;54(4):265-74. X-1, X-2, X-3, X-4
741. Stanislaus P, Zaak D, Stadler T, et al. Photodynamic diagnosis in patients with T1G3 bladder cancer: influence on recurrence rate. World J Urol. 2010 Aug;28(4):407-11. PMID: 20582546; X-5
742. Steward R. On the record: Robyn Steward. Interview by Alita Howe. Ment Health Today. 2010 Dec-2011 Jan:38. PMID: 21235057; X-5
743. Stichter JP, Herzog MJ, Visovsky K, et al. Social competence intervention for youth with Asperger Syndrome and high-functioning autism: an initial investigation. J Autism Dev Disord. 2010 Sep;40(9):1067-79. PMID: 20162344; X-1, X-3
744. Strata F, Stoianov IP, de Villers-Sidani E, et al. Perinatal asphyxia affects rat auditory processing: implications for auditory perceptual impairments in neurodevelopmental disorders. PLoS One. 2010;5(12):e15326. PMID: 21203459; X-5
745. Su H, Dickstein-Fischer L, Harrington K, et al. Cable-driven elastic parallel humanoid head with face tracking for Autism Spectrum Disorder interventions. Conf Proc IEEE Eng Med Biol Soc. 2010;2010:467-70. PMID: 21095653; X-5
746. Sun F, Anderson R, Aguilar G. Stratum corneum permeation and percutaneous drug delivery of hydrophilic molecules enhanced by cryopneumatic and photopneumatic technologies. J Drugs Dermatol. 2010 Dec;9(12):1528-30. PMID: 21120262; X-5
747. Sy JR, Borrero JC, Borrero CS. Characterizing Response-Reinforcer Relations in the Natural Environment: Exploratory Matching Analyses. Psychological Record. 2010;60(4):609-26. X-3, X-5
748. Tanaka JW, Wolf JM, Klaiman C, et al. Using computerized games to teach face recognition skills to children with autism spectrum disorder: the Let's Face It! program. J Child Psychol Psychiatry. 2010 Aug;51(8):944-52. PMID: 20646129; X-1, X-3, X-4
749. Tarbox J, Schiff A, Najdowski AC. Parent-implemented procedural modification of escape extinction in the treatment of food selectivity in a young child with autism. Education & Treatment of Children. 2010;33(2):223-34. X-3
750. Tarbox J, Wilke AE, Findel-Pyles RS, et al. A comparison of electronic to traditional pen-and-paper data collection in discrete trial training for children with autism. Research in Autism Spectrum Disorders. 2010;4(1):65-75. X-3, X-4
751. Taylor N, Isaac C, Milne E. A comparison of the development of audiovisual integration in children with autism spectrum disorders and typically developing children. J Autism Dev Disord. 2010 Nov;40(11):1403-11. PMID: 20354776; X-5
752. Thomas BR, Lafasakis M, Sturmey P. The effects of prompting, fading, and differential reinforcement on vocal mands in non-verbal preschool children with autism spectrum disorders. Behavioral Interventions. 2010;25(2):157-68. X-3, X-4
753. Tiger JH, Toussaint KA, Roath CT. An Evaluation of the Value of Choice-Making Opportunities in Single-Operant Arrangements: Simple Fixed- and Progressive-Ratio Schedules. Journal of Applied Behavior Analysis. 2010;43(3):519-24. X-3, X-5
754. Twarek M, Cihon T, Eshleman J. The effects of fluent levels of big 6 + 6 skill elements on functional motor skills with children with autism. Behavioral Interventions. 2010;25(4):275-93. X-3
755. Uekusa M, Omura K, Nakajima Y, et al. Uptake and kinetics of 5-aminolevulinic acid in oral squamous cell carcinoma. Int J Oral Maxillofac Surg. 2010 Aug;39(8):802-5. PMID: 20409686; X-5

756. Ulke-Kurkcuoglu B, Kircaali-Iftar G. A comparison of the effects of providing activity and material choice to children with autism spectrum disorders. J Appl Behav Anal. 2010 Winter;43(4):717-21. PMID: 21541155; X-3, X-5
757. Valdovinos MG, Bailey L, Taylor SL. Examining risperidone use in those diagnosed with autism 1 year after FDA approval. Journal of Clinical Psychiatry. 2010;71(5):651-2. X-1, X-3, X-4
758. Valenti M, Cerbo R, Masedu F, et al. Intensive intervention for children and adolescents with autism in a community setting in Italy: A single-group longitudinal study. Child and Adolescent Psychiatry and Mental Health. 2010;4. X-5
759. Van Santen JP, Prud'hommeaux ET, Black LM, et al. Computational prosodic markers for autism. Autism. 2010 May;14(3):215-36. PMID: 20591942; X-4
760. Viau R, Arsenault-Lapierre G, Fecteau S, et al. Effect of service dogs on salivary cortisol secretion in autistic children. Psychoneuroendocrinology. 2010 Sep;35(8):1187-93. PMID: 20189722; X-4
761. Virues-Ortega J. Applied behavior analytic intervention for autism in early childhood: meta-analysis, meta-regression and dose-response meta-analysis of multiple outcomes. Clin Psychol Rev. 2010 Jun;30(4):387-99. PMID: 20223569; X-5
762. Vladescu JC, Kodak T. A Review of Recent Studies on Differential Reinforcement during Skill Acquisition in Early Intervention. Journal of Applied Behavior Analysis. 2010;43(2):351-5. X-5
763. Volden J, Phillips L. Measuring pragmatic language in speakers with autism spectrum disorders: Comparing the children's communication checklist--2 and the test of pragmatic language. Am J Speech Lang Pathol. 2010 Aug;19(3):204-12. PMID: 20220047; X-5
764. Von Benzon N. Moving on from Ramps? The Utility of the Social Model of Disability for Facilitating Experiences of Nature for Disabled Children. Disability & Society. 2010;25(5):617-26. X-5
765. Wachtel LE, Griffin MM, Dhossche DM, et al. Brief Report: Electroconvulsive Therapy for Malignant Catatonia in an Autistic Adolescent. Autism: The International Journal of Research and Practice. 2010;14(4):349-58. X-5
766. Walberg JL, Craig-Unkefer LA. An Examination of the Effects of a Social Communication Intervention on the Play Behaviors of Children with Autism Spectrum Disorder. Education and Training in Autism and Developmental Disabilities. 2010;45(1):69-80. X-3
767. Wallace GL, Dankner N, Kenworthy L, et al. Age-related temporal and parietal cortical thinning in autism spectrum disorders. Brain. 2010 Dec;133(Pt 12):3745-54. PMID: 20926367; X-5
768. Wallace KS, Rogers SJ. Intervening in Infancy: Implications for Autism Spectrum Disorders. 2010;51:1300-20. X-1, X-3, X-4
769. Wallace S, Parsons S, Westbury A, et al. Sense of presence and atypical social judgments in immersive virtual environments. Responses of adolescents with Autism Spectrum Disorders. Autism. 2010 May;14(3):199-213. PMID: 20484000; X-5
770. Wang KK, Zhu TC. Modeling scatter-to-primary dose ratio for megavoltage photon beams. Med Phys. 2010 Oct;37(10):5270-8. PMID: 21089761; X-5
771. Watson LR, Baranek GT, Roberts JE, et al. Behavioral and physiological responses to child-directed speech as predictors of communication outcomes in children with autism spectrum disorders. J Speech Lang Hear Res. 2010 Aug;53(4):1052-64. PMID: 20631229; X-4
772. Wehmeyer ML, Shogren KA, Zager D, et al. Research-Based Principles and Practices for Educating Students with Autism: Self-Determination and Social Interactions. Education and Training in Autism and Developmental Disabilities. 2010;45(4):475-86. X-5
773. Weil TN, Inglehart MR. Dental education and dentists' attitudes and behavior concerning patients with autism. J Dent Educ. 2010 Dec;74(12):1294-307. PMID: 21123497; X-5
774. Weiss JA, Lunsky Y. Group cognitive behaviour therapy for adults with Asperger syndrome and anxiety or mood disorder: A case series. Clinical Psychology & Psychotherapy. 2010;17(5):438-46. X-5
775. Weiss MJ, Pearson N, Foley K, et al. The Importance of Fluency Outcomes in Learners with Autism. Behavior Analyst Today. 2010;11(4):245-52. X-1, X-2, X-3, X-4
776. Weissman AS, Bates ME. Increased Clinical and Neurocognitive Impairment in Children with Autism Spectrum Disorders and Comorbid Bipolar Disorder. Research in Autism Spectrum Disorders. 2010;4(4):670-80. X-5
777. Wheeler CA, Hatton D, Holloway TV, et al. Maternal Responses to Child Frustration and Requests for Help in Dyads with Fragile X Syndrome. Journal of Intellectual Disability Research. 2010;54(6):501-15. X-5
778. White SE, Weiss JA. Services for adults and adolescents with ASD in Ontario—Parent and professional perspectives. Journal on Developmental Disabilities. 2010;16(1):34-9. X-5

779. White SW, Koenig K, Scahill L. Group Social Skills Instruction for Adolescents with High-Functioning Autism Spectrum Disorders. Focus on Autism and Other Developmental Disabilities. 2010;25(4):209-19. X-1
780. Wichnick AM, Vener SM, Keating C, et al. The effect of a script-fading procedure on unscripted social initiations and novel utterances among young children with autism. Research in Autism Spectrum Disorders. 2010;4(1):51-64. X-3
781. Wichnick AM, Vener SM, Pyrtek M, et al. The effect of a script-fading procedure on responses to peer initiations among young children with autism. Research in Autism Spectrum Disorders. 2010;4(2):290-9. X-3
782. Wilder DA, Allison J, Nicholson K, et al. Further evaluation of antecedent interventions on compliance: the effects of rationales to increase compliance among preschoolers. J Appl Behav Anal. 2010 Winter;43(4):601-13. PMID: 21541147; X-3
783. Wilkinson LA. School-Age Children with Autism Spectrum Disorders: Screening and Identification. European Journal of Special Needs Education. 2010 August 2010;25(3):211-23. X-5
784. Wilkinson LA. Facilitating the Identification of Autism Spectrum Disorders in School-Age Children. Remedial and Special Education. 2010 2010;31(5):350-7. X-5
785. Wise MD, Little AA, Holliman JB, et al. Can state early intervention programs meet the increased demand of children suspected of having autism spectrum disorders? J Dev Behav Pediatr. 2010 Jul-Aug;31(6):469-76. PMID: 20585267; X-5
786. Wong VC, Chen WX. Randomized controlled trial of electro-acupuncture for autism spectrum disorder. Altern Med Rev. 2010 Jul;15(2):136-46. PMID: 20806998; X-1
787. Wong VC, Sun JG. Randomized controlled trial of acupuncture versus sham acupuncture in autism spectrum disorder. J Altern Complement Med. 2010 May;16(5):545-53. PMID: 20804366; X-5
788. Woodbury-Smith M, Clare I, Holland AJ, et al. Circumscribed interests and 'offenders' with autism spectrum disorders: A case-control study. Journal of Forensic Psychiatry & Psychology. 2010;21(3):366-77. X-5
789. Wu Y-P, Mirenda P, Wang H-P, et al. Assessment and Treatment of Stereotypic Vocalizations in a Taiwanese Adolescent with Autism: A Case Study. International Journal of Special Education. 2010;25(3):160-7. X-5
790. Xu X, Yang H, Lin YF, et al. Neuronal Abelson helper integration site-1 (Ahi1) deficiency in mice alters TrkB signaling with a depressive phenotype. Proc Natl Acad Sci U S A. 2010 Nov 2;107(44):19126-31. PMID: 20956301; X-5
791. Yang P, Lung F-W, Jong Y-J, et al. Stability and change of cognitive attributes in children with uneven/delayed cognitive development from preschool through childhood. Research in Developmental Disabilities. 2010;31(4):895-902. X-5
792. Yanos PT, Lysaker PH, Roe D. Internalized stigma as a barrier to improvement in vocational functioning among people with schizophrenia-spectrum disorders. Psychiatry Research. 2010;178(1):211-3. X-5
793. Yilmaz I, Konukman F, Birkan B, et al. Effects of Constant Time Delay Procedure on the Halliwick's Method of Swimming Rotation Skills for Children with Autism. Education and Training in Autism and Developmental Disabilities. 2010;45(1):124-35. X-3, X-5
794. Yokotani K. Educational level signals unobserved abilities of people with high functioning autism spectrum disorders. Psychol Rep. 2010 Aug;107(1):227-35. PMID: 20923067; X-5
795. Zaidman-Zait A, Mirenda P, Zumbo BD, et al. An item response theory analysis of the Parenting Stress Index-Short Form with parents of children with autism spectrum disorders. J Child Psychol Psychiatry. 2010 Nov;51(11):1269-77. PMID: 20546082; X-5
796. . Autism spectrum disorders revisited. Several recent studies raise new questions about cause and prevention. Harv Ment Health Lett. 2011 Oct;28(4):1-3. PMID: 22125823; X-5
797. . No "magic pill" for autism spectrum disorders. Although medication prescriptions are common, there is little evidence they do any good. Harv Ment Health Lett. 2011 Aug;28(2):4. PMID: 21980632; X-5
798. . Fear and its consequences. Sci Am. 2011 Feb;304(2):14. PMID: 21319529; X-5
799. Adamek L, Nichols S, Tetenbaum SP, et al. Individual Temperament and Problem Behavior in Children with Autism Spectrum Disorders. Focus on Autism and Other Developmental Disabilities. 2011;26(3):173-83. X-5
800. Adams JB, Audhya T, McDonough-Means S, et al. Effect of a vitamin/mineral supplement on children and adults with autism. BMC Pediatr. 2011;11:111. PMID: 22151477; X-1
801. Adams JB, Johansen LJ, Powell LD, et al. Gastrointestinal flora and gastrointestinal status in children with autism--comparisons to typical children and correlation with autism severity. BMC Gastroenterol. 2011;11:22. PMID: 21410934; X-5
802. Ahrens EN, Lerman DC, Kodak T, et al. Further evaluation of response interruption and redirection as treatment for stereotypy. J Appl Behav Anal. 2011 Spring;44(1):95-108. PMID: 21541130; X-3

803. Akmanoglu N, Tekin-Iftar E. Teaching children with autism how to respond to the lures of strangers. Autism. 2011 Mar;15(2):205-22. PMID: 21339247; X-3
804. Al Abdulmohsen T, Kruger TH. The contribution of muscular and auditory pathologies to the symptomatology of autism. Med Hypotheses. 2011 Dec;77(6):1038-47. PMID: 21925796; X-5
805. Al-Farsi YM, Al-Sharbati MM, Waly MI, et al. Malnutrition among Preschool-Aged Autistic Children in Oman. Research in Autism Spectrum Disorders. 2011;5(4):1549-52. X-5
806. Aljunied M, Frederickson N. Cognitive Indicators of Different Levels of Special Educational Support Needs in Autism. Research in Autism Spectrum Disorders. 2011;5(1):368-76. X-5
807. Alkonyi B, Chugani HT, Karia S, et al. Clinical outcomes in bilateral Sturge-Weber syndrome. Pediatr Neurol. 2011 Jun;44(6):443-9. PMID: 21555056; X-5
808. Allen K. Managing Prader-Willi syndrome in families: an embodied exploration. Soc Sci Med. 2011 Feb;72(4):460-8. PMID: 21216515; X-5
809. Al-Yafee YA, Al-Ayadhi LY, Haq SH, et al. Novel metabolic biomarkers related to sulfur-dependent detoxification pathways in autistic patients of Saudi Arabia. BMC Neurology. 2011; X-5
810. Amirabdollahian F, Robins B, Dautenhahn K, et al. Investigating tactile event recognition in child-robot interaction for use in autism therapy. Conf Proc IEEE Eng Med Biol Soc. 2011;2011:5347-51. PMID: 22255546; X-3, X-4
811. Anastasiou D, Kauffman JM. A Social Constructionist Approach to Disability: Implications for Special Education. Exceptional Children. 2011;77(3):367-84. X-5
812. Anderberg D, Chevalier A, Wadsworth J. Anatomy of a health scare: education, income and the MMR controversy in the UK. J Health Econ. 2011 May;30(3):515-30. PMID: 21439663; X-5
813. Anderson J, Le DD. Abatement of intractable vocal stereotypy using an overcorrection procedure. Behavioral Interventions. 2011;26(2):134-46. X-3
814. Angell ME, Nicholson JK, Watts EH, et al. Using a Multicomponent Adapted Power Card Strategy to Decrease Latency during Interactivity Transitions for Three Children with Developmental Disabilities. Focus on Autism and Other Developmental Disabilities. 2011;26(4):206-17. X-3
815. Antshel KM, Polacek C, McMahon M, et al. Comorbid ADHD and anxiety affect social skills group intervention treatment efficacy in children with autism spectrum disorders. J Dev Behav Pediatr. 2011 Jul-Aug;32(6):439-46. PMID: 21654508; X-5
816. Arron K, Oliver C, Moss J, et al. The Prevalence and Phenomenology of Self-Injurious and Aggressive Behaviour in Genetic Syndromes. Journal of Intellectual Disability Research. 2011;55(2):109-20. X-5
817. Assouline SG, Whiteman CS. Twice-Exceptionality: Implications for School Psychologists in the Post-IDEA 2004 Era. Journal of Applied School Psychology. 2011;27(4):380-402. X-5
818. Aubry JF, Bouchard H, Bessieres I, et al. Validation of an electron Monte Carlo dose calculation algorithm in the presence of heterogeneities using EGSnrc and radiochromic film measurements. J Appl Clin Med Phys. 2011;12(4):3392. PMID: 22088999; X-5
819. Avidan MS, Smith JR, Skrupky LP, et al. The occurrence of antibodies to heparin-platelet factor 4 in cardiac and thoracic surgical patients receiving desirudin or heparin for postoperative venous thrombosis prophylaxis. Thromb Res. 2011 Dec;128(6):524-9. PMID: 21794899; X-5
820. Ayres KM, Douglas KH, Lowrey AK, et al. I Can Identify Saturn but I Can't Brush My Teeth: What Happens when the Curricular Focus for Students with Severe Disabilities Shifts. Education and Training in Autism and Developmental Disabilities. 2011;46(1):11-21. X-5
821. Baandrup L, Fagerlund B, Jennum P, et al. Prolonged-release melatonin versus placebo for benzodiazepine discontinuation in patients with schizophrenia: a randomized clinical trial - the SMART trial protocol. BMC Psychiatry. 2011;11:160. PMID: 21975110; X-5
822. Bagshaw M. Anaesthesia and the autistic child. J Perioper Pract. 2011 Sep;21(9):313-7. PMID: 22474776; X-5
823. Bailey RL, Angell ME, Stoner JB. Improving Literacy Skills in Students with Complex Communication Needs Who Use Augmentative/Alternative Communication Systems. Education and Training in Autism and Developmental Disabilities. 2011;46(3):352-68. X-1, X-3, X-4
824. Bakare MO, Igwe MN, Odinka PC, et al. Neuropsychiatric diagnosis and psychotropic medication prescription patterns in a mental hospital-based child and adolescent psychiatric service in Nigeria. J Health Care Poor Underserved. 2011 Aug;22(3):751-5. PMID: 21841276; X-5
825. Baltruschat L, Hasselhorn M, Tarbox J, et al. Addressing Working Memory in Children with Autism through Behavioral Intervention. Research in Autism Spectrum Disorders. 2011;5(1):267-76. X-3
826. Baltruschat L, Hasselhorn M, Tarbox J, et al. Further Analysis of the Effects of Positive Reinforcement on Working Memory in Children with Autism. Research in Autism Spectrum Disorders. 2011 2011;5(2):855-63. X-3

827. Bancroft SL, Weiss JS, Libby ME, et al. A comparison of procedural variations in teaching behavior chains: manual guidance, trainer completion, and no completion of untrained steps. J Appl Behav Anal. 2011 Fall;44(3):559-69. PMID: 21941385; X-3
828. Barbaro J, Ridgway L, Dissanayake C. Developmental surveillance of infants and toddlers by maternal and child health nurses in an Australian community-based setting: promoting the early identification of autism spectrum disorders. J Pediatr Nurs. 2011 Aug;26(4):334-47. PMID: 21726784; X-5
829. Barnhill GP, Polloway EA, Sumutka BM. A Survey of Personnel Preparation Practices in Autism Spectrum Disorders. Focus on Autism and Other Developmental Disabilities. 2011;26(2):75-86. X-5
830. Bartlett SM, Rapp JT, Krueger TK, et al. The use of response cost to treat spitting by a child with autism. Behavioral Interventions. 2011;26(1):76-83. X-3
831. Beherec L, Lambrey S, Quilici G, et al. Retrospective review of clozapine in the treatment of patients with autism spectrum disorder and severe disruptive behaviors. J Clin Psychopharmacol. 2011 Jun;31(3):341-4. PMID: 21508854; X-1, X-3
832. Belleudi V, Fusco D, Kirchmayer U, et al. Definition of patients treated with evidence based drugs in absence of prescribed daily doses: the example of acute myocardial infarction. Pharmacoepidemiol Drug Saf. 2011 Feb;20(2):169-76. PMID: 21254288; X-5
833. Ben Said M, Robel L, Vion E, et al. Implementation and experimentation of TEDIS: an information system dedicated to patients with pervasive developmental disorders. Stud Health Technol Inform. 2011;169:270-4. PMID: 21893755; X-4, X-5
834. Bendixen RM, Elder JH, Donaldson S, et al. Effects of a father-based in-home intervention on perceived stress and family dynamics in parents of children with autism. Am J Occup Ther. 2011 Nov-Dec;65(6):679-87. PMID: 22214112; X-5
835. Bennett K, Reichow B, Wolery M. Effects of Structured Teaching on the Behavior of Young Children with Disabilities. Focus on Autism and Other Developmental Disabilities. 2011;26(3):143-52. X-3, X-5
836. Bent S, Bertoglio K, Ashwood P, et al. A pilot randomized controlled trial of omega-3 fatty acids for autism spectrum disorder. J Autism Dev Disord. 2011 May;41(5):545-54. PMID: 20683766; X-5
837. Berger BE, Navar-Boggan AM, Omer SB. Congenital rubella syndrome and autism spectrum disorder prevented by rubella vaccination--United States, 2001-2010. BMC Public Health. 2011;11:340. PMID: 21592401; X-5
838. Bergstrom R, Tarbox J, Gutshall KA. Behavioral intervention for domestic pet mistreatment in a young child with autism. Research in Autism Spectrum Disorders. 2011;5(1):218-21. X-3
839. Bernardi L, Tuzzi A. Analyzing written communication in AAC contexts: a statistical perspective. Augment Altern Commun. 2011 Sep;27(3):183-94. PMID: 22008031; X-3, X-5
840. Bernhardt EB, Walsh KH, Posey DJ, et al. Memantine for comorbid obsessive-compulsive disorder and Asperger disorder suggests a link in glutamatergic dysregulation. Journal of Clinical Psychopharmacology. 2011;31(5):673-5. X-5
841. Betz AM, Higbee TS, Kelley KN, et al. Increasing Response Variability of Mand Frames with Script Training and Extinction. Journal of Applied Behavior Analysis. 2011;44(2):357-62. X-3
842. Beversdorf DQ, Saklayen S, Higgins KF, et al. Effect of propranolol on word fluency in autism. Cogn Behav Neurol. 2011 Mar;24(1):11-7. PMID: 21487259; X-5
843. Bhandari A, Sandlow JI, Brannigan RE. Risks to offspring associated with advanced paternal age. J Androl. 2011 Mar-Apr;32(2):121-2. PMID: 20467047; X-5
844. Bhat AN, Landa RJ, Galloway JC. Current perspectives on motor functioning in infants, children, and adults with autism spectrum disorders. Phys Ther. 2011 Jul;91(7):1116-29. PMID: 21546566; X-5
845. Birkan B, Krantz PJ, McClannahan LE. Teaching children with autism spectrum disorders to cooperate with injections. Research in Autism Spectrum Disorders. 2011;5(2):941-8. X-3
846. Bishop DV, Jacobs PA, Lachlan K, et al. Autism, language and communication in children with sex chromosome trisomies. Arch Dis Child. 2011 Oct;96(10):954-9. PMID: 20656736; X-5
847. Blair K-SC, Lee I-S, Cho S-J, et al. Positive behavior support through family–school collaboration for young children with autism. Topics in Early Childhood Special Education. 2011;31(1):22-36. X-3
848. Bloom SE, Iwata BA, Fritz JN, et al. Classroom Application of a Trial-Based Functional Analysis. Journal of Applied Behavior Analysis. 2011;44(1):19-31. X-5
849. Boccanfuso L, O'Kane JM. CHARLIE : An adaptive robot design with hand and face tracking for use in autism therapy. International Journal of Social Robotics. 2011;3(4):337-47. X-3, X-5
850. Bolton PF, Carcani-Rathwell I, Hutton J, et al. Epilepsy in autism: features and correlates. Br J Psychiatry. 2011 Apr;198(4):289-94. PMID: 21972278; X-5

851. Bowker A, D'Angelo NM, Hicks R, et al. Treatments for autism: parental choices and perceptions of change. J Autism Dev Disord. 2011 Oct;41(10):1373-82. PMID: 21161676; X-4, X-5
852. Boyd BA, McDonough SG, Rupp B, et al. Effects of a family-implemented treatment on the repetitive behaviors of children with autism. J Autism Dev Disord. 2011 Oct;41(10):1330-41. PMID: 21161576; X-3
853. Bragesjo F, Hallberg M. Dilemmas of a vitalizing vaccine market: lessons from the MMR vaccine/autism debate. Sci Context. 2011 Mar;24(1):107-25. PMID: 21560548; X-5
854. Brookman-Frazee L, LaRosa A, Nyp SS, et al. Journal article reviews. Journal of Developmental and Behavioral Pediatrics. 2011;32(3):268. X-5
855. Brosnan J, Healy O. A Review of Behavioral Interventions for the Treatment of Aggression in Individuals with Developmental Disabilities. 2011;32:437-46. X-5
856. Brown T. Right treatment, right patient? Am J Nurs. 2011 Jun;111(6):72. PMID: 21613926; X-5
857. Bruder MB. A Well Walked Path to Program Efficacy: The Details Tell the Story. Topics in Early Childhood Special Education. 2011;31(3):158-61. X-1, X-2, X-3, X-4, X-5
858. Bruns DA, Thompson S. Time to Eat: Improving Mealtimes of Young Children with Autism. Young Exceptional Children. 2011;14(4):3-18. X-2, X-5
859. Buckley AW, Sassower K, Rodriguez AJ, et al. An open label trial of donepezil for enhancement of rapid eye movement sleep in young children with autism spectrum disorders. J Child Adolesc Psychopharmacol. 2011 Aug;21(4):353-7. PMID: 21851192; X-3
860. Budd KS, Hella B, Bae H, et al. Delivering Parent-Child Interaction Therapy in an Urban Community Clinic. Cognitive and Behavioral Practice. 2011;18(4):502-14. X-3
861. Buggey T, Hoomes G. Using Video Self-Modeling with Preschoolers with Autism Spectrum Disorder: Seeing Can Be Believing. Young Exceptional Children. 2011;14(3):2-12. X-1, X-2, X-3, X-4
862. Buggey T, Hoomes G, Sherberger ME, et al. Facilitating Social Initiations of Preschoolers with Autism Spectrum Disorders Using Video Self-Modeling. Focus on Autism and Other Developmental Disabilities. 2011;26(1):25-36. X-3
863. Burket JA, Herndon AL, Winebarger EE, et al. Complex effects of mGluR5 antagonism on sociability and stereotypic behaviors in mice: possible implications for the pharmacotherapy of autism spectrum disorders. Brain Res Bull. 2011 Oct 10;86(3-4):152-8. PMID: 21840381; X-5
864. Busse TR, Downey J. Selective Mutism: A Three-Tiered Approach to Prevention and Intervention. Contemporary School Psychology. 2011;15:53-63. X-5
865. Calarge CA, Miller del D. Predictors of risperidone and 9-hydroxyrisperidone serum concentration in children and adolescents. J Child Adolesc Psychopharmacol. 2011 Apr;21(2):163-9. PMID: 21486167; X-4
866. Call NA, Pabico RS, Findley AJ, et al. Differential reinforcement with and without blocking as treatment for elopement. J Appl Behav Anal. 2011 Winter;44(4):903-7. PMID: 22219538; X-3, X-4
867. Campbell A, Tincani M. The Power Card Strategy: Strength-Based Intervention to Increase Direction Following of Children with Autism Spectrum Disorder. Journal of Positive Behavior Interventions. 2011;13(4):240-9. X-3
868. Cappadocia CM, Weiss JA. Review of Social Skills Training Groups for Youth with Asperger Syndrome and High Functioning Autism. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2011. p. 70-8. X-1, X-2, X-3, X-4
869. Cardon TA, Wilcox MJ. Promoting imitation in young children with autism: a comparison of reciprocal imitation training and video modeling. J Autism Dev Disord. 2011 May;41(5):654-66. PMID: 20697791; X-3
870. Cardon TA, Wilcox MJ, Campbell PH. Caregiver perspectives about assistive technology use with their young children with autism spectrum disorders. Infants & Young Children. 2011;24(2):153-73. X-4
871. Carlson E, Jenkins F, Bitterman A, et al. A Longitudinal View of the Receptive Vocabulary and Math Achievement of Young Children with Disabilities. NCSER 2011-3006. National Center for Special Education Research. 400 Maryland Avenue SW, Washington, DC 20202.; 2011. p. 1-105. X-4
872. Carroll RA, Rapp JT, Rieck TM, et al. The effects of noncontingent reinforcement with alternative oral stimulation in the treatment of rumination. Journal on Developmental Disabilities. 2011;17(1):72-6. X-3
873. Carter M, Roberts J, Williams K, et al. Interventions Used with an Australian Sample of Preschool Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2011;5(3):1033-41. X-5
874. Cassella MD, Sidener TM, Sidener DW, et al. Response interruption and redirection for vocal stereotypy in children with autism: a systematic replication. J Appl Behav Anal. 2011 Spring;44(1):169-73. PMID: 21541114; X-3
875. Cezar GG. Profile of Gabriela G. Cezar. Interview by Kristie Nybo. Biotechniques. 2011 May;50(5):281. PMID: 21548887; X-5

876. Chan JM, O'Reilly MF, Lang RB, et al. Evaluation of a Social Stories[TM] Intervention Implemented by Pre-Service Teachers for Students with Autism in General Education Settings. Research in Autism Spectrum Disorders. 2011;5(2):715-21. X-3
877. Charles J, Harrison C, Britt H. Autism spectrum disorders. Aust Fam Physician. 2011 Sep;40(9):665. PMID: 21894271; X-4, X-5
878. Charles J, Harrison CM, Britt H. Management of children's psychological problems in general practice 1970-1971, 1990-1991 and 2008-2009. Aust N Z J Psychiatry. 2011 Nov;45(11):976-84. PMID: 22017686; X-5
879. Charlot L, Abend S, Ravin P, et al. Non-psychiatric health problems among psychiatric inpatients with intellectual disabilities. J Intellect Disabil Res. 2011 Feb;55(2):199-209. PMID: 20546095; X-5
880. Charman T. Commentary: Glass Half Full or Half Empty? Testing Social Communication Interventions for Young Children with Autism--Reflections on Landa, Holman, O'Neill, and Stuart (2011). Journal of Child Psychology and Psychiatry. 2011 January 2011;52(1):22-3. X-2, X-5
881. Charnsil C. Efficacy of atomoxetine in children with severe autistic disorders and symptoms of ADHD: an open-label study. J Atten Disord. 2011 Nov;15(8):684-9. PMID: 20686100; X-1, X-3
882. Chase CA. An Intergenerational E-Mail Pal Project on Attitudes of College Students toward Older Adults. Educational Gerontology. 2011;37(1):27-37. X-5
883. Chevallier C, Noveck I, Happe F, et al. What's in a voice? Prosody as a test case for the Theory of Mind account of autism. Neuropsychologia. 2011 Feb;49(3):507-17. PMID: 21134386; X-5
884. Chiang IT, Chen M-L. Embracing Complexity: Using Technology to Develop a Life-Long Learning Model for Non-Working Time in the Interdependent Homes for Adults with Autism Spectrum Disorders. Turkish Online Journal of Educational Technology - TOJET. 2011;10(4):174-80. X-5
885. Chien IC, Lin CH, Chou YJ, et al. Prevalence and incidence of autism spectrum disorders among national health insurance enrollees in Taiwan from 1996 to 2005. J Child Neurol. 2011 Jul;26(7):830-4. PMID: 21460178; X-5
886. Childress DC. Play Behaviors of Parents and Their Young Children with Disabilities. Topics in Early Childhood Special Education. 2011;31(2):112-20. X-5
887. Cho W, Kielar KN, Mok E, et al. Multisource modeling of flattening filter free (FFF) beam and the optimization of model parameters. Med Phys. 2011 Apr;38(4):1931-42. PMID: 21626926; X-5
888. Choi YB, Li HL, Kassabov SR, et al. Neurexin-neuroligin transsynaptic interaction mediates learning-related synaptic remodeling and long-term facilitation in aplysia. Neuron. 2011 May 12;70(3):468-81. PMID: 21555073; X-5
889. Chung SY, Yoon HJ. A framework for treatment of autism using affective computing. Stud Health Technol Inform. 2011;163:132-4. PMID: 21335775; X-5
890. Chung TK, Lynch ER, Fiser CJ, et al. Psychiatric comorbidity and treatment response in patients with tuberous sclerosis complex. Ann Clin Psychiatry. 2011 Nov;23(4):263-9. PMID: 22073383; X-5
891. Cihak DF. Comparing Pictorial and Video Modeling Activity Schedules during Transitions for Students with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2011;5(1):433-41. X-3, X-5
892. Cimera RE, Burgess S. Do adults with autism benefit monetarily from working in their communities? Journal of Vocational Rehabilitation. 2011;34(3):173-80. X-5
893. Cleary MJ. Developments in Neurofeedback: Should Health Educators Be Paying Attention? Health Educator. 2011;43(2):21-6. X-5
894. Collins A, Dworkin RJ. Pilot study of the effectiveness of weighted vests. Am J Occup Ther. 2011 Nov-Dec;65(6):688-94. PMID: 22214113; X-1, X-3, X-4
895. Corbett BA, Gunther JR, Comins D, et al. Brief report: theatre as therapy for children with autism spectrum disorder. J Autism Dev Disord. 2011 Apr;41(4):505-11. PMID: 20640592; X-3
896. Coulter ME, Miller DT, Harris DJ, et al. Chromosomal microarray testing influences medical management. Genet Med. 2011 Sep;13(9):770-6. PMID: 21716121; X-5
897. Coupienne I, Bontems S, Dewaele M, et al. NF-kappaB inhibition improves the sensitivity of human glioblastoma cells to 5-aminolevulinic acid-based photodynamic therapy. Biochem Pharmacol. 2011 Mar 1;81(5):606-16. PMID: 21182827; X-5
898. Crighton P. Vaccines need a shot in the arm. Aust Nurs J. 2011 May;18(10):40-1. PMID: 21667703; X-5
899. Croen LA, Grether JK, Yoshida CK, et al. Antidepressant use during pregnancy and childhood autism spectrum disorders. Arch Gen Psychiatry. 2011 Nov;68(11):1104-12. PMID: 21727247; X-5
900. Curran MP. Aripiprazole in the treatment of irritability associated with autistic disorder in paediatric patients. CNS Drugs. 2011;25(9):801-2. X-1, X-2, X-3, X-4

901. Cusmai R, Moavero R, Bombardieri R, et al. Long-term neurological outcome in children with early-onset epilepsy associated with tuberous sclerosis. Epilepsy Behav. 2011 Dec;22(4):735-9. PMID: 22142783; X-5
902. Daley MF, Glanz JM. Straight talk about vaccination. Sci Am. 2011 Sep;305(3):32, 4. PMID: 21870438; X-5
903. Danzer E, Gerdes M, Bebbington MW, et al. Preschool neurobehavioral outcome following fetal myelomeningocele surgery. Fetal Diagn Ther. 2011;30(3):174-9. PMID: 21912086; X-5
904. Dardennes RM, Al Anbar NN, Prado-Netto A, et al. Treating the cause of illness rather than the symptoms: parental causal beliefs and treatment choices in autism spectrum disorder. Res Dev Disabil. 2011 May-Jun;32(3):1137-46. PMID: 21316189; X-5
905. Darretxe L, Sepulveda L. Educational Strategies to Address the Educational Needs of Students with Asperger Syndrome in the Mainstream Classroom. Electronic Journal of Research in Educational Psychology. 2011;9(2):869-92. X-5
906. David N, T RS, Vogeley K, et al. Impairments in multisensory processing are not universal to the autism spectrum: no evidence for crossmodal priming deficits in Asperger syndrome. Autism Res. 2011 Oct;4(5):383-8. PMID: 21882310; X-5
907. Davidovitch M, Golan D, Vardi O, et al. Israeli children with autism spectrum disorder are not macrocephalic. Journal of Child Neurology. 2011;26(5):580-5. X-5
908. Davis TN, Durand S, Chan JM. The Effects of a Brushing Procedure on Stereotypical Behavior. Research in Autism Spectrum Disorders. 2011;5(3):1053-8. X-3
909. Davit CJ, Hundley RJ, Bacic JD, et al. A pilot study to improve venipuncture compliance in children and adolescents with autism spectrum disorders. J Dev Behav Pediatr. 2011 Sep;32(7):521-5. PMID: 21694630; X-4
910. Dawson G, Burner K. Behavioral interventions in children and adolescents with autism spectrum disorder: a review of recent findings. Curr Opin Pediatr. 2011 Dec;23(6):616-20. PMID: 22037220; X-2, X-5
911. De Leo G, Gonzales CH, Battagiri P, et al. A smart-phone application and a companion website for the improvement of the communication skills of children with autism: clinical rationale, technical development and preliminary results. J Med Syst. 2011 Aug;35(4):703-11. PMID: 20703781; X-3, X-4
912. Delong G. A positive association found between autism prevalence and childhood vaccination uptake across the U.S. population. J Toxicol Environ Health A. 2011;74(14):903-16. PMID: 21623535; X-5
913. Demb H, Valicenti-McDermott M, Navarro A, et al. The effect of long-term use of risperidone on body weight of children with an autism spectrum disorder. Journal of Clinical Psychopharmacology. 2011;31(5):669-70. X-5
914. Devlin S, Healy O, Leader G, et al. Comparison of behavioral intervention and sensory-integration therapy in the treatment of challenging behavior. J Autism Dev Disord. 2011 Oct;41(10):1303-20. PMID: 21161577; X-3
915. Dickstein-Fischer L, Alexander E, Yan X, et al. An affordable compact humanoid robot for Autism Spectrum Disorder interventions in children. Conf Proc IEEE Eng Med Biol Soc. 2011;2011:5319-22. PMID: 22255539; X-5
916. DiGennaro Reed FD, Hyman SR, Hirst JM. Applications of Technology to Teach Social Skills to Children with Autism. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2011. p. 1003-10. X-3, X-4
917. DiGennaro Reed FD, Reed DD, Baez CN, et al. A Parametric Analysis of Errors of Commission during Discrete-Trial Training. Journal of Applied Behavior Analysis. 2011;44(3):611-5. X-3, X-5
918. Dillenburger K. The Emperor's New Clothes: Eclecticism in Autism Treatment. Research in Autism Spectrum Disorders. 2011;5(3):1119-28. X-5
919. Dingfelder HE, Mandell DS. Bridging the research-to-practice gap in autism intervention: an application of diffusion of innovation theory. J Autism Dev Disord. 2011 May;41(5):597-609. PMID: 20717714; X-5
920. Dionne M, Martini R. Floor time play with a child with autism: A single-subject study. Canadian Journal of Occupational Therapy/ Revue Canadienne D'Ergothérapie. 2011;78(3):196-203. X-3
921. Dittlinger LH, Lerman DC. Further Analysis of Picture Interference when Teaching Word Recognition to Children with Autism. Journal of Applied Behavior Analysis. 2011;44(2):341-9. X-3, X-5
922. Dixon DR, Tarbox J, Najdowski AC, et al. A Comprehensive Evaluation of Language for Early Behavioral Intervention Programs: The Reliability of the SKILLS Language Index. Research in Autism Spectrum Disorders. 2011;5(1):506-11. X-5
923. Dixon M, Baker JC, Sadowski KA. Applying Skinner's Analysis of Verbal Behavior to Persons with Dementia. Behavior Therapy. 2011;42(1):120-6. X-5
924. Dodd JL, Ocampo A, Kennedy KS. Perspective Taking through Narratives: An Intervention for Students with ASD. Communication Disorders Quarterly. 2011;33(1):23-33. X-5
925. Donaldson JM, Vollmer TR. An Evaluation and Comparison of Time-Out Procedures with and without Release Contingencies. Journal of Applied Behavior Analysis. 2011;44(4):693-705. X-3
926. Donaldson SO, Elder JH, Self EH, et al. Fathers' perceptions of their roles during in-home training for children with autism. J Child Adolesc Psychiatr Nurs. 2011 Nov;24(4):200-7. PMID: 22044567; X-5

927. Donoghue K, Stallard P, Kucia J. The clinical practice of Cognitive Behavioural Therapy for children and young people with a diagnosis of Asperger's Syndrome. Clin Child Psychol Psychiatry. 2011 Jan;16(1):89-102. PMID: 20516059; X-5
928. Dotto-Fojut KM, Reeve KF, Townsend DB, et al. Teaching adolescents with autism to describe a problem and request assistance during simulated vocational tasks. Research in Autism Spectrum Disorders. 2011;5(2):826-33. X-5
929. Doty KJ. Student perceptions of progress in a postsecondary residential program for adults with learning disabilities. J Soc Work Disabil Rehabil. 2011;10(3):150-65. PMID: 21827300; X-5
930. Doughty AH, Hopkins MN. Reducing Stimulus Overselectivity through an Increased Observing-Response Requirement. Journal of Applied Behavior Analysis. 2011;44(3):653-7. X-5
931. Doyen C, Mighiu D, Kaye K, et al. Melatonin in children with autistic spectrum disorders: Recent and practical data. European Child & Adolescent Psychiatry. 2011;20(5):231-9. X-2, X-5
932. Doyle T, Arnedillo-Sanchez I. Using Multimedia to Reveal the Hidden Code of Everyday Behaviour to Children with Autistic Spectrum Disorders (ASDs). Computers & Education. 2011;56(2):357-69. X-4
933. Dozier CL, Iwata BA, Worsdell AS. Assessment and Treatment of Foot-Shoe Fetish Displayed by a Man with Autism. Journal of Applied Behavior Analysis. 2011;44(1):133-7. X-5
934. Duffy C, Healy O. Spontaneous Communication in Autism Spectrum Disorder: A Review of Topographies and Interventions. Research in Autism Spectrum Disorders. 2011;5(3):977-83. X-2, X-5
935. Duke TS. Lesbian, Gay, Bisexual, and Transgender Youth with Disabilities: A Meta-Synthesis. Routledge. , 325 Chestnut Street Suite 800, Philadelphia, PA 19106.; 2011. p. 1-52. X-4
936. Dunst CJ, Trivette CM, Masiello T. Exploratory investigation of the effects of interest-based learning on the development of young children with autism. Autism. 2011 May;15(3):295-305. PMID: 21430019; X-5
937. Edrisinha C, O'Reilly MF, Choi HY, et al. "Say Cheese": teaching photography skills to adults with developmental disabilities. Res Dev Disabil. 2011 Mar-Apr;32(2):636-42. PMID: 21227636; X-5
938. Ekas NV, Whitman TL. Adaptation to daily stress among mothers of children with an autism spectrum disorder: the role of daily positive affect. J Autism Dev Disord. 2011 Sep;41(9):1202-13. PMID: 21125322; X-5
939. Elson N. Which Way Next? What Is the Real Choice for Students Leaving a Special School? Support for Learning. 2011;26(4):152-9. X-5
940. Enticott PG, Kennedy HA, Zangen A, et al. Deep repetitive transcranial magnetic stimulation associated with improved social functioning in a young woman with an autism spectrum disorder. The Journal of ECT. 2011;27(1):41-3. X-3, X-5
941. Erdmann J. Broad collaborations bring new energy to autism therapeutics. Chem Biol. 2011 Feb 25;18(2):142-3. PMID: 21338911; X-5
942. Erginousakis D, Filippiadis DK, Malagari A, et al. Comparative prospective randomized study comparing conservative treatment and percutaneous disk decompression for treatment of intervertebral disk herniation. Radiology. 2011 Aug;260(2):487-93. PMID: 21613439; X-5
943. Erickson CA, Early M, Stigler KA, et al. An open-label naturalistic pilot study of acamprosate in youth with autistic disorder. J Child Adolesc Psychopharmacol. 2011 Dec;21(6):565-9. PMID: 22136091; X-3
944. Erickson CA, Stigler KA, Wink LK, et al. A prospective open-label study of aripiprazole in fragile X syndrome. Psychopharmacology (Berl). 2011 Jul;216(1):85-90. PMID: 21318565; X-5
945. Erickson CA, Weng N, Weiler IJ, et al. Open-label riluzole in fragile X syndrome. Brain Res. 2011 Mar 22;1380:264-70. PMID: 21059347; X-5
946. Eskow K, Pineles L, Summers JA. Exploring the effect of autism waiver services on family outcomes. Journal of Policy and Practice in Intellectual Disabilities. 2011;8(1):28-35. X-5
947. Estes A, Rivera V, Bryan M, et al. Discrepancies between Academic Achievement and Intellectual Ability in Higher-Functioning School-Aged Children with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders. 2011;41(8):1044-52. X-5
948. Fallon MA, Zhang J, Kim E-J. Using Course Assessments to Train Teachers in Functional Behavior Assessment and Behavioral Intervention Plan Techniques. Journal of the International Association of Special Education. 2011;12(1):50-8. X-5
949. Fava L, Strauss K. Cross-setting complementary staff- and parent-mediated Early Intensive Behavioral Intervention for young children with autism: A research-based comprehensive approach. Research in Autism Spectrum Disorders. 2011;5(1):512-22. X-1, X-2, X-3, X-4
950. Fecteau S, Agosta S, Oberman L, et al. Brain stimulation over Broca's area differentially modulates naming skills in neurotypical adults and individuals with Asperger's syndrome. Eur J Neurosci. 2011 Jul;34(1):158-64. PMID: 21676037; X-5

951. Fernandes FD, Amato CA, Balestro JI, et al. Orientation to mothers of children of the autistic spectrum about language and communication. J Soc Bras Fonoaudiol. 2011 Mar;23(1):1-7. PMID: 21552725; X-5
952. Fernell E, Hedvall A, Westerlund J, et al. Early intervention in 208 Swedish preschoolers with autism spectrum disorder. A prospective naturalistic study. Res Dev Disabil. 2011 Nov-Dec;32(6):2092-101. PMID: 21985993; X-5
953. Ferraioli SJ, Harris SL. Teaching joint attention to children with autism through a sibling-mediated behavioral intervention. Behavioral Interventions. 2011;26(4):261-81. X-3
954. Finegold SM. State of the art; microbiology in health and disease. Intestinal bacterial flora in autism. Anaerobe. 2011 Dec;17(6):367-8. PMID: 21524713; X-5
955. Fitzpatrick M. Warehousing. Br J Gen Pract. 2011 Jul;61(588):466. PMID: 21722473; X-5
956. Flippin M, Crais ER. The Need for More Effective Father Involvement in Early Autism Intervention: A Systematic Review and Recommendations. Journal of Early Intervention. 2011;33(1):24-50. X-1, X-3, X-4
957. Flippin M, Watson LR. Relationships between the Responsiveness of Fathers and Mothers and the Object Play Skills of Children with Autism Spectrum Disorders. Journal of Early Intervention. 2011;33(3):220-34. X-5
958. Fong SS, Lee VY, Chan NN, et al. Motor ability and weight status are determinants of out-of-school activity participation for children with developmental coordination disorder. Res Dev Disabil. 2011 Nov-Dec;32(6):2614-23. PMID: 21767931; X-5
959. Fountain C, King MD, Bearman PS. Age of diagnosis for autism: Individual and community factors across 10 birth cohorts. Journal of Epidemiology and Community Health. 2011;65(6):503-10. X-5
960. Fragala-Pinkham MA, Haley SM, O'Neil ME. Group swimming and aquatic exercise programme for children with autism spectrum disorders: a pilot study. Dev Neurorehabil. 2011;14(4):230-41. PMID: 21732807; X-4
961. Frankel FD, Gorospe CM, Chang Y-C, et al. Mothers' Reports of Play Dates and Observation of School Playground Behavior of Children Having High-Functioning Autism Spectrum Disorders. Journal of Child Psychology and Psychiatry. 2011;52(5):571-9. X-4
962. Fraser R, Angus B, Cotton S, et al. Prevalence of autism spectrum conditions in a youth mental health service. Australian and New Zealand Journal of Psychiatry. 2011;45(5):426. X-5
963. Frazier TW, Shattuck PT, Narendorf SC, et al. Prevalence and correlates of psychotropic medication use in adolescents with an autism spectrum disorder with and without caregiver-reported attention-deficit/hyperactivity disorder. J Child Adolesc Psychopharmacol. 2011 Dec;21(6):571-9. PMID: 22166171; X-5
964. Freilinger M, Dunkler D, Lanator I, et al. Effects of creatine supplementation in Rett syndrome: A randomized, placebo-controlled trial. Journal of Developmental and Behavioral Pediatrics. 2011;32(6):454-60. X-5
965. Froehlich W. Making a case to continue considering treatment with selective serotonin reuptake inhibitors for children with autism spectrum disorders. Curr Psychiatry Rep. 2011 Jun;13(3):170-3. PMID: 21404127; X-1, X-2, X-3, X-4
966. Frye RE, Sreenivasula S, Adams JB. Traditional and non-traditional treatments for autism spectrum disorder with seizures: an on-line survey. BMC Pediatr. 2011;11:37. PMID: 21592359; X-5
967. Fukuhara H, Inoue K, Satake H, et al. Photodynamic diagnosis of positive margin during radical prostatectomy: preliminary experience with 5-aminolevulinic acid. Int J Urol. 2011 Aug;18(8):585-91. PMID: 21658132; X-5
968. Gadberry AL. A survey of the use of aided augmentative and alternative communication during music therapy sessions with persons with autism spectrum disorders. J Music Ther. 2011 Spring;48(1):74-89. PMID: 21866714; X-5
969. Gale CM, Eikeseth S, Rudrud E. Functional assessment and behavioural intervention for eating difficulties in children with autism: a study conducted in the natural environment using parents and ABA tutors as therapists. J Autism Dev Disord. 2011 Oct;41(10):1383-96. PMID: 21181250; X-3
970. Galletly SA, Knight BA. Differential Disadvantage of Anglophone Weak Readers Due to English Orthographic Complexity and Cognitive Processing Weakness. Australasian Journal of Special Education. 2011;35(1):72-96. X-5
971. Gallup GG, Jr., Hobbs DR. Evolutionary medicine: bottle feeding, birth spacing, and autism. Med Hypotheses. 2011 Sep;77(3):345-6. PMID: 21641730; X-5
972. Ganz JB, Earles-Vollrath TL, Cook KE. Video Modeling: A Visually Based Intervention for Children with Autism Spectrum Disorder. TEACHING Exceptional Children. 2011;43(6):8-19. X-1, X-2, X-3, X-4
973. Ganz JB, Earles-Vollrath TL, Mason RA, et al. An Aggregate Study of Single-Case Research Involving Aided AAC: Participant Characteristics of Individuals with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2011;5(4):1500-9. X-5

974. Ganz JB, Flores MM, Lashley EE. Effects of a Treatment Package on Imitated and Spontaneous Verbal Requests in Children with Autism. Education and Training in Autism and Developmental Disabilities. 2011;46(4):596-606. X-3
975. Garcia-Villamisar D, Dattilo J. Social and Clinical Effects of a Leisure Program on Adults with Autism Spectrum Disorder. Research in Autism Spectrum Disorders. 2011;5(1):246-53. X-5
976. Gargaro BA, Rinehart NJ, Bradshaw JL, et al. Autism and ADHD: how far have we come in the comorbidity debate? Neurosci Biobehav Rev. 2011 Apr;35(5):1081-8. PMID: 21093480; X-5
977. Gaspar de Alba MJ, Bodfish JW. Addressing Parental Concerns at the Initial Diagnosis of an Autism Spectrum Disorder. Research in Autism Spectrum Disorders. 2011;5(1):633-9. X-5
978. Gattino GS, dos Santos Riesgo R, Longo D, et al. Effects of relational music therapy on communication of children with autism: A randomized controlled study. Nordisk tidskrift for musikkterapi - Nordic Journal of Music Therapy. 2011;20(2):142-54. X-5
979. Geier DA, Kern JK, Davis G, et al. A prospective double-blind, randomized clinical trial of levocarnitine to treat autism spectrum disorders. Med Sci Monit. 2011 Jun;17(6):PI15-23. PMID: 21629200; X-5
980. Gerber F, Bessero S, Robbiani B, et al. Comparing residential programmes for adults with autism spectrum disorders and intellectual disability: outcomes of challenging behaviour and quality of life. J Intellect Disabil Res. 2011 Sep;55(9):918-32. PMID: 21806693; X-5
981. Ghanizadeh A. Targeting of glycine site on NMDA receptor as a possible new strategy for autism treatment. Neurochem Res. 2011 May;36(5):922-3. PMID: 21210221; X-5
982. Ghanizadeh A. Can ziconotide as a N-type voltage-sensitive calcium channel blocker open a new mode for treatment of autism? A hypothesis. Neurosciences (Riyadh). 2011 Jan;16(1):83. PMID: 21206454; X-5
983. Ghoneim OM, Ibrahim DA, El-Deeb IM, et al. A novel potential therapeutic avenue for autism: design, synthesis and pharmacophore generation of SSRIs with dual action. Bioorg Med Chem Lett. 2011 Nov 15;21(22):6714-23. PMID: 21982496; X-5
984. Gibbs V, Toth-Cohen S. Family-centered occupational therapy and telerehabilitation for children with autism spectrum disorders. Occupational Therapy In Health Care. 2011;25(4):298-314. X-3
985. Gillesen JC, Barakova EI, Huskens BE, et al. From training to robot behavior: towards custom scenarios for robotics in training programs for ASD. IEEE Int Conf Rehabil Robot. 2011;2011:5975381. PMID: 22275585; X-5
986. Glaser SE, Shaw SR. Emotion Regulation and Development in Children with Autism and 22q13 Deletion Syndrome: Evidence for Group Differences. Research in Autism Spectrum Disorders. 2011;5(2):926-34. X-5
987. Goldman LE, Chu PW, Osmond D, et al. The accuracy of present-on-admission reporting in administrative data. Health Serv Res. 2011 Dec;46(6pt1):1946-62. PMID: 22092023; X-1, X-3, X-4, X-5
988. Golubchik P, Sever J, Weizman A. Low-dose quetiapine for adolescents with autistic spectrum disorder and aggressive behavior: open-label trial. Clin Neuropharmacol. 2011 Nov-Dec;34(6):216-9. PMID: 21996644; X-5
989. Gomot M, Blanc R, Clery H, et al. Candidate electrophysiological endophenotypes of hyper-reactivity to change in autism. J Autism Dev Disord. 2011 Jun;41(6):705-14. PMID: 20827502; X-5
990. Gonzalez A, Stombaugh J, Lozupone C, et al. The mind-body-microbial continuum. Dialogues Clin Neurosci. 2011;13(1):55-62. PMID: 21485746; X-5
991. Gooding LF. The effect of a music therapy social skills training program on improving social competence in children and adolescents with social skills deficits. J Music Ther. 2011 Winter;48(4):440-62. PMID: 22506299; X-5
992. Goodman G, Athey-Lloyd L. Interaction structures between a child and two therapists in the psychodynamic treatment of a child with Asperger's disorder. Journal of Child Psychotherapy. 2011;37(3):311-26. X-3, X-5
993. Gordon K, Pasco G, McElduff F, et al. A communication-based intervention for nonverbal children with autism: what changes? Who benefits? J Consult Clin Psychol. 2011 Aug;79(4):447-57. PMID: 21787048; X-5
994. Gould E, Dixon DR, Najdowski AC, et al. A Review of Assessments for Determining the Content of Early Intensive Behavioral Intervention Programs for Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2011;5(3):990-1002. X-5
995. Gray K, Jenkins AC, Heberlein AS, et al. Distortions of mind perception in psychopathology. Proc Natl Acad Sci U S A. 2011 Jan 11;108(2):477-9. PMID: 21187372; X-5
996. Greer DR, Pistoljevic N, Cahill C, et al. Effects of Conditioning Voices as Reinforcers for Listener Responses on Rate of Learning, Awareness, and Preferences for Listening to Stories in Preschoolers with Autism. Analysis of Verbal Behavior. 2011;27:103-24. X-3
997. Griffin MM. Promoting IEP Participation: Effects of Interventions, Considerations for CLD Students. Career Development for Exceptional Individuals. 2011;34(3):153-64. X-5

998. Griffith GM, Hastings RP, Oliver C, et al. Psychological well-being in parents of children with Angelman, Cornelia de Lange and Cri du Chat syndromes. J Intellect Disabil Res. 2011 Apr;55(4):397-410. PMID: 21323782; X-5
999. Grimmsmann T, Himmel W. Discrepancies between prescribed and defined daily doses: a matter of patients or drug classes? Eur J Clin Pharmacol. 2011 Aug;67(8):847-54. PMID: 21544512; X-1, X-3, X-4, X-5
1000. Groskreutz MP, Groskreutz NC, Higbee TS. Response Competition and Stimulus Preference in the Treatment of Automatically Reinforced Behavior: A Comparison. Journal of Applied Behavior Analysis. 2011;44(1):211-5. X-3
1001. Groskreutz NC, Groskreutz MP, Higbee TS. Effects of varied levels of treatment integrity on appropriate toy manipulation in children with autism. Research in Autism Spectrum Disorders. 2011;5(4):1358-69. X-3
1002. Grow LL, Carr JE, Kodak TM, et al. A comparison of methods for teaching receptive labeling to children with autism spectrum disorders. J Appl Behav Anal. 2011 Fall;44(3):475-98. PMID: 21941380; X-3
1003. Guiraud JA, Kushnerenko E, Tomalski P, et al. Differential habituation to repeated sounds in infants at high risk for autism. Neuroreport. 2011 Nov 16;22(16):845-9. PMID: 21934535; X-1, X-3, X-4
1004. Guldberg K, Parsons S, MacLeod A, et al. Implications for Practice from "International Review of the Evidence on Best Practice in Educational Provision for Children on the Autism Spectrum". European Journal of Special Needs Education. 2011;26(1):65-70. X-2, X-5
1005. Gura GF, Champagne MT, Blood-Siegfried JE. Autism spectrum disorder screening in primary care. Journal of Developmental and Behavioral Pediatrics. 2011;32(1):48-51. X-5
1006. Hagebeuk EEO, Koelman JHTM, Duran M, et al. Clinical and electroencephalographic effects of folinic acid treatment in Rett syndrome patients. Journal of Child Neurology. 2011;26(6):718-23. X-5
1007. Hagopian LP, González ML, Rivet TT, et al. Response interruption and differential reinforcement of alternative behavior for the treatment of pica. Behavioral Interventions. 2011;26(4):309-25. X-3
1008. Hall HR, Graff JC. The relationships among adaptive behaviors of children with autism, family support, parenting stress, and coping. Issues Compr Pediatr Nurs. 2011;34(1):4-25. PMID: 21341964; X-3, X-4, X-5
1009. Hamilton A, Marshal MP, Murray PJ. Autism spectrum disorders and menstruation. J Adolesc Health. 2011 Oct;49(4):443-5. PMID: 21939879; X-5
1010. Hammond JL, Iwata BA, Fritz JN, et al. Evaluation of Fixed Momentary DRO Schedules under Signaled and Unsignaled Arrangements. Journal of Applied Behavior Analysis. 2011;44(1):69-81. X-3
1011. Hampson DR, Adusei DC, Pacey LK. The neurochemical basis for the treatment of autism spectrum disorders and Fragile X Syndrome. Biochem Pharmacol. 2011 May 1;81(9):1078-86. PMID: 21333634; X-5
1012. Handen BL, Johnson CR, McAuliffe-Bellin S, et al. Safety and efficacy of donepezil in children and adolescents with autism: neuropsychological measures. J Child Adolesc Psychopharmacol. 2011 Feb;21(1):43-50. PMID: 21309696; X-5
1013. Hart C. Can We, Can't We, Can We, Can't We, Can We Help Him Join the Dance? The Need for Multimodal Processing in the Move towards Meaningful Communication. Journal of Child Psychotherapy. 2011;37(1):16-30. X-3, X-5
1014. Hart JE, Whalon KJ. Creating Social Opportunities for Students with Autism Spectrum Disorder in Inclusive Settings. Intervention in School and Clinic. 2011;46(5):273-9. X-5
1015. Hartley SL, Seltzer MM, Raspa M, et al. Exploring the adult life of men and women with fragile X syndrome: results from a national survey. Am J Intellect Dev Disabil. 2011 Jan;116(1):16-35. PMID: 21291308; X-5
1016. Hayakawa K, Kobayashi K. Physical and motor skill training for children with intellectual disabilities. Percept Mot Skills. 2011 Apr;112(2):573-80. PMID: 21667765; X-5
1017. Hayes S, McGuire B, O'Neill M, et al. Low mood and challenging behaviour in people with severe and profound intellectual disabilities. J Intellect Disabil Res. 2011 Feb;55(2):182-9. PMID: 21129068; X-5
1018. Hellings JA, Boehm D, Yeh HW, et al. Long-term aripiprazole in youth with developmental disabilities including autism. Journal of Mental Health Research in Intellectual Disabilities. 2011;4(1):40-52. X-1, X-3
1019. Hernandez P, Ikkanda Z. Applied behavior analysis: behavior management of children with autism spectrum disorders in dental environments. J Am Dent Assoc. 2011 Mar;142(3):281-7. PMID: 21357862; X-1, X-2, X-3 ,X-4
1020. Hill DA, Martin DE, Nelson-Head C. Examination of Case Law (2007-2008) regarding Autism Spectrum Disorder and Violations of the Individuals with Disabilities Education Act. Routledge. , 325 Chestnut Street Suite 800, Philadelphia, PA 19106.; 2011. p. 214-25. X-4
1021. Hillier AJ, Fish T, Siegel JH, et al. Social and vocational skills training reduces self-reported anxiety and depression among young adults on the autism spectrum. Journal of Developmental and Physical Disabilities. 2011;23(3):267-76. X-5

1022. Hillock AR, Powers AR, Wallace MT. Binding of sights and sounds: age-related changes in multisensory temporal processing. Neuropsychologia. 2011 Feb;49(3):461-7. PMID: 21134385; X-5
1023. Hines M, Balandin S, Togher L. Communication and AAC in the lives of adults with autism: the stories of their older parents. Augment Altern Commun. 2011 Dec;27(4):256-66. PMID: 22136364; X-5
1024. Hodgetts S, Magill-Evans J, Misiaszek J. Effects of Weighted Vests on Classroom Behavior for Children with Autism and Cognitive Impairments. Research in Autism Spectrum Disorders. 2011;5(1):495-505. X-4
1025. Hodgetts S, Magill-Evans J, Misiaszek JE. Weighted vests, stereotyped behaviors and arousal in children with autism. J Autism Dev Disord. 2011 Jun;41(6):805-14. PMID: 20839040; X-3
1026. Holding E, Bray MA, Kehle TJ. Does Speed Matter? A Comparison of the Effectiveness of Fluency and Discrete Trial Training for Teaching Noun Labels to Children with Autism. Psychology in the Schools. 2011;48(2):166-83. X-3
1027. Holtmann M, Steiner S, Hohmann S, et al. Neurofeedback in Autism Spectrum Disorders. Wiley-Blackwell. 350 Main Street, Malden, MA 02148.; 2011. p. 986-93. X-1, X-2
1028. Hopkins IM, Gower MW, Perez TA, et al. Avatar assistant: improving social skills in students with an ASD through a computer-based intervention. J Autism Dev Disord. 2011 Nov;41(11):1543-55. PMID: 21287255; X-1
1029. Howlett MA, Sidener TM, Progar PR, et al. Manipulation of Motivating Operations and Use of a Script-Fading Procedure to Teach Mands for Location to Children with Language Delays. Journal of Applied Behavior Analysis. 2011;44(4):943-7. X-3
1030. Hsieh H-H, Wilder DA, Abellon EO. The Effects of Training on Caregiver Implementation of Incidental Teaching. Journal of Applied Behavior Analysis. 2011;44(1):199-203. X-3
1031. Hughes C. Changes and Challenges in 20 Years of Research into the Development of Executive Functions. Wiley-Blackwell. 111 River Street, Hoboken, NJ 07030-5774.; 2011. p. 251-71. X-4
1032. Hume K, Boyd B, McBee M, et al. Assessing implementation of comprehensive treatment models for young children with ASD: Reliability and validity of two measures. Research in Autism Spectrum Disorders. 2011;5(4):1430-40. X-1, X-3, X-4
1033. Hvidtjorn D, Grove J, Schendel D, et al. Risk of autism spectrum disorders in children born after assisted conception: a population-based follow-up study. J Epidemiol Community Health. 2011 Jun;65(6):497-502. PMID: 20584728; X-5
1034. Ingersoll B. The Differential Effect of Three Naturalistic Language Interventions on Language Use in Children with Autism. Journal of Positive Behavior Interventions. 2011 April 2011;13(2):109-18. X-3
1035. Ingvarsson ET, Hollobaugh T. A comparison of prompting tactics to establish intraverbals in children with autism. J Appl Behav Anal. 2011 Fall;44(3):659-64. PMID: 21941400; X-3
1036. Irwin JR, Tornatore LA, Brancazio L, et al. Can children with autism spectrum disorders "hear" a speaking face? Child Dev. 2011 Sep-Oct;82(5):1397-403. PMID: 21790542; X-5
1037. Isbell JS, Jolivette K. Stop, Think, Proceed: Solving Problems in the Real World. Intervention in School and Clinic. 2011;47(1):31-8. X-2, X-5
1038. Ishizuka M, Abe F, Sano Y, et al. Novel development of 5-aminolevurinic acid (ALA) in cancer diagnoses and therapy. Int Immunopharmacol. 2011 Mar;11(3):358-65. PMID: 21144919; X-5
1039. Jaber MA. Dental caries experience, oral health status and treatment needs of dental patients with autism. J Appl Oral Sci. 2011 May-Jun;19(3):212-7. PMID: 21625735; X-5
1040. Jang J, Dixon DR, Tarbox J, et al. Symptom Severity and Challenging Behavior in Children with ASD. Research in Autism Spectrum Disorders. 2011;5(3):1028-32. X-5
1041. Jarocka-Cyrta E, Wasilewska J, Kaczmarski MG. Brief Report: Eosinophilic Esophagitis as a Cause of Feeding Problems in Autistic Boy. The First Reported Case. Journal of Autism and Developmental Disorders. 2011;41(3):372-4. X-5
1042. Jepson B, Granpeesheh D, Tarbox J, et al. Controlled evaluation of the effects of hyperbaric oxygen therapy on the behavior of 16 children with autism spectrum disorders. J Autism Dev Disord. 2011 May;41(5):575-88. PMID: 20680427; X-5
1043. Johansson C, Ballard C, Hansson O, et al. Efficacy of memantine in PDD and DLB: an extension study including washout and open-label treatment. Int J Geriatr Psychiatry. 2011 Feb;26(2):206-13. PMID: 20665553; X-5
1044. Johnson JL, Brown S, Chang C, et al. The Cost of Serving Infants and Toddlers under Part C. Infants and Young Children. 2011;24(1):101-13. X-5
1045. Jones WE, Hoerger M, Hughes CJ, et al. ABA and Diverse Cultural and Linguistic Environments: A Welsh Perspective. Journal of Behavioral Education. 2011;20(4):297-305. X-5
1046. Jull S, Mirenda P. Parents as Play Date Facilitators for Preschoolers with Autism. Journal of Positive Behavior Interventions. 2011;13(1):17-30. X-3

1047. Kaluzna-Czaplinska J, Michalska M, Rynkowski J. Vitamin supplementation reduces the level of homocysteine in the urine of autistic children. Nutr Res. 2011 Apr;31(4):318-21. PMID: 21530806; X-4
1048. Kaluzna-Czaplinska J, Socha E, Rynkowski J. B vitamin supplementation reduces excretion of urinary dicarboxylic acids in autistic children. Nutr Res. 2011 Jul;31(7):497-502. PMID: 21840465; X-4
1049. Kamp-Becker I, Schroder J, Muehlan H, et al. Health-related quality of life in children and adolescents with autism spectrum disorder. Z Kinder Jugendpsychiatr Psychother. 2011 Mar;39(2):123-31. PMID: 21442600; X-5
1050. Kanai C, Iwanami A, Ota H, et al. Clinical characteristics of adults with Asperger's Syndrome assessed with self-report questionnaires. Research in Autism Spectrum Disorders. 2011;5(1):185-90. X-5
1051. Kang S, O'Reilly MF, Fragale CL, et al. Evaluation of the Rate of Problem Behavior Maintained by Different Reinforcers across Preference Assessments. Journal of Applied Behavior Analysis. 2011;44(4):835-46. X-5
1052. Karsten AM, Carr JE, Lepper TL. Description of a practitioner model for identifying preferred stimuli with individuals with autism spectrum disorders. Behav Modif. 2011 Jul;35(4):347-69. PMID: 21613240; X-5
1053. Keenan M, Dillenburger K. When All You Have Is a Hammer...: RCTs and Hegemony in Science. Research in Autism Spectrum Disorders. 2011;5(1):1-13. X-5
1054. Keintz KS, Miguel CF, Kao B, et al. Using Conditional Discrimination Training to Produce Emergent Relations between Coins and Their Values in Children with Autism. Journal of Applied Behavior Analysis. 2011;44(4):909-13. X-3
1055. Kern JK, Fletcher CL, Garver CR, et al. Prospective trial of equine-assisted activities in autism spectrum disorder. Altern Ther Health Med. 2011 May-Jun;17(3):14-20. PMID: 22164808; X-5
1056. Kern JK, Geier DA, Adams JB, et al. A clinical trial of glutathione supplementation in autism spectrum disorders. Med Sci Monit. 2011 Dec;17(12):CR677-82. PMID: 22129897; X-5
1057. Khanna R, Madhavan SS, Smith MJ, et al. Assessment of health-related quality of life among primary caregivers of children with autism spectrum disorders. J Autism Dev Disord. 2011 Sep;41(9):1214-27. PMID: 21103917; X-5
1058. King CR. A novel embryological theory of autism causation involving endogenous biochemicals capable of initiating cellular gene transcription: a possible link between twelve autism risk factors and the autism 'epidemic'. Med Hypotheses. 2011 May;76(5):653-60. PMID: 21388746; X-5
1059. Kishore MT, Basu A. Early concerns of mothers of children later diagnosed with autism: Implications for early identification. Research in Autism Spectrum Disorders. 2011;5(1):157-63. X-5
1060. Kite DM, Tyson GA, Gullifer JM. Exploring the Perception of Asperger's Disorder. Australasian Journal of Special Education. 2011;35(2):204-19. X-5
1061. Klenk JA, Pufpaff LA. A Case Study of Tack Tiles[R] Literacy Instruction for a Student with Multiple Disabilities Including Congenital Blindness. Physical Disabilities: Education and Related Services. 2011;30(2):48-66. X-3
1062. Kliebert ML, Tiger JH. Direct and distal effects of noncontingent juice on rumination exhibited by a child with autism. J Appl Behav Anal. 2011 Winter;44(4):955-9. PMID: 22219547; X-3
1063. Klintwall L, Holm A, Eriksson M, et al. Sensory abnormalities in autism. A brief report. Res Dev Disabil. 2011 Mar-Apr;32(2):795-800. PMID: 21111574; X-5
1064. Kobak KA, Stone WL, Ousley OY, et al. Web-based training in early autism screening: results from a pilot study. Telemed J E Health. 2011 Oct;17(8):640-4. PMID: 21939382; X-5
1065. Kobak KA, Stone WL, Wallace E, et al. A Web-based tutorial for parents of young children with autism: Results from a pilot study. Telemedicine and e-Health. 2011;17(10):804-8. X-4, X-5
1066. Kodak T, Fisher WW, Clements A, et al. Effects of Computer-Assisted Instruction on Correct Responding and Procedural Integrity during Early Intensive Behavioral Intervention. Research in Autism Spectrum Disorders. 2011;5(1):640-7. X-3
1067. Kodak T, Fisher WW, Clements A, et al. Functional assessment of instructional variables: Linking assessment and treatment. Research in Autism Spectrum Disorders. 2011;5(3):1059-77. X-4
1068. Koyama T, Wang H-T. Use of Activity Schedule to Promote Independent Performance of Individuals with Autism and Other Intellectual Disabilities: A Review. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2011. p. 2235-42. X-2
1069. Krajnc N, Župančič N, Oražem J. Epilepsy treatment in Rett syndrome. Journal of Child Neurology. 2011;26(11):1429-33. X-5
1070. Kroeger AK, Brown J. Placebo Medication Use for Behavior Management in an Adult with Autism. Education and Training in Autism and Developmental Disabilities. 2011;46(3):470-6. X-5

1071. Kruck S, Bedke J, Hennenlotter J, et al. Virtual bladder tumor transurethral resection: an objective evaluation tool to overcome learning curves with and without photodynamic diagnostics. Urol Int. 2011;87(2):138-42. PMID: 21860210; X-5
1072. Kurtz PF, Boelter EW, Jarmolowicz DP, et al. An Analysis of Functional Communication Training as an Empirically Supported Treatment for Problem Behavior Displayed by Individuals with Intellectual Disabilities. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2011. p. 2935-42. X-2, X-3, X-4
1073. Lahiri U, Warren Z, Sarkar N. Design of a gaze-sensitive virtual social interactive system for children with autism. IEEE Trans Neural Syst Rehabil Eng. 2011 Aug;19(4):443-52. PMID: 21609889; X-5
1074. Lampi KM, Banerjee PN, Gissler M, et al. Finnish Prenatal Study of Autism and Autism Spectrum Disorders (FIPS-A): overview and design. J Autism Dev Disord. 2011 Aug;41(8):1090-6. PMID: 21082229; X-5
1075. Lang R, Kuriakose S, Lyons G, et al. Use of School Recess Time in the Education and Treatment of Children with Autism Spectrum Disorders: A Systematic Review. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2011. p. 1296-305. X-4
1076. Lanovaz MJ, Sladeczek IE. Vocal Stereotypy in Children with Autism: Structural Characteristics, Variability, and Effects of Auditory Stimulation. Research in Autism Spectrum Disorders. 2011;5(3):1159-68. X-3
1077. Lanovaz MJ, Sladeczek IE, Rapp JT. Effects of music on vocal stereotypy in children with autism. J Appl Behav Anal. 2011 Fall;44(3):647-51. PMID: 21941398; X-3
1078. Larson HJ, Cooper LZ, Eskola J, et al. Addressing the vaccine confidence gap. Lancet. 2011 Aug 6;378(9790):526-35. PMID: 21664679; X-5
1079. Larsson V, Engedal K, Aarsland D, et al. Quality of life and the effect of memantine in dementia with lewy bodies and Parkinson's disease dementia. Dement Geriatr Cogn Disord. 2011;32(4):227-34. PMID: 22122992; X-5
1080. LaRue RH, Sloman KN, Weiss MJ, et al. Correspondence between traditional models of functional analysis and a functional analysis of manding behavior. Res Dev Disabil. 2011 Nov-Dec;32(6):2449-57. PMID: 21821393; X-3, X-5
1081. Leach D, LaRocque M. Increasing Social Reciprocity in Young Children with Autism. Intervention in School and Clinic. 2011;46(3):150-6. X-5
1082. Leaf RB, Taubman MT, McEachin JJ, et al. A program description of a community-based intensive behavioral intervention program for individuals with autism spectrum disorders. Education & Treatment of Children. 2011;34(2):259-85. X-5
1083. Lecavalier L, Gadow KD, Devincent CJ, et al. Validity of DSM-IV syndromes in preschoolers with Autism spectrum disorders. Autism. 2011;15(5):527-43. X-5
1084. Leekam SR, Prior MR, Uljarevic M. Restricted and Repetitive Behaviors in Autism Spectrum Disorders: A Review of Research in the Last Decade. Psychological Bulletin. 2011;137(4):562-93. X-1, X-2, X-3, X-4, X-5
1085. Lehtimaki KA, Liimatainen S, Peltola J, et al. The serum level of interleukin-6 in patients with intellectual disability and refractory epilepsy. Epilepsy Res. 2011 Jun;95(1-2):184-7. PMID: 21530175; X-5
1086. Lemmon ME, Gregas M, Jeste SS. Risperidone use in autism spectrum disorders: a retrospective review of a clinic-referred patient population. J Child Neurol. 2011 Apr;26(4):428-32. PMID: 20929907; X-5
1087. Lenne BS, Waldby C. Sorting out autism spectrum disorders: Evidence-based medicine and the complexities of the clinical encounter. Health Sociology Review. 2011;20(1):70-83. X-5
1088. Leoncini S, De Felice C, Signorini C, et al. Oxidative stress in Rett syndrome: natural history, genotype, and variants. Redox Rep. 2011;16(4):145-53. PMID: 21888765; X-5
1089. Leong HM, Stephenson J, Carter M. The Use of Sensory Integration Therapy by Intervention Service Providers in Malaysia. International Journal of Disability, Development and Education. 2011;58(4):341-58. X-1, X-3, X-4
1090. Lerner MD, Mikami AY, Levine K. Socio-dramatic affective-relational intervention for adolescents with asperger syndrome & high functioning autism: pilot study. Autism. 2011 Jan;15(1):21-42. PMID: 20923890; X-5
1091. Leu RM, Beyderman L, Botzolakis EJ, et al. Relation of Melatonin to Sleep Architecture in Children with Autism. Journal of Autism and Developmental Disorders. 2011;41(4):427-33. X-5
1092. Li J, Yan D, Duan L, et al. Percutaneous discectomy and drainage for postoperative intervertebral discitis. Arch Orthop Trauma Surg. 2011 Feb;131(2):173-8. PMID: 20490522; X-5
1093. Lierheimer K, Stichter J. Teaching Facial Expressions of Emotion. Beyond Behavior. 2011;21(1):20-7. X-3
1094. Light J, McNaughton D. Supporting the communication, language, and literacy development of children with complex communication needs: state of the science and future research priorities. Assist Technol. 2011 Spring;24(1):34-44. PMID: 22590798; X-2, X-3, X-4, X-5

1095. Lim HA, Draper E. The effects of music therapy incorporated with applied behavior analysis verbal behavior approach for children with autism spectrum disorders. J Music Ther. 2011 Winter;48(4):532-50. PMID: 22506303; X-5
1096. Lindsay G. The Collection and Analysis of Data on Children with Speech, Language and Communication Needs: The Challenge to Education and Health Services. Child Language Teaching and Therapy. 2011;27(2):135-50. X-5
1097. Liu ZH, Chuang DM, Smith CB. Lithium ameliorates phenotypic deficits in a mouse model of fragile X syndrome. Int J Neuropsychopharmacol. 2011 Jun;14(5):618-30. PMID: 20497624; X-5
1098. Loiacono V, Palumbo A. Principals Who Understand Applied Behavior Analysis Perceive They Are Better Able to Support Educators Who Teach Students with Autism. International Journal of Special Education. 2011;26(3):212-22. X-5
1099. Longo N, Ardon O, Vanzo R, et al. Disorders of creatine transport and metabolism. Am J Med Genet C Semin Med Genet. 2011 Feb 15;157(1):72-8. PMID: 21308988; X-5
1100. Low HM, Lee LW. Teaching of Speech, Language and Communication Skills for Young Children with Severe Autism Spectrum Disorders: What Do Educators Need to Know? New Horizons in Education. 2011;59(3):16-27. X-5
1101. Lyons G. Translation of Evidence-Based Practices in a Behaviour Support Implementation Model for Youth with Autism Spectrum Disorders. International Journal of Disability, Development and Education. 2011;58(4):409-15. X-5
1102. Mace FC, Pratt JL, Prager KL, et al. An evaluation of three methods of saying "no" to avoid an escalating response class hierarchy. J Appl Behav Anal. 2011 Spring;44(1):83-94. PMID: 21541139; X-5
1103. MacFabe DF, Cain NE, Boon F, et al. Effects of the enteric bacterial metabolic product propionic acid on object-directed behavior, social behavior, cognition, and neuroinflammation in adolescent rats: Relevance to autism spectrum disorder. Behav Brain Res. 2011 Feb 2;217(1):47-54. PMID: 20937326; X-5
1104. Magiati I, Moss J, Charman T, et al. Patterns of Change in Children with Autism Spectrum Disorders Who Received Community Based Comprehensive Interventions in Their Pre-School Years: A Seven Year Follow-Up Study. Research in Autism Spectrum Disorders. 2011;5(3):1016-27. X-5
1105. Magiati I, Moss J, Yates R, et al. Is the Autism Treatment Evaluation Checklist a useful tool for monitoring progress in children with autism spectrum disorders? J Intellect Disabil Res. 2011 Mar;55(3):302-12. PMID: 21199043; X-4
1106. Magnee MJ, de Gelder B, van Engeland H, et al. Multisensory integration and attention in autism spectrum disorder: evidence from event-related potentials. PLoS One. 2011;6(8):e24196. PMID: 21887382; X-5
1107. Makkonen I, Kokki H, Kuikka J, et al. Effects of fluoxetine treatment on striatal dopamine transporter binding and cerebrospinal fluid insulin-like growth factor-1 in children with autism. Neuropediatrics. 2011 Oct;42(5):207-9. PMID: 22015434; X-4
1108. Makkonen I, Riikonen R, Kuikka JT, et al. Brain derived neurotrophic factor and serotonin transporter binding as markers of clinical response to fluoxetine therapy in children with autism. Journal of Pediatric Neurology. 2011;9(1):1-8. X-5
1109. Maljaars J, Noens I, Jansen R, et al. Intentional Communication in Nonverbal and Verbal Low-Functioning Children with Autism. Journal of Communication Disorders. 2011;44(6):601-14. X-5
1110. Manning SE, Davin CA, Barfield WD, et al. Early diagnoses of autism spectrum disorders in Massachusetts birth cohorts, 2001–2005. Pediatrics. 2011;127(6):1043-51. X-4
1111. Manor-Binyamini I. Mothers of Children with Developmental Disorders in the Bedouin Community in Israel: Family Functioning, Caregiver Burden, and Coping Abilities. Journal of Autism and Developmental Disorders. 2011;41(5):610-7. X-5
1112. Marcus RN, Owen R, Manos G, et al. Aripiprazole in the treatment of irritability in pediatric patients (aged 6-17 years) with autistic disorder: results from a 52-week, open-label study. J Child Adolesc Psychopharmacol. 2011 Jun;21(3):229-36. PMID: 21663425; X-5
1113. Marcus RN, Owen R, Manos G, et al. Safety and tolerability of aripiprazole for irritability in pediatric patients with autistic disorder: a 52-week, open-label, multicenter study. J Clin Psychiatry. 2011 Sep;72(9):1270-6. PMID: 21813076; X-5
1114. Marcus SC, Durkin M. Stimulant adherence and academic performance in urban youth with attention-deficit/hyperactivity disorder. J Am Acad Child Adolesc Psychiatry. 2011 May;50(5):480-9. PMID: 21515197; X-5
1115. Marquenie K, Rodger S, Mangohig K, et al. Dinnertime and bedtime routines and rituals in families with a young child with an autism spectrum disorder. Aust Occup Ther J. 2011 Jun;58(3):145-54. PMID: 21599679; X-5

1116. Marui T, Funatogawa I, Koishi S, et al. The NADH-ubiquinone oxidoreductase 1 alpha subcomplex 5 (NDUFA5) gene variants are associated with autism. Acta Psychiatrica Scandinavica. 2011;123(2):118-24. X-5
1117. Marzullo-Kerth D, Reeve SA, Reeve KF, et al. Using multiple-exemplar training to teach a generalized repertoire of sharing to children with autism. J Appl Behav Anal. 2011 Summer;44(2):279-94. PMID: 21709784; X-3
1118. Mashal N, Kasirer A. Thinking maps enhance metaphoric competence in children with autism and learning disabilities. Research in Developmental Disabilities. 2011;32(6):2045-54. X-1, X-3
1119. Mason MC. Head for bed. Nurs Stand. 2011 Jan 26-Feb 1;25(21):20. PMID: 21329128; X-5
1120. Mathewson KJ, Drmic IE, Jetha MK, et al. Behavioral and cardiac responses to emotional stroop in adults with autism spectrum disorders: influence of medication. Autism Res. 2011 Apr;4(2):98-108. PMID: 21360828; X-5
1121. Matson JL, Hess JA. Psychotropic Drug Efficacy and Side Effects for Persons with Autism Spectrum Disorders. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2011. p. 230-6. X-2, X-3, X-4
1122. Matson JL, Kozlowski AM, Worley JA, et al. What Is the Evidence for Environmental Causes of Challenging Behaviors in Persons with Intellectual Disabilities and Autism Spectrum Disorders? Research in Developmental Disabilities: A Multidisciplinary Journal. 2011;32(2):693-8. X-5
1123. Matson JL, Rieske RD, Tureck K. Additional Considerations for the Early Detection and Diagnosis of Autism: Review of Available Instruments. Research in Autism Spectrum Disorders. 2011;5(4):1319-26. X-5
1124. Maurage P, Grynberg D, Noel X, et al. Dissociation between affective and cognitive empathy in alcoholism: a specific deficit for the emotional dimension. Alcohol Clin Exp Res. 2011 Sep;35(9):1662-8. PMID: 21599717; X-5
1125. Mavropoulou S, Papadopoulou E, Kakana D. Effects of task organization on the independent play of students with autism spectrum disorders. J Autism Dev Disord. 2011 Jul;41(7):913-25. PMID: 20960042; X-3
1126. Mays NM, Beal-Alvarez J, Jolivette K. Using Movement-Based Sensory Interventions to Address Self-Stimulatory Behaviors in Students with Autism. TEACHING Exceptional Children. 2011;43(6):46-52. X-1, X-2, X-3 ,X-4
1127. Mazzei D, Lazzeri N, Billeci L, et al. Development and evaluation of a social robot platform for therapy in autism. Conf Proc IEEE Eng Med Biol Soc. 2011;2011:4515-8. PMID: 22255342; X-1, X-3
1128. McLaughlin MR. Speech and language delay in children. Am Fam Physician. 2011 May 15;83(10):1183-8. PMID: 21568252; X-5
1129. McTiernan A, Leader G, Healy O, et al. Analysis of Risk Factors and Early Predictors of Challenging Behavior for Children with Autism Spectrum Disorder. Research in Autism Spectrum Disorders. 2011;5(3):1215-22. X-5
1130. Meindl JN, Cannella-Malone HI. Initiating and Responding to Joint Attention Bids in Children with Autism: A Review of the Literature. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2011. p. 1441-54. X-2, X-3, X-4
1131. Meltzer EC, Rybin D, Saitz R, et al. Identifying prescription opioid use disorder in primary care: diagnostic characteristics of the Current Opioid Misuse Measure (COMM). Pain. 2011 Feb;152(2):397-402. PMID: 21177035; X-5
1132. Menear KS, Smith SC. Teaching Physical Education to Students with Autism Spectrum Disorders. Strategies: A Journal for Physical and Sport Educators. 2011;24(3):21-4. X-5
1133. Mesibov GB, Shea V. Evidence-Based Practices and Autism. Autism: The International Journal of Research and Practice. 2011 January 2011;15(1):114-33. X-5
1134. Miller JS, Gabrielsen T, Villalobos M, et al. The each child study: systematic screening for autism spectrum disorders in a pediatric setting. Pediatrics. 2011 May;127(5):866-71. PMID: 21482605; X-1, X-3, X-4, X-5
1135. Minchella L, Preti L. Autism spectrum disorder: clinical considerations for the school nurse. NASN Sch Nurse. 2011 May;26(3):143-5. PMID: 21675293; X-5
1136. Ming X, Hashim A, Fleishman S, et al. Access to specialty care in autism spectrum disorders-a pilot study of referral source. BMC Health Serv Res. 2011;11:99. PMID: 21569571; X-5
1137. Minjarez MB, Williams SE, Mercier EM, et al. Pivotal response group treatment program for parents of children with autism. J Autism Dev Disord. 2011 Jan;41(1):92-101. PMID: 20440638; X-5
1138. Montes G, Halterman JS. White-black disparities in family-centered care among children with autism in the United States: evidence from the NS-CSHCN 2005-2006. Acad Pediatr. 2011 Jul-Aug;11(4):297-304. PMID: 21622042; X-5
1139. Montgomery J, Storey K, Post M, et al. The use of auditory prompting systems for increasing independent performance of students with autism in employment training. Int J Rehabil Res. 2011 Dec;34(4):330-5. PMID: 21885987; X-3, X-5

1140. Moore TR, a Timothy R, Symons FJ, et al. Adherence to Treatment in a Behavioral Intervention Curriculum for Parents of Children With Autism Spectrum Disorder. Behavior Modification. 2011;35(6):570-94. X-5
1141. Morag A, Pasmanik-Chor M, Oron-Karni V, et al. Genome-wide expression profiling of human lymphoblastoid cell lines identifies CHL1 as a putative SSRI antidepressant response biomarker. Pharmacogenomics. 2011 Feb;12(2):171-84. PMID: 21332311; X-5
1142. Morrier MJ, Hess KL, Heflin JL. Teacher Training for Implementation of Teaching Strategies for Students with Autism Spectrum Disorders. Teacher Education and Special Education. 2011;34(2):119-32. X-5
1143. Morrison H, Roscoe EM, Atwell A. An Evaluation of Antecedent Exercise on Behavior Maintained by Automatic Reinforcement Using a Three-Component Multiple Schedule. Journal of Applied Behavior Analysis. 2011;44(3):523-41. X-3
1144. Mulloy A, Lang R, O'Reilly M, et al. Addendum to "Gluten-Free and Casein-Free Diets in Treatment of Autism Spectrum Disorders: A Systematic Review". Research in Autism Spectrum Disorders. 2011 2011;5(1):86-8. X-4
1145. Murdock LC, Hobbs JQ. Tell Me What You Did Today: A Visual Cueing Strategy for Children with ASD. Focus on Autism and Other Developmental Disabilities. 2011 September 2011;26(3):162-72. X-3
1146. Murphy DGM, Beecham J, Craig M, et al. Autism in adults. New biologicial findings and their translational implications to the cost of clinical services. Brain Research. 2011;1380:22-33. X-5
1147. Murrell AR, Scherbarth AJ. State of the Research and Literature Address: ACT with Children, Adolescents and Parents. Joseph Cautilli, Ph.D. & The Behavior Analyst Online Organization. 535 Queen Street, Philadelphia, PA 19147-3220.; 2011. p. 15-22. X-4
1148. Murshid EZ. Characteristics and dental experiences of autistic children in Saudi Arabia: Cross-sectional study. Journal of Autism and Developmental Disorders. 2011;41(12):1629-34. X-5
1149. Myck-Wayne J, Robinson S, Henson E. Serving and Supporting Young Children with a Dual Diagnosis of Hearing Loss and Autism: The Stories of Four Families. American Annals of the Deaf. 2011;156(4):379-90. X-5
1150. Narendorf SC, Shattuck PT, Sterzing PR. Mental health service use among adolescents with an autism spectrum disorder. Psychiatr Serv. 2011 Aug;62(8):975-8. PMID: 21807842; X-5
1151. Nevin JA, Shahan TA. Behavioral Momentum Theory: Equations and Applications. Journal of Applied Behavior Analysis. 2011;44(4):877-95. X-5
1152. Nicholson H, Kehle TJ, Bray MA, et al. The Effects of Antecedent Physical Activity on the Academic Engagement of Children with Autism Spectrum Disorder. Psychology in the Schools. 2011;48(2):198-213. X-3
1153. Nicpon MF, Allmon A, Sieck B, et al. Empirical Investigation of Twice-Exceptionality: Where Have We Been and Where Are We Going? Gifted Child Quarterly. 2011;55(1):3-17. X-5
1154. Nielsen CMB. Towards Applied Integrationism--Integrating Autism in Teaching and Coaching Sessions. Language Sciences. 2011;33(4):593-602. X-5
1155. Normand MP, Beaulieu L. Further evaluation of response-independent delivery of preferred stimuli and child compliance. J Appl Behav Anal. 2011 Fall;44(3):665-9. PMID: 21941401; X-3
1156. Nuner JE, Griffith AC. Early Signs of Autism: How to Support Families and Navigate Referral Procedures. Dimensions of Early Childhood. 2011;39(1):12-20. X-5
1157. Obhi SS, Hogeveen J, Pascual-Leone A. Resonating with others: the effects of self-construal type on motor cortical output. J Neurosci. 2011 Oct 12;31(41):14531-5. PMID: 21994369; X-5
1158. O'Brien K, Slaughter V, Peterson CC. Sibling influences on theory of mind development for children with ASD. J Child Psychol Psychiatry. 2011 Jun;52(6):713-9. PMID: 21418062; X-5
1159. Obrusnikova I, Dillon SR. Challenging situations when teaching children with autism spectrum disorders in general physical education. Adapt Phys Activ Q. 2011 Apr;28(2):113-31. PMID: 21757784; X-5
1160. O'Connor J, Barnes-Holmes Y, Barnes-Holmes D. Establishing Contextual Control over Symmetry and Asymmetry Performances in Typically Developing Children and Children with Autism. Psychological Record. 2011;61(2):287-311. X-4
1161. O'Connor KV, Stichter JP. Using Problem-Solving Frameworks to Address Challenging Behavior of Students with High-Functioning Autism and/or Asperger Syndrome. Beyond Behavior. 2011;20(1):11-7. X-5
1162. Olivar-Parra JS, De-La-Iglesia-Gutierrez M, Forns M. Training referential communicative skills to individuals with autism spectrum disorder: a pilot study. Psychol Rep. 2011 Dec;109(3):921-39. PMID: 22420121; X-1, X-3
1163. Olmos-Serrano JL, Corbin JG, Burns MP. The GABA(A) receptor agonist THIP ameliorates specific behavioral deficits in the mouse model of fragile X syndrome. Dev Neurosci. 2011;33(5):395-403. PMID: 22067669; X-5

1164. Ono T, Araki F, Yoshiyama F. Possibility of using cylindrical ionization chambers for percent depth-dose measurements in clinical electron beams. Med Phys. 2011 Aug;38(8):4647-54. PMID: 21928637; X-5
1165. Oriel KN, George CL, Peckus R, et al. The effects of aerobic exercise on academic engagement in young children with autism spectrum disorder. Pediatr Phys Ther. 2011 Summer;23(2):187-93. PMID: 21552085; X-3
1166. Orsmond GI, Kuo HY. The daily lives of adolescents with an autism spectrum disorder: discretionary time use and activity partners. Autism. 2011 Sep;15(5):579-99. PMID: 21697194; X-5
1167. Ostryn C, Wolfe PS. Teaching preschool children with autism spectrum disorders to expressively discriminate between “what’s that?” and “where is it?”. Focus on Autism and Other Developmental Disabilities. 2011;26(4):195-205. X-3
1168. Ozsivadjian A, Knott F. Anxiety problems in young people with autism spectrum disorder: A case series. Clin Child Psychol Psychiatry. 2011;16(2):203-14. X-3
1169. Palmen A, Didden R, Korzilius H. An outpatient group training programme for improving leisure lifestyle in high-functioning young adults with ASD: a pilot study. Dev Neurorehabil. 2011;14(5):297-309. PMID: 21870954; X-5
1170. Pang KH, Croaker GD. Constipation in children with autism and autistic spectrum disorder. Pediatr Surg Int. 2011 Apr;27(4):353-8. PMID: 20697898; X-5
1171. Paparella T, Goods KS, Freeman S, et al. The Emergence of Nonverbal Joint Attention and Requesting Skills in Young Children with Autism. Journal of Communication Disorders. 2011;44(6):569-83. X-4
1172. Papas RK, Sidle JE, Gakinya BN, et al. Treatment outcomes of a stage 1 cognitive-behavioral trial to reduce alcohol use among human immunodeficiency virus-infected out-patients in western Kenya. Addiction. 2011 Dec;106(12):2156-66. PMID: 21631622; X-5
1173. Papavasiliou AS, Nikaina I, Rizou J, et al. The effect of a psycho-educational program on CARS scores and short sensory profile in autistic children. Eur J Paediatr Neurol. 2011 Jul;15(4):338-44. PMID: 21354837; X-5
1174. Parker D, Kamps D. Effects of Task Analysis and Self-Monitoring for Children with Autism in Multiple Social Settings. Focus on Autism and Other Developmental Disabilities. 2011;26(3):131-42. X-3
1175. Parker N, O'Brien P. Play Therapy-Reaching the Child with Autism. International Journal of Special Education. 2011;26(1):80-7. X-3, X-5
1176. Parry-Cruwys DE, Neal CM, Ahearn WH, et al. Resistance to Disruption in a Classroom Setting. Journal of Applied Behavior Analysis. 2011;44(2):363-7. X-3
1177. Pasco G, Tohill C. Predicting progress in Picture Exchange Communication System (PECS) use by children with autism. Int J Lang Commun Disord. 2011 Jan-Feb;46(1):120-5. PMID: 20536353; X-4
1178. Pascual-Leone A, Freitas C, Oberman L, et al. Characterizing brain cortical plasticity and network dynamics across the age-span in health and disease with TMS-EEG and TMS-fMRI. Brain Topogr. 2011 Oct;24(3-4):302-15. PMID: 21842407; X-5
1179. Patil RR. MMR vaccination and autism: learnings and implications. Hum Vaccin. 2011 Feb;7(2):281-2. PMID: 21343697; X-5
1180. Patten E, Watson LR. Interventions targeting attention in young children with autism. Am J Speech Lang Pathol. 2011 Feb;20(1):60-9. PMID: 20739632; X-1, X-2, X-3, X-4
1181. Patterson SY, Smith V. The Experience of Parents of Toddlers Diagnosed with Autism Spectrum Disorder in the More than Words Parent Education Program. Infants and Young Children. 2011;24(4):329-43. X-4, X-5
1182. Pennington L, Pennington B. Understanding Asperger's through Cinematherapy: Part I--"Parenthood". Parenting for High Potential. 2011;1(1):14-7. X-5
1183. Pennington RC, Ault MJ, Schuster JW, et al. Using Simultaneous Prompting and Computer-Assisted Instruction to Teach Story Writing to Students with Autism. Assistive Technology Outcomes and Benefits. 2011;7(1):24-38. X-3
1184. Peters B, Forlin C. Informing Educational Decisions in the Early Years: Can Evidence for Improving Pedagogy for Children with Autistic Spectrum Disorder Be Found from Neuroscience? : Wiley-Blackwell. 350 Main Street, Malden, MA 02148.; 2011. p. 135-42. X-2, X-4
1185. Peters-Scheffer N, Didden R, Korzilius H, et al. A Meta-Analytic Study on the Effectiveness of Comprehensive ABA-Based Early Intervention Programs for Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2011;5(1):60-9. X-5
1186. Petursdottir AI, Carr JE. A Review of Recommendations for Sequencing Receptive and Expressive Language Instruction. Journal of Applied Behavior Analysis. 2011;44(4):859-76. X-5
1187. Pfeiffer BA, Koenig K, Kinnealey M, et al. Effectiveness of sensory integration interventions in children with autism spectrum disorders: a pilot study. Am J Occup Ther. 2011 Jan-Feb;65(1):76-85. PMID: 21309374; X-5

1188. Pillay M, Alderson-Day B, Wright B, et al. Autism Spectrum Conditions--enhancing Nurture and Development (ASCEND): an evaluation of intervention support groups for parents. Clin Child Psychol Psychiatry. 2011 Jan;16(1):5-20. PMID: 20223793; X-5
1189. Pituch KA, Green VA, Didden R, et al. Parent reported treatment priorities for children with autism spectrum disorders. Research in Autism Spectrum Disorders. 2011;5(1):135-43. X-5
1190. Plavnick JB, Ferreri SJ. Establishing verbal repertoires in children with autism using function-based video modeling. J Appl Behav Anal. 2011 Winter;44(4):747-66. PMID: 22219527; X-3
1191. Poon KK. The activities and participation of adolescents with autism spectrum disorders in Singapore: findings from an ICF-based instrument. J Intellect Disabil Res. 2011 Aug;55(8):790-800. PMID: 21375640; X-5
1192. Powell SG, Thomsen PH, Frydenberg M, et al. Long-term treatment of ADHD with stimulants: a large observational study of real-life patients. J Atten Disord. 2011 Aug;15(6):439-51. PMID: 20631198; X-5
1193. Prelock PA, Calhoun J, Morris H, et al. Supporting Parents to Facilitate Communication and Joint Attention in Their Young Children with Autism Spectrum Disorders: Two Pilot Studies. Topics in Language Disorders. 2011;31(3):210-34. X-3
1194. Puleo CM, Kendall PC. Anxiety disorders in typically developing youth: autism spectrum symptoms as a predictor of cognitive-behavioral treatment. J Autism Dev Disord. 2011 Mar;41(3):275-86. PMID: 20694508; X-5
1195. Quigley SP, Peterson L, Frieder JE, et al. Effects of a Weighted Vest on Problem Behaviors during Functional Analyses in Children with Pervasive Developmental Disorders. Research in Autism Spectrum Disorders. 2011;5(1):529-38. X-3, X-4
1196. Raglio A, Traficante D, Oasi O. Autism and music therapy. Intersubjective approach and music therapy assessment. Nordisk tidskrift for musikkterapi - Nordic Journal of Music Therapy. 2011;20(2):123-41. X-5
1197. Rahman M, Ferdous MS, Ahmed SI, et al. Speech Development of Autistic Children by Interactive Computer Games. Interactive Technology and Smart Education. 2011;8(4):208-23. X-5
1198. Ramdoss S, Lang R, Mulloy A, et al. Use of Computer-Based Interventions to Teach Communication Skills to Children with Autism Spectrum Disorders: A Systematic Review. Springer. 233 Spring Street, New York, NY 10013.; 2011. p. 55-76. X-4
1199. Ramdoss S, Mulloy A, Lang R, et al. Use of Computer-Based Interventions to Improve Literacy Skills in Students with Autism Spectrum Disorders: A Systematic Review. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2011. p. 1306-18. X-4
1200. Randolph JK, Stichter JP, Schmidt CT, et al. Fidelity and Effectiveness of PRT Implemented by Caregivers without College Degrees. Focus on Autism and Other Developmental Disabilities. 2011;26(4):230-8. X-3
1201. Rasovska H, Rektorova I. Instrumental activities of daily living in Parkinson's disease dementia as compared with Alzheimer's disease: relationship to motor disability and cognitive deficits: a pilot study. J Neurol Sci. 2011 Nov 15;310(1-2):279-82. PMID: 21851954; X-5
1202. Ray-Subramanian CE, Huai N, Ellis Weismer S. Brief report: adaptive behavior and cognitive skills for toddlers on the autism spectrum. J Autism Dev Disord. 2011 May;41(5):679-84. PMID: 20697794; X-5
1203. Reaven J. The treatment of anxiety symptoms in youth with high-functioning autism spectrum disorders: developmental considerations for parents. Brain Res. 2011 Mar 22;1380:255-63. PMID: 20875799; X-5
1204. Reed P, Clark C. Impact of intervening learning on resurgence in humans with autism spectrum disorders. Learning & Behavior. 2011;39(2):163-70. X-5
1205. Reed P, Staytom L, Stott S, et al. Comparison of conditioning impairments in children with Down syndrome, autistic spectrum disorders and mental age-matched controls. J Intellect Disabil Res. 2011 Oct;55(10):988-97. PMID: 21790825; X-1, X-3, X-4
1206. Rehfeldt RA. Toward a technology of derived stimulus relations: An analysis of articles published in the Journal of Applied Behavior Analysis, 1992-2009. Journal of Applied Behavior Analysis. 2011;44(1):109-19. X-5
1207. Reichow B, Wolery M. Comparison of progressive prompt delay with and without instructive feedback. J Appl Behav Anal. 2011 Summer;44(2):327-40. PMID: 21709788; X-3
1208. Reilly C, Ballantine R. Epilepsy in School-Aged Children: More than Just Seizures? Support for Learning. 2011;26(4):144-51. X-2, X-5
1209. Reith RM, Way S, McKenna J, 3rd, et al. Loss of the tuberous sclerosis complex protein tuberin causes Purkinje cell degeneration. Neurobiol Dis. 2011 Jul;43(1):113-22. PMID: 21419848; X-5
1210. Renshaw TL, Kuriakose S. Pivotal Response Treatment for Children with Autism: Core Principles and Applications for School Psychologists. Journal of Applied School Psychology. 2011;27(2):181-200. X-5
1211. Reynhout G, Carter M. Social Stories[TM]: A Possible Theoretical Rationale. European Journal of Special Needs Education. 2011 2011;26(3):367-78. X-5

1212. Reynhout G, Carter M. Evaluation of the Efficacy of Social Stories[TM] Using Three Single Subject Metrics. Research in Autism Spectrum Disorders. 2011 2011;5(2):885-900. X-4
1213. Reynolds KE. Autism spectrum disorders in childhood: a clinical update. Community Pract. 2011 Jul;84(7):36-8. PMID: 21941709; X-5
1214. Reynolds S, Bendixen RM, Lawrence T, et al. A pilot study examining activity participation, sensory responsiveness, and competence in children with high functioning autism spectrum disorder. Journal of Autism and Developmental Disorders. 2011;41(11):1496-506. X-5
1215. Richling SM, Rapp JT, Carroll RA, et al. Using noncontingent reinforcement to increase compliance with wearing prescription prostheses. J Appl Behav Anal. 2011 Summer;44(2):375-9. PMID: 21709796; X-3, X-5
1216. Ridge K, Guerin S. Irish clinicians' views of interventions for children with autistic spectrum disorders. Autism. 2011 Mar;15(2):239-52. PMID: 21325370; X-5
1217. Riojas-Cortez M. Culture, Play, and Family: Supporting Children on the Autism Spectrum. Young Children. 2011;66(5):94-9. X-5
1218. Rispoli M, O'Reilly M, Lang R, et al. Effects of Motivating Operations on Problem and Academic Behavior in Classrooms. Journal of Applied Behavior Analysis. 2011;44(1):187-92. X-3
1219. Riviere V, Becquet M, Peltret E, et al. Increasing Compliance with Medical Examination Requests Directed to Children with Autism: Effects of a High-Probability Request Procedure. Journal of Applied Behavior Analysis. 2011;44(1):193-7. X-3
1220. Roberts RM, Moar K, Scott R. Teachers' Opinions of Interdisciplinary Reports: The Children's Assessment Team. Australian Journal of Educational & Developmental Psychology. 2011;11:39-59. X-5
1221. Roberts TP, Cannon KM, Tavabi K, et al. Auditory magnetic mismatch field latency: a biomarker for language impairment in autism. Biol Psychiatry. 2011 Aug 1;70(3):263-9. PMID: 21392733; X-5
1222. Rolinski M, Ebmeier KP. Tackling dementia in patients with Parkinson's disease. Practitioner. 2011 Jan;255(1736):15-7, 2. PMID: 21370709; X-5
1223. Rosenblatt LE, Gorantla S, Torres JA, et al. Relaxation response-based yoga improves functioning in young children with autism: a pilot study. J Altern Complement Med. 2011 Nov;17(11):1029-35. PMID: 21992466; X-5
1224. Ross LA, Molholm S, Blanco D, et al. The development of multisensory speech perception continues into the late childhood years. Eur J Neurosci. 2011 Jun;33(12):2329-37. PMID: 21615556; X-5
1225. Rossignol DA, Frye RE. Melatonin in Autism Spectrum Disorders: A Systematic Review and Meta-Analysis. Developmental Medicine & Child Neurology. 2011;53(9):783-92. X-5
1226. Rotheram-Fuller E, MacMullen L. Cognitive-Behavioral Therapy for Children with Autism Spectrum Disorders. Psychology in the Schools. 2011;48(3):263-71. X-2, X-5
1227. Rothman SM. Health advocacy organizations and evidence-based medicine. JAMA. 2011 Jun 22;305(24):2569-70. PMID: 21693747; X-5
1228. Ryan JB, Hughes EM, Katsiyannis A, et al. Research-Based Educational Practices for Students with Autism Spectrum Disorders. TEACHING Exceptional Children. 2011;43(3):56-64. X-5
1229. Ryndak DL, Orlando A-M, Storch JF, et al. A Mother's Perceptions of Her Ongoing Advocacy Efforts for Her Son with Significant Disabilities: Her Twelve-Year Journey. International Journal of Whole Schooling. 2011;7(2):74-91. X-5
1230. Saalasti S, Tiippana K, Katsyri J, et al. The effect of visual spatial attention on audiovisual speech perception in adults with Asperger syndrome. Exp Brain Res. 2011 Sep;213(2-3):283-90. PMID: 21660467; X-5
1231. Samson F, Hyde KL, Bertone A, et al. Atypical processing of auditory temporal complexity in autistics. Neuropsychologia. 2011 Feb;49(3):546-55. PMID: 21192958; X-5
1232. Samyn V, Roeyers H, Bijttebier P. Effortful control in typically developing boys and in boys with ADHD or autism spectrum disorder. Res Dev Disabil. 2011 Mar-Apr;32(2):483-90. PMID: 21255973; X-5
1233. Sansa G, Carlson C, Doyle W, et al. Medically refractory epilepsy in autism. Epilepsia. 2011 Jun;52(6):1071-5. PMID: 21671922; X-1, X-3, X-4
1234. Sarrett JC, Kushner HI. A Case for Preserving the Diversity of Madness. Annals of Science. 2011;68(4):547-54. X-5
1235. Sayers N, Oliver C, Ruddick L, et al. Stereotyped Behaviour in Children with Autism and Intellectual Disability: An Examination of the Executive Dysfunction Hypothesis. Journal of Intellectual Disability Research. 2011;55(7):699-709. X-3, X-5
1236. Schaaf RC, Toth-Cohen S, Johnson SL, et al. The everyday routines of families of children with autism: examining the impact of sensory processing difficulties on the family. Autism. 2011 May;15(3):373-89. PMID: 21430016; X-5

1237. Schertz HH, Baker C, Hurwitz S, et al. Principles of Early Intervention Reflected in Toddler Research in Autism Spectrum Disorders. Topics in Early Childhood Special Education. 2011;31(1):4-21. X-5
1238. Schieve LA, Rice C, Devine O, et al. Have secular changes in perinatal risk factors contributed to the recent autism prevalence increase? Development and application of a mathematical assessment model. Ann Epidemiol. 2011 Dec;21(12):930-45. PMID: 22000328; X-5
1239. Schiff A, Tarbox J, Lanagan T, et al. Establishing Compliance with Liquid Medication Administration in a Child with Autism. Journal of Applied Behavior Analysis. 2011;44(2):381-5. X-3
1240. Schleismann KD, Gillis JM. The Treatment of Social Phobia in a Young Boy with Asperger's Disorder. Cognitive and Behavioral Practice. 2011;18(4):515-29. X-3
1241. Schlenker B, Gratzke C, Seitz M, et al. Fluorescence-guided laser therapy for penile carcinoma and precancerous lesions: long-term follow-up. Urol Oncol. 2011 Nov-Dec;29(6):788-93. PMID: 19945305; X-5
1242. Schlosser RW, Shane H, Sorce J, et al. Identifying performing and under performing graphic symbols for verbs and prepositions in animated and static formats: a research note. Augment Altern Commun. 2011 Sep;27(3):205-14. PMID: 22008033; X-5
1243. Schmid AM, Truog AW, Damian FJ. Care of the suicidal pediatric patient in the ED: a case study. Am J Nurs. 2011 Sep;111(9):34-43; quiz 4-5. PMID: 21865931; X-5
1244. Schneider HD, Hopp JP. The use of the Bilingual Aphasia Test for assessment and transcranial direct current stimulation to modulate language acquisition in minimally verbal children with autism. Clin Linguist Phon. 2011 Jun;25(6-7):640-54. PMID: 21631313; X-1, X-3
1245. Schoen E, Paul R, Chawarska K. Phonology and vocal behavior in toddlers with autism spectrum disorders. Autism Res. 2011 Jun;4(3):177-88. PMID: 21308998; X-5
1246. Schon T, Sandelin LL, Bonnedahl J, et al. A comparative study of three methods to evaluate an intervention to improve empirical antibiotic therapy for acute bacterial infections in hospitalized patients. Scand J Infect Dis. 2011 Apr;43(4):251-7. PMID: 21171827; X-5
1247. Schultz TR, Schmidt CT, Stichter JP. A Review of Parent Education Programs for Parents of Children with Autism Spectrum Disorders. Focus on Autism and Other Developmental Disabilities. 2011;26(2):96-104. X-2, X-3, X-4
1248. Schumacher BI, Rapp JT. Evaluation of the immediate and subsequent effects of response interruption and redirection on vocal stereotypy. J Appl Behav Anal. 2011 Fall;44(3):681-5. PMID: 21941405; X-3
1249. Seiverling L, Hendy HM, Williams K. The Screening Tool of Feeding Problems applied to children (STEP-CHILD): psychometric characteristics and associations with child and parent variables. Res Dev Disabil. 2011 May-Jun;32(3):1122-9. PMID: 21316919; X-5
1250. Semansky RM, Xie M, Mandell DS. Medicaid's increasing role in treating youths with autism spectrum disorders. Psychiatr Serv. 2011 Jun;62(6):588. PMID: 21632723; X-5
1251. Serpentine EC, Tarnai B, Drager KD, et al. Decision Making of Parents of Children with Autism Spectrum Disorder Concerning Augmentative and Alternative Communication in Hungary. Communication Disorders Quarterly. 2011;32(4):221-31. X-4
1252. Sharp WG, Jaquess DL, Morton JF, et al. A retrospective chart review of dietary diversity and feeding behavior of children with autism spectrum disorder before and after admission to a day-treatment program. Focus on Autism and Other Developmental Disabilities. 2011;26(1):37-48. X-5
1253. Shattuck PT, Wagner M, Narendorf S, et al. Post-high school service use among young adults with an autism spectrum disorder. Arch Pediatr Adolesc Med. 2011 Feb;165(2):141-6. PMID: 21300654; X-5
1254. Shillingsburg MA, Valentino AL. Teaching a child with autism to mand for information using "how.". Analysis of Verbal Behavior. 2011;27:179-84. X-3
1255. Shogren KA, Lang R, Machalicek W, et al. Self-versus teacher management of behavior for elementary school students with asperger syndrome: Impact on classroom behavior. Journal of Positive Behavior Interventions. 2011;13(2):87-96. X-3
1256. Silva K, Correia R, Lima M, et al. Can dogs prime autistic children for therapy? Evidence from a single case study. The Journal of Alternative and Complementary Medicine. 2011;17(7):655-9. X-3
1257. Silva LM, Schalock M, Ayres R. A model and treatment for autism at the convergence of Chinese medicine and Western science: first 130 cases. Chin J Integr Med. 2011 Jun;17(6):421-9. PMID: 21660676; X-2, X-3
1258. Silva LM, Schalock M, Gabrielsen K. Early intervention for autism with a parent-delivered Qigong massage program: a randomized controlled trial. Am J Occup Ther. 2011 Sep-Oct;65(5):550-9. PMID: 22026323; X-5
1259. Simpson K, Keen D. Music Interventions for Children with Autism: Narrative Review of the Literature. Springer. 233 Spring Street, New York, NY 10013.; 2011. p. 1507-14. X-2, X-4

1260. Singh NN, Lancioni GE, Manikam R, et al. A mindfulness-based strategy for self-management of aggressive behavior in adolescents with autism. Research in Autism Spectrum Disorders. 2011;5(3):1153-8. X-5
1261. Siu AM, Lai CY, Chiu AS, et al. Development and Validation of a Fine-Motor Assessment Tool for Use with Young Children in a Chinese Population. Research in Developmental Disabilities: A Multidisciplinary Journal. 2011;32(1):107-14. X-5
1262. Smith T, Eikeseth S. O. Ivar Lovaas: Pioneer of Applied Behavior Analysis and Intervention for Children with Autism. Journal of Autism and Developmental Disorders. 2011;41(3):375-8. X-5
1263. Sofronoff K, Dark E, Stone V. Social vulnerability and bullying in children with Asperger syndrome. Autism. 2011 May;15(3):355-72. PMID: 21430018; X-5
1264. Southall CM, Gast DL. Self-Management Procedures: A Comparison across the Autism Spectrum. Education and Training in Autism and Developmental Disabilities. 2011;46(2):155-71. X-2, X-3, X-4
1265. Sowden H, Perkins M, Clegg J. Context and Communication Strategies in Naturalistic Behavioural Intervention: A Framework for Understanding How Practitioners Facilitate Communication in Children with ASD. Child Language Teaching and Therapy. 2011 February 2011;27(1):21-38. X-3, X-5
1266. Specchio N, Fusco L, Claps D, et al. Childhood refractory focal epilepsy following acute febrile encephalopathy. Eur J Neurol. 2011 Jul;18(7):952-61. PMID: 21087361; X-5
1267. Spector JE. Sight word instruction for students with autism: an evaluation of the evidence base. J Autism Dev Disord. 2011 Oct;41(10):1411-22. PMID: 21184159; X-2, X-3
1268. Speight RJ, Esmail A, Weston SJ. Quality assurance of electron and photon beam energy using the BQ-CHECK phantom. J Appl Clin Med Phys. 2011;12(2):3366. PMID: 21587183; X-5
1269. Spencer L, Lyketsos CG, Samstad E, et al. A suicidal adult in crisis: an unexpected diagnosis of autism spectrum disorder. Am J Psychiatry. 2011 Sep;168(9):890-2. PMID: 21890803; X-5
1270. Stahmer AC, Akshoomoff N, Cunningham AB. Inclusion for toddlers with autism spectrum disorders: the first ten years of a community program. Autism. 2011 Sep;15(5):625-41. PMID: 21486899; X-5
1271. Stahmer AC, Brookman-Frazee L, Lee E, et al. Parent and Multidisciplinary Provider Perspectives on Earliest Intervention for Children at Risk for Autism Spectrum Disorders. Infants and Young Children. 2011;24(4):344-63. X-5
1272. Star K, Caster O, Bate A, et al. Dose variations associated with formulations of NSAID prescriptions for children: a descriptive analysis of electronic health records in the UK. Drug Saf. 2011 Apr 1;34(4):307-17. PMID: 21417503; X-5
1273. Stein LI, Polido JC, Mailloux Z, et al. Oral care and sensory sensitivities in children with autism spectrum disorders. Spec Care Dentist. 2011 May-Jun;31(3):102-10. PMID: 21592164; X-5
1274. Steiner AM. A Strength-Based Approach to Parent Education for Children with Autism. Journal of Positive Behavior Interventions. 2011;13(3):178-90. X-3, X-4
1275. Stevens C, Sidener TM, Reeve SA, et al. Effects of behavior-specific and general praise, on acquisition of tacts in children with pervasive developmental disorders. Research in Autism Spectrum Disorders. 2011;5(1):666-9. X-3
1276. Stevenson RA, VanDerKlok RM, Pisoni DB, et al. Discrete neural substrates underlie complementary audiovisual speech integration processes. Neuroimage. 2011 Apr 1;55(3):1339-45. PMID: 21195198; X-5
1277. Stocco CS, Thompson RH, Rodriguez NM. Restricted Interests and Teacher Presentation of Items. Journal of Applied Behavior Analysis. 2011;44(3):499-512. X-5
1278. Strain PS, Schwartz IS, Barton EE. Providing Interventions for Young Children with Autism Spectrum Disorders: What We Still Need to Accomplish. Journal of Early Intervention. 2011;33(4):321-32. X-5
1279. Strehle EM. Dysmorphological and pharmacological studies in 4q- syndrome. Genet Couns. 2011;22(2):173-85. PMID: 21848010; X-5
1280. Stringfield SG, Luscre D, Gast DL. Effects of a Story Map on Accelerated Reader Postreading Test Scores in Students with High-Functioning Autism. Focus on Autism and Other Developmental Disabilities. 2011;26(4):218-29. X-3
1281. Styles A. Social Stories[TM]: Does the Research Evidence Support the Popularity? : Routledge. , 325 Chestnut Street Suite 800, Philadelphia, PA 19106.; 2011. p. 415-36. X-4
1282. Suda M, Takei Y, Aoyama Y, et al. Autistic traits and brain activation during face-to-face conversations in typically developed adults. PLoS One. 2011;6(5). X-5
1283. Sumiyoshi C, Kawakubo Y, Suga M, et al. Impaired ability to organize information in individuals with autism spectrum disorders and their siblings. Neurosci Res. 2011 Mar;69(3):252-7. PMID: 21129422; X-5
1284. Sundberg ML, Sundberg CA. Intraverbal Behavior and Verbal Conditional Discriminations in Typically Developing Children and Children with Autism. Analysis of Verbal Behavior. 2011;27:23-43. X-5

1285. Suzuki M. Mental development and autistic behavior in children with pervasive developmental disorders. Research in Autism Spectrum Disorders. 2011;5(4):1517-25. X-5
1286. Taft RJ, Mason LH. Examining Effects of Writing Interventions: Highlighting Results for Students with Primary Disabilities Other than Learning Disabilities. SAGE Publications and Hammill Institute on Disabilities. 2455 Teller Road, Thousand Oaks, CA 91320.; 2011. p. 359-70. X-2
1287. Tamanaha AC, Perissinoto J. Comparison of the evolutional process of children with autism spectrum disorders in different language therapeutic interventions. J Soc Bras Fonoaudiol. 2011 Mar;23(1):8-12. PMID: 21552726; X-5
1288. Tarnai B. Establishing the Relative Importance of Applying Gray's Sentence Ratio as a Component in a 10-Step Social Stories Intervention Model for Students with ASD. International Journal of Special Education. 2011;26(3):58-79. X-3
1289. Tekin İftar E, Kurt O, Çetin Ö. A comparison of constant time delay instruction with high and low treatment integrity. Kuram ve Uygulamada Eğitim Bilimleri. 2011;11(1):375-81. X-3
1290. Thomas M, Hunt A, Hurley M, et al. Time-use diaries are acceptable to parents with a disabled preschool child and are helpful in understanding families' daily lives. Child Care Health Dev. 2011 Mar;37(2):168-74. PMID: 20854450; X-5
1291. Thomeer ML, Rodgers JD, Lopata C, et al. Open-Trial Pilot of "Mind Reading" and in Vivo Rehearsal for Children with HFASD. Focus on Autism and Other Developmental Disabilities. 2011;26(3):153-61. X-5
1292. Thompson AL. Case in Point: Illuminations for the Future of Special Education Leadership. Journal of Special Education Leadership. 2011;24(2):111-3. X-5
1293. Thompson CJ. Multi-Sensory Intervention Observational Research. International Journal of Special Education. 2011;26(1):202-14. X-3, X-4
1294. Thompson MJ, McLaughlin TF, Derby KM. The use of differential reinforcement to decrease inappropriate verbalizations of a nine-year-old girl with autism. Electronic Journal of Research in Educational Psychology. 2011;9(1):183-96. X-3
1295. Tiinanen S, Maatta A, Silfverhuth M, et al. HRV and EEG based indicators of stress in children with Asperger syndrome in audio-visual stimulus test. Conf Proc IEEE Eng Med Biol Soc. 2011;2011:2021-4. PMID: 22254732; X-5
1296. Tincani M, Devis K. Quantitative Synthesis and Component Analysis of Single-Participant Studies on the Picture Exchange Communication System. Remedial and Special Education. 2011;32(6):458-70. X-5
1297. Tobiasova Z, van der Lingen KH, Scahill L, et al. Risperidone-related improvement of irritability in children with autism is not associated with changes in serum of epidermal growth factor and interleukin-13. J Child Adolesc Psychopharmacol. 2011 Dec;21(6):555-64. PMID: 22070180; X-4
1298. Trasande L, Liu Y. Reducing the staggering costs of environmental disease in children, estimated at $76.6 billion in 2008. Health Aff (Millwood). 2011 May;30(5):863-70. PMID: 21543421; X-5
1299. Trepagnier CY, Olsen DE, Boteler L, et al. Virtual conversation partner for adults with autism. Cyberpsychol Behav Soc Netw. 2011 Jan-Feb;14(1-2):21-7. PMID: 21329439; X-5
1300. Trottier N, Kamp L, Mirenda P. Effects of peer-mediated instruction to teach use of speech-generating devices to students with autism in social game routines. Augment Altern Commun. 2011 Mar;27(1):26-39. PMID: 21284561; X-3
1301. Tsakanikos E, Underwood L, Kravariti E, et al. Gender Differences in Co-Morbid Psychopathology and Clinical Management in Adults with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2011;5(2):803-8. X-5
1302. Turnbull A, Turnbull R. Right Science and Right Results: Lifestyle Change, PBS, and Human Dignity. Journal of Positive Behavior Interventions. 2011;13(2):69-77. X-5
1303. Turner-Brown LM, Lam KS, Holtzclaw TN, et al. Phenomenology and measurement of circumscribed interests in autism spectrum disorders. Autism. 2011 Jul;15(4):437-56. PMID: 21454386; X-5
1304. Tyler CV, Schramm SC, Karafa M, et al. Chronic disease risks in young adults with autism spectrum disorder: Forewarned is forearmed. American Journal on Intellectual and Developmental Disabilities. 2011;116(5):371-80. X-5
1305. Umeda C, Deitz J. Effects of therapy cushions on classroom behaviors of children with autism spectrum disorder. Am J Occup Ther. 2011 Mar-Apr;65(2):152-9. PMID: 21476362; X-3
1306. Vaccarino FM, Urban AE, Stevens HE, et al. Annual Research Review: The Promise of Stem Cell Research for Neuropsychiatric Disorders. Journal of Child Psychology and Psychiatry. 2011;52(4):504-16. X-5

1307. Vaidya CJ, Foss-Feig J, Shook D, et al. Controlling attention to gaze and arrows in childhood: an fMRI study of typical development and Autism Spectrum Disorders. Dev Sci. 2011 Jul;14(4):911-24. PMID: 21676110; X-4, X-5
1308. Valentino AL, Shillingsburg MA, Call NA, et al. An investigation of extinction-induced vocalizations. Behavior Modification. 2011;35(3):284-98. X-3
1309. Van Adel JM, Geier JD, Perry A, et al. Credible knowledge: a pilot evaluation of a modified GRADE method using parent-implemented interventions for children with autism. BMC Health Serv Res. 2011;11:60. PMID: 21426564; X-1, X-2, X-3, X-5
1310. van Steensel FJ, Bogels SM, Perrin S. Anxiety disorders in children and adolescents with autistic spectrum disorders: a meta-analysis. Clin Child Fam Psychol Rev. 2011 Sep;14(3):302-17. PMID: 21735077; X-5
1311. Vanvuchelen M, Vochten C. How much change is true change? The smallest detectable difference of the Preschool Imitation and Praxis Scale (PIPS) in preschoolers with intellectual disabilities of heterogeneous aetiology. Res Dev Disabil. 2011 Jan-Feb;32(1):180-7. PMID: 20952157; X-3, X-5
1312. Virues-Ortega J, Segui-Duran D, Descalzo-Quero A, et al. Caregivers' agreement and validity of indirect functional analysis: A cross cultural evaluation across multiple problem behavior topographies. Journal of Autism and Developmental Disorders. 2011;41(1):82-91. X-5
1313. Volkert VM, Vaz PC, Piazza CC, et al. Using a Flipped Spoon to Decrease Packing in Children with Feeding Disorders. Journal of Applied Behavior Analysis. 2011;44(3):617-21. X-3
1314. Vollmer TR. Three Variations of Translational Research: Comments on Critchfield (2011). Behavior Analyst. 2011;34(1):31-5. X-5
1315. von der Embse N, Brown A, Fortain J. Facilitating Inclusion by Reducing Problem Behaviors for Students with Autism Spectrum Disorders. SAGE Publications and Hammill Institute on Disabilities. 2455 Teller Road, Thousand Oaks, CA 91320.; 2011. p. 22-30. X-4
1316. Vriend JL, Corkum PV, Moon EC, et al. Behavioral interventions for sleep problems in children with autism spectrum disorders: current findings and future directions. J Pediatr Psychol. 2011 Oct;36(9):1017-29. PMID: 21745808; X-5
1317. Wachtel LE, Dhossche DM, Kellner CH. When is electroconvulsive therapy appropriate for children and adolescents? Med Hypotheses. 2011 Mar;76(3):395-9. PMID: 21129852; X-5
1318. Wainer AL, Ingersoll BR. The Use of Innovative Computer Technology for Teaching Social Communication to Individuals with Autism Spectrum Disorders. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2011. p. 96-107. X-2, X-4
1319. Wan CY, Bazen L, Baars R, et al. Auditory-motor mapping training as an intervention to facilitate speech output in non-verbal children with autism: a proof of concept study. PLoS One. 2011;6(9):e25505. PMID: 21980480; X-3, X-4
1320. Wang H-T, Sandall SR, Davis CA, et al. Social Skills Assessment in Young Children with Autism: A Comparison Evaluation of the SSRS and PKBS. Journal of Autism and Developmental Disorders. 2011;41(11):1487-95. X-5
1321. Wang S-Y, Cui Y, Parrila R. Examining the Effectiveness of Peer-Mediated and Video-Modeling Social Skills Interventions for Children with Autism Spectrum Disorders: A Meta-Analysis in Single-Case Research Using HLM. Research in Autism Spectrum Disorders. 2011;5(1):562-9. X-5
1322. Webber LS, McVilly KR, Chan J. Restrictive interventions for people with a disability exhibiting challenging behaviours: Analysis of a population database. Journal of Applied Research in Intellectual Disabilities. 2011;24(6):495-507. X-1, X-3, X-4
1323. Weeden M, Poling A. Identifying Reinforcers in Skill Acquisition Studies Involving Participants with Autism: Procedures Reported from 2005 to 2009. Research in Autism Spectrum Disorders. 2011;5(1):388-91. X-2, X-5
1324. Weeden M, Porter LK, Durgin A, et al. Reporting of medication information in applied studies of people with autism. Research in Autism Spectrum Disorders. 2011;5(1):108-11. X-2, X-5
1325. Weinkauf SM, Zeug NM, Anderson CT, et al. Evaluating the effectiveness of a comprehensive staff training package for behavioral interventions for children with autism. Research in Autism Spectrum Disorders. 2011;5(2):864-71. X-5
1326. Weintraub D, Somogyi M, Meng X. Rivastigmine in Alzheimer's disease and Parkinson's disease dementia: an ADAS-cog factor analysis. Am J Alzheimers Dis Other Demen. 2011 Sep;26(6):443-9. PMID: 22009228; X-5
1327. Werner S. Assessing female students' attitudes in various health and social professions toward working with people with autism: A preliminary study. Journal of Interprofessional Care. 2011;25(2):131-7. X-5

1328. Westendorp M, Houwen S, Hartman E, et al. Are gross motor skills and sports participation related in children with intellectual disabilities? Res Dev Disabil. 2011 May-Jun;32(3):1147-53. PMID: 21310587; X-5
1329. Wharff EA, Ginnis KB, Ross AM, et al. Predictors of psychiatric boarding in the pediatric emergency department: implications for emergency care. Pediatr Emerg Care. 2011 Jun;27(6):483-9. PMID: 21629148; X-5
1330. White P, O'Reilly M, Fragale C, et al. An Extended Functional Analysis Protocol Assesses the Role of Stereotypy in Aggression in Two Young Children with Autism Spectrum Disorder. Research in Autism Spectrum Disorders. 2011;5(2):784-9. X-3, X-5
1331. White PJ, O'Reilly M, Streusand W, et al. Best Practices for Teaching Joint Attention: A Systematic Review of the Intervention Literature. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2011. p. 1283-95. X-4
1332. Whitehouse AJ, Maybery M, Wray JA, et al. No association between early gastrointestinal problems and autistic-like traits in the general population. Dev Med Child Neurol. 2011 May;53(5):457-62. PMID: 21418197; X-5
1333. Willette AA, Lubach GR, Knickmeyer RC, et al. Brain enlargement and increased behavioral and cytokine reactivity in infant monkeys following acute prenatal endotoxemia. Behav Brain Res. 2011 May 16;219(1):108-15. PMID: 21192986; X-1, X-3, X-4, X-5
1334. Woodard CR, Van Reet J. Object identification and imagination: an alternative to the meta-representational explanation of autism. J Autism Dev Disord. 2011 Feb;41(2):213-26. PMID: 20532603; X-2, X-5
1335. Woods JJ, Brown JA. Integrating Family Capacity-Building and Child Outcomes to Support Social Communication Development in Young Children with Autism Spectrum Disorder. Topics in Language Disorders. 2011;31(3):235-46. X-5
1336. Woolfson LM, Taylor RJ, Mooney L. Parental attributions of controllability as a moderator of the relationship between developmental disability and behaviour problems. Child Care Health Dev. 2011 Mar;37(2):184-94. PMID: 20533916; X-5
1337. Worley JA, Matson JL, Sipes M, et al. Prevalence of Autism Spectrum Disorders in Toddlers Receiving Early Intervention Services. Research in Autism Spectrum Disorders. 2011;5(2):920-5. X-5
1338. Wright B, Sims D, Smart S, et al. Melatonin versus placebo in children with autism spectrum conditions and severe sleep problems not amenable to behaviour management strategies: a randomised controlled crossover trial. J Autism Dev Disord. 2011 Feb;41(2):175-84. PMID: 20535539; X-5
1339. Wright C, Conlon E, Wright M, et al. Sub-Lexical Reading Intervention in a Student with Dyslexia and Asperger's Disorder. Australian Journal of Educational & Developmental Psychology. 2011;11:11-25. X-3
1340. Xia RR. Effectiveness of nutritional supplements for reducing symptoms in autism-spectrum disorder: A case report. The Journal of Alternative and Complementary Medicine. 2011;17(3):271-4. X-3
1341. Xin JF, Sutman FX. Using the Smart Board in Teaching Social Stories to Students with Autism. TEACHING Exceptional Children. 2011;43(4):18-24. X-1, X-2, X-3, X-4
1342. Yang M, Perry K, Weber MD, et al. Social peers rescue autism-relevant sociability deficits in adolescent mice. Autism Res. 2011 Feb;4(1):17-27. PMID: 20928844; X-5
1343. Yaw JS, Skinner CH, Parkhurst J, et al. Extending Research on a Computer-Based Sight-Word Reading Intervention to a Student with Autism. Journal of Behavioral Education. 2011;20(1):44-54. X-3
1344. Youmans G, Youmans SR, Hancock AB. Script Training Treatment for Adults with Apraxia of Speech. American Journal of Speech-Language Pathology. 2011;20(1):23-37. X-5
1345. Young D, Bebbington A, de Klerk N, et al. The relationship between MECP2 mutation type and health status and service use trajectories over time in a rett syndrome population. Research in Autism Spectrum Disorders. 2011;5(1):442-9. X-5
1346. Zachor DA, Ben Itzchak E. Assisted reproductive technology and risk for autism spectrum disorder. Res Dev Disabil. 2011 Nov-Dec;32(6):2950-6. PMID: 21658904; X-5
1347. Zeiner P, Gjevik E, Weidle B. Response to atomoxetine in boys with high-functioning autism spectrum disorders and attention deficit/hyperactivity disorder. Acta Paediatrica. 2011;100(9):1258-61. X-1, X-3
1348. Zeman LD, Swanke J, Doktor J. Strengths Classification of Social Relationships among Cybermothers Raising Children with Autism Spectrum Disorders. School Community Journal. 2011;21(1):37-51. X-5
1349. Zhang J, Wheeler JJ. A Meta-Analysis of Peer-Mediated Interventions for Young Children with Autism Spectrum Disorders. Education and Training in Autism and Developmental Disabilities. 2011;46(1):62-77. X-5
1350. Zhu H, Sun Y, Zeng J, et al. Mirror neural training induced by virtual reality in brain-computer interfaces may provide a promising approach for the autism therapy. Med Hypotheses. 2011 May;76(5):646-7. PMID: 21300442; X-5
1351. Zirkel PA. Autism Litigation under the IDEA: A New Meaning of "Disproportionality"? Journal of Special Education Leadership. 2011 September 2011;24(2):92-103. X-5

1352. Trialing targeted therapies for autism. Nat Med. 2012 Dec;18(12):1746-7. PMID: 23223062; X-1, X-2, X-3, X-4
1353. Improving support for staff and patients with Asperger's syndrome. Nurs Stand. 2012 Oct 10-16;27(6):63. PMID: 23189584; X-1, X-2, X-3, X-4
1354. Abrahamse ME, Junger M, Chavannes EL, et al. Parent–child interaction therapy for preschool children with disruptive behaviour problems in the Netherlands. Child and Adolescent Psychiatry and Mental Health. 2012;6. X-3
1355. Achmadi D, Kagohara DM, van der Meer L, et al. Teaching Advanced Operation of an iPod-Based Speech-Generating Device to Two Students with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2012;6(4):1258-64. X-3, X-5
1356. Ackerman S, Reilly B, Bernier R. Tympanostomy tube placement in children with autism. J Dev Behav Pediatr. 2012 Apr;33(3):252-8. PMID: 22343482; X-4, X-5
1357. Adamo SM. The Aesthetic Experience in the Process of Recovery from Autistic States. Journal of Child Psychotherapy. 2012 2012;38(1):61-77. X-2, X-5
1358. Adams C, Lockton E, Freed J, et al. The Social Communication Intervention Project: A randomized controlled trial of the effectiveness of speech and language therapy for school-age children who have pragmatic and social communication problems with or without autism spectrum disorder. International Journal of Language & Communication Disorders. 2012;47(3):233-44. X-3
1359. Ahmad S, Aboumarzouk O, Somani B, et al. Oral 5-aminolevulinic acid in simultaneous photodynamic diagnosis of upper and lower urinary tract transitional cell carcinoma - a prospective audit. BJU Int. 2012 Dec;110(11 Pt B):E596-600. PMID: 22758907; X-5
1360. Ahmedani BK, Hock RM. Health care access and treatment for children with co-morbid autism and psychiatric conditions. Soc Psychiatry Psychiatr Epidemiol. 2012 Nov;47(11):1807-14. PMID: 22322982; X-5
1361. Alcantara JI, Cope TE, Cope W, et al. Auditory temporal-envelope processing in high-functioning children with Autism Spectrum Disorder. Neuropsychologia. 2012 Jun;50(7):1235-51. PMID: 22349444; X-5
1362. Allison J, Wilder DA, Chong I, et al. A comparison of differential reinforcement and noncontingent reinforcement to treat food selectivity in a child with autism. Journal of Applied Behavior Analysis. 2012;45(3):613-7. X-3
1363. Altenmuller E, Demorest SM, Fujioka T, et al. Introduction to The neurosciences and music IV: learning and memory. Ann N Y Acad Sci. 2012 Apr;1252:1-16. PMID: 22524334; X-5
1364. Altgassen M, Koban N, Kliegel M. Do adults with autism spectrum disorders compensate in naturalistic prospective memory tasks? Journal of Autism and Developmental Disorders. 2012;42(10):2141-51. X-5
1365. Amirsalari S, Yousefi J, Radfar S, et al. Cochlear implant outcomes in children with motor developmental delay. Int J Pediatr Otorhinolaryngol. 2012 Jan;76(1):100-3. PMID: 22100224; X-1, X-3, X-4
1366. Ansorge C, Strommer L, Andren-Sandberg A, et al. Structured intraoperative assessment of pancreatic gland characteristics in predicting complications after pancreaticoduodenectomy. Br J Surg. 2012 Aug;99(8):1076-82. PMID: 22556164; X-5
1367. Argyropoulou Z, Papoudi D. The Training of a Child with Autism in a Greek Preschool Inclusive Class through Intensive Interaction: A Case Study. European Journal of Special Needs Education. 2012;27(1):99-114. X-3
1368. Armstrong TK, Hughes MT. Exploring Computer and Storybook Interventions for Children with High Functioning Autism. International Journal of Special Education. 2012 2012;27(3):88-99. X-3
1369. Arnold LE, Aman MG, Hollway J, et al. Placebo-controlled pilot trial of mecamylamine for treatment of autism spectrum disorders. J Child Adolesc Psychopharmacol. 2012 Jun;22(3):198-205. PMID: 22537359; X-5
1370. Asaro-Saddler K, Bak N. Teaching Children with High-Functioning Autism Spectrum Disorders to Write Persuasive Essays. Topics in Language Disorders. 2012 2012;32(4):361-78. X-3
1371. Atladottir HO, Henriksen TB, Schendel DE, et al. Autism after infection, febrile episodes, and antibiotic use during pregnancy: an exploratory study. Pediatrics. 2012 Dec;130(6):e1447-54. PMID: 23147969; X-5
1372. Atzori M, Garcia-Oscos F, Mendez JA. Role of IL-6 in the etiology of hyperexcitable neuropsychiatric conditions: experimental evidence and therapeutic implications. Future Med Chem. 2012 Nov;4(17):2177-92. PMID: 23190106; X-5
1373. Audenet F, Traxer O, Yates DR, et al. Potential role of photodynamic techniques combined with new generation flexible ureterorenoscopes and molecular markers for the management of urothelial carcinoma of the upper urinary tract. BJU Int. 2012 Feb;109(4):608-13; discussion 13-4. PMID: 21985291; X-5
1374. Auert EJ, Trembath D, Arciuli J, et al. Parents' expectations, awareness, and experiences of accessing evidence-based speech-language pathology services for their children with autism. Int J Speech Lang Pathol. 2012 Apr;14(2):109-18. PMID: 22390744; X-4, X-5

1375. Babineau BA, Yang M, Crawley JN. Mainstreaming mice. Neuropsychopharmacology. 2012 Jan;37(1):300-1. PMID: 22157866; X-5
1376. Baghdadli A, Assouline B, Sonie S, et al. Developmental Trajectories of Adaptive Behaviors from Early Childhood to Adolescence in a Cohort of 152 Children with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders. 2012;42(7):1314-25. X-4
1377. Bagni C, Tassone F, Neri G, et al. Fragile X syndrome: causes, diagnosis, mechanisms, and therapeutics. J Clin Invest. 2012 Dec 3;122(12):4314-22. PMID: 23202739; X-5
1378. Bahrami F, Movahedi A, Marandi SM, et al. Kata techniques training consistently decreases stereotypy in children with autism spectrum disorder. Res Dev Disabil. 2012 Jul-Aug;33(4):1183-93. PMID: 22502844; X-5
1379. Bailey DB, Jr., Raspa M, Bishop E, et al. Medication utilization for targeted symptoms in children and adults with fragile X syndrome: US survey. J Dev Behav Pediatr. 2012 Jan;33(1):62-9. PMID: 22064563; X-5
1380. Ballan MS. Parental Perspectives of Communication about Sexuality in Families of Children with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders. 2012;42(5):676-84. X-5
1381. Baltruschat L, Hasselhorn M, Tarbox J, et al. The Effects of Multiple Exemplar Training on a Working Memory Task Involving Sequential Responding in Children with Autism. Psychological Record. 2012 2012;62(3):549-61. X-3
1382. Banerjee R, Guiberson M. Evaluating Young Children from Culturally and Linguistically Diverse Backgrounds for Special Education Services. Young Exceptional Children. 2012;15(1):33-45. X-2, X-5
1383. Barnes RE, McCabe H. Should we welcome a cure for autism? A survey of the arguments. Med Health Care Philos. 2012 Aug;15(3):255-69. PMID: 21837546; X-5
1384. Barrett B, Byford S, Sharac J, et al. Service and wider societal costs of very young children with autism in the UK. Journal of Autism and Developmental Disorders. 2012;42(5):797-804. X-5
1385. Barton EE, Lawrence K, Deurloo F. Individualizing Interventions for Young Children with Autism in Preschool. Journal of Autism and Developmental Disorders. 2012;42(6):1205-17. X-2, X-3, X-4
1386. Barton EE, Pavilanis R. Teaching Pretend Play to Young Children with Autism. Young Exceptional Children. 2012;15(1):5-17. X-5
1387. Bastidas N, Mackay DD, Taylor JA, et al. Analysis of the long-term outcomes of nonsyndromic bicoronal synostosis. Plast Reconstr Surg. 2012 Oct;130(4):877-83. PMID: 22691840; X-5
1388. Bauch CT, Bhattacharyya S. Evolutionary game theory and social learning can determine how vaccine scares unfold. PLoS Comput Biol. 2012;8(4):e1002452. PMID: 22496631; X-5
1389. Bazzano A, Zeldin A, Schuster E, et al. Vaccine-related beliefs and practices of parents of children with autism spectrum disorders. Am J Intellect Dev Disabil. 2012 May;117(3):233-42. PMID: 22716265; X-5
1390. Ben Said M, Robel L, Pellegrin-Touati M, et al. TEDIS, Pervasive Developmental Disorder' patients information system, preliminary results. Stud Health Technol Inform. 2012;180:285-9. PMID: 22874197; X-4, X-5
1391. Bent S, Bertoglio K, Ashwood P, et al. Brief Report: Hyperbaric Oxygen Therapy (HBOT) in Children with Autism Spectrum Disorder--A Clinical Trial. Journal of Autism and Developmental Disorders. 2012;42(6):1127-32. X-5
1392. Berger KA. Praxis and autism: the psychomotor regulation sensory processing dimension-a report from the field. Front Integr Neurosci. 2012;6:129. PMID: 23346051; X-5
1393. Bergstrom R, Najdowski AC, Tarbox J. Teaching Children with Autism to Seek Help When Lost in Public. Journal of Applied Behavior Analysis. 2012;45(1):191-5. X-3
1394. Berry J, Katsiyannis A. Service Animals for Students with Disabilities under IDEA and Section 504 of the Rehabilitation Act of 1973. Intervention in School and Clinic. 2012;47(5):312-5. X-5
1395. Bevan Jones R, Thapar A, Lewis G, et al. The association between early autistic traits and psychotic experiences in adolescence. Schizophr Res. 2012 Mar;135(1-3):164-9. PMID: 22245185; X-5
1396. Bevan-Brown J, Bourke R, Butler P, et al. Essential Elements in a Professional Learning and Development Programme: A New Zealand Case Study of Autism Professional Development to Promote Collaborative Practices. Professional Development in Education. 2012;38(4):631-46. X-2, X-5
1397. Bharat S, Parikh P, Noel C, et al. Motion-compensated estimation of delivered dose during external beam radiation therapy: implementation in Philips' Pinnacle(3) treatment planning system. Med Phys. 2012 Jan;39(1):437-43. PMID: 22225314; X-5
1398. Birman CS, Elliott EJ, Gibson WP. Pediatric cochlear implants: additional disabilities prevalence, risk factors, and effect on language outcomes. Otol Neurotol. 2012 Oct;33(8):1347-52. PMID: 22975903; X-4, X-5
1399. Blackburn C, McDermott M, Bourke B. Clinical presentation of and outcome for solitary rectal ulcer syndrome in children. J Pediatr Gastroenterol Nutr. 2012 Feb;54(2):263-5. PMID: 22266488; X-5

1400. Blake JJ, Lund EM, Zhou Q, et al. National Prevalence Rates of Bully Victimization among Students with Disabilities in the United States. School Psychology Quarterly. 2012;27(4):210-22. X-5
1401. Bodner KE, Beversdorf DQ, Saklayen SS, et al. Noradrenergic moderation of working memory impairments in adults with autism spectrum disorder. J Int Neuropsychol Soc. 2012 May;18(3):556-64. PMID: 22414705; X-5
1402. Bolduc ME, du Plessis AJ, Sullivan N, et al. Regional cerebellar volumes predict functional outcome in children with cerebellar malformations. Cerebellum. 2012 Jun;11(2):531-42. PMID: 21901523; X-5
1403. Bonnal JL, Rock A, Jr., Gagnat A, et al. Confocal laser endomicroscopy of bladder tumors associated with photodynamic diagnosis: an ex vivo pilot study. Urology. 2012 Nov;80(5):1162 e1-5. PMID: 22950991; X-5
1404. Borthwick L. Adulthood: Life lessons. Nature. 2012 Nov 1;491(7422):S10-1. PMID: 23136653; X-5
1405. Bou Khalil R. Would some cannabinoids ameliorate symptoms of autism? European Child & Adolescent Psychiatry. 2012;21(4):237-8. X-1, X-2, X-3, X-4
1406. Boucher J. Research Review: Structural Language in Autistic Spectrum Disorder--Characteristics and Causes. Journal of Child Psychology and Psychiatry. 2012;53(3):219-33. X-5
1407. Bourret JC, Iwata BA, Harper JM, et al. Elimination of Position-Biased Responding in Individuals with Autism and Intellectual Disabilities. Journal of Applied Behavior Analysis. 2012;45(2):241-50. X-3, X-5
1408. Bourzac K. Child development: The first steps. Nature. 2012 Nov 1;491(7422):S7-9. PMID: 23136652; X-5
1409. Boutot AE, Hume K. Beyond Time out and Table Time: Today's Applied Behavior Analysis for Students with Autism. Education and Training in Autism and Developmental Disabilities. 2012;47(1):23-38. X-2, X-5
1410. Boyd BA, McDonough SG, Bodfish JW. Evidence-Based Behavioral Interventions for Repetitive Behaviors in Autism. Journal of Autism and Developmental Disorders. 2012;42(6):1236-48. X-2, X-5
1411. Braiden HJ, McDaniel B, McCrudden E, et al. A Practice-Based Evaluation of Barnardo's Forward Steps Early Intervention Programme for Children Diagnosed with Autism. Child Care in Practice. 2012;18(3):227-42. X-5
1412. Brookman-Frazee L, Baker-Ericzén M, Stadnick N, et al. Parent perspectives on community mental health services for children with autism spectrum disorders. Journal of Child and Family Studies. 2012;21(4):533-44. X-5
1413. Brookman-Frazee L, Drahota A, Stadnick N, et al. Therapist perspectives on community mental health services for children with autism spectrum disorders. Adm Policy Ment Health. 2012 Sep;39(5):365-73. PMID: 21533846; X-5
1414. Brookman-Frazee LI, Drahota A, Stadnick N. Training community mental health therapists to deliver a package of evidence-based practice strategies for school-age children with autism spectrum disorders: a pilot study. J Autism Dev Disord. 2012 Aug;42(8):1651-61. PMID: 22102293; X-5
1415. Brown HK, Ouellette-Kuntz H, Hunter D, et al. Unmet Needs of Families of School-Aged Children with an Autism Spectrum Disorder. Journal of Applied Research in Intellectual Disabilities. 2012;25(6):497-508. X-5
1416. Brown KF, Long SJ, Ramsay M, et al. U.K. parents' decision-making about measles-mumps-rubella (MMR) vaccine 10 years after the MMR-autism controversy: a qualitative analysis. Vaccine. 2012 Feb 27;30(10):1855-64. PMID: 22230590; X-5
1417. Buchbinder M. "Sticky" brains and sticky encounters in a U.S. pediatric pain clinic. Cult Med Psychiatry. 2012 Mar;36(1):102-23. PMID: 22006075; X-5
1418. Buggey T. Effectiveness of Video Self-Modeling to Promote Social Initiations by 3-Year-Olds With Autism Spectrum Disorders. Focus on Autism and Other Developmental Disabilities. 2012 Jun 2012;27(2):102-10. X-3
1419. Buggey T, Ogle L. Video Self-Modeling. Psychology in the Schools. 2012;49(1):52-70. X-5
1420. Burrell LT, Borrego J. Parents' Involvement in ASD Treatment: What Is Their Role? Cognitive and Behavioral Practice. 2012;19(3):423-32. X-5
1421. Busnelli M, Sauliere A, Manning M, et al. Functional selective oxytocin-derived agonists discriminate between individual G protein family subtypes. J Biol Chem. 2012 Feb 3;287(6):3617-29. PMID: 22069312; X-5
1422. Cai SX, Kornspan AS. The Use of Exergaming with Developmentally Disabled Students. Strategies: A Journal for Physical and Sport Educators. 2012;25(3):15-8. X-1, X-2, X-3, X-4
1423. Caldeira M, Edmunds A. Inconsistencies in Autism-Specific Emotion Interventions: Cause for Concern. Exceptionality Education International. 2012;22(1):17-36. X-1, X-2, X-3, X-4
1424. Cannella-Malone HI, Wheaton JE, Wu P-F, et al. Comparing the Effects of Video Prompting with and without Error Correction on Skill Acquisition for Students with Intellectual Disability. Education and Training in Autism and Developmental Disabilities. 2012;47(3):332-44. X-3, X-5
1425. Capozza LE, Bimstein E. Preferences of parents of children with autism spectrum disorders concerning oral health and dental treatment. Pediatr Dent. 2012 Nov-Dec;34(7):480-4. PMID: 23265165; X-5
1426. Cappadocia CM, Weiss JA, Pepler D. Bullying Experiences among Children and Youth with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders. 2012;42(2):266-77. X-5

1427. Cardon T, Azuma T. Visual Attending Preferences in Children with Autism Spectrum Disorders: A Comparison between Live and Video Presentation Modes. Research in Autism Spectrum Disorders. 2012;6(3):1061-7. X-5
1428. Carnahan CR, Basham JD, Christman J, et al. Overcoming Challenges: "Going Mobile with Your Own Video Models". TEACHING Exceptional Children. 2012;45(2):50-9. X-5
1429. Carp CL, Peterson SP, Arkel AJ, et al. A further evaluation of picture prompts during auditory-visual conditional discrimination training. J Appl Behav Anal. 2012 Winter;45(4):737-51. PMID: 23322929; X-3
1430. Cascio AM. Neurodiversity: Autism Pride among Mothers of Children with Autism Spectrum Disorders. Intellectual and Developmental Disabilities. 2012;50(3):273-83. X-5
1431. Cebula KR. Applied behavior analysis programs for autism: sibling psychosocial adjustment during and following intervention use. J Autism Dev Disord. 2012 May;42(5):847-62. PMID: 21725720; X-4, X-5
1432. Celebi O, Temucin CM, Elibol B, et al. Short latency afferent inhibition in Parkinson's disease patients with dementia. Mov Disord. 2012 Jul;27(8):1052-5. PMID: 22605543; X-5
1433. Chang MC, Parham LD, Blanche EI, et al. Autonomic and behavioral responses of children with autism to auditory stimuli. Am J Occup Ther. 2012 Sep-Oct;66(5):567-76. PMID: 22917123; X-5
1434. Cheng Y, Huang R. Using virtual reality environment to improve joint attention associated with pervasive developmental disorder. Res Dev Disabil. 2012 Nov-Dec;33(6):2141-52. PMID: 22776822; X-3
1435. Chia NKH, Li J. Design of a Generic Questionnaire for Reflective Evaluation of a Virtual Reality-Based Intervention Using Virtual Dolphins for Children with Autism. International Journal of Special Education. 2012 2012;27(3):45-53. X-1, X-2, X-3, X-4
1436. Ching H, Pringsheim T. Aripiprazole for autism spectrum disorders (ASD). Cochrane Database Syst Rev. 2012;5:CD009043. PMID: 22592735; X-5
1437. Chiri G, Warfield ME. Unmet need and problems accessing core health care services for children with autism spectrum disorder. Matern Child Health J. 2012 Jul;16(5):1081-91. PMID: 21667201; X-5
1438. Chitragran R, Poopitaya S, Tassanawipas W. Result of percutaneous disc decompression using nucleoplasty in Thailand: a randomized controlled trial. J Med Assoc Thai. 2012 Oct;95 Suppl 10:S198-205. PMID: 23451463; X-5
1439. Chou M-C, Chou W-J, Chiang H-L, et al. Sleep problems among Taiwanese children with autism, their siblings and typically developing children. Research in Autism Spectrum Disorders. 2012;6(2):665-72. X-5
1440. Chuang IC, Tseng M-H, Lu L, et al. Sensory Correlates of Difficult Temperament Characteristics in Preschool Children with Autism. Research in Autism Spectrum Disorders. 2012;6(3):988-95. X-5
1441. Chung Y-C, Carter EW, Sisco LG. A Systematic Review of Interventions to Increase Peer Interactions for Students with Complex Communication Challenges. TASH. 1025 Vermont Avenue 7th Floor, Washington, DC 20005.; 2012. p. 271-87. X-1, X-2, X-3, X-4
1442. Cihak DF, Kildare LK, Smith CC, et al. Using video Social Stories to increase task engagement for middle school students with autism spectrum disorders. Behav Modif. 2012 May;36(3):399-425. PMID: 22609764; X-1, X-3, X-5
1443. Cihak DF, Smith CC, Cornett A, et al. The Use of Video Modeling with the Picture Exchange Communication System to Increase Independent Communicative Initiations in Preschoolers with Autism and Developmental Delays. Focus on Autism and Other Developmental Disabilities. 2012;27(1):3-11. X-3
1444. Cimera RE, Wehman P, West M, et al. Do sheltered workshops enhance employment outcomes for adults with autism spectrum disorder? Autism. 2012 Jan;16(1):87-94. PMID: 21610189; X-5
1445. Cleary A, Walsh F, Connolly H, et al. Monitoring and documentation of side effects from depot antipsychotic medication: an interdisciplinary audit of practice in a regional mental health service. J Psychiatr Ment Health Nurs. 2012 Jun;19(5):395-401. PMID: 22070791; X-4, X-5
1446. Cohen D, Bonnot O, Bodeau N, et al. Adverse effects of second-generation antipsychotics in children and adolescents: a Bayesian meta-analysis. J Clin Psychopharmacol. 2012 Jun;32(3):309-16. PMID: 22544019; X-5
1447. Colon CL, Ahearn WH, Clark KM, et al. The effects of verbal operant training and response interruption and redirection on appropriate and inappropriate vocalizations. J Appl Behav Anal. 2012 Spring;45(1):107-20. PMID: 22403453; X-3
1448. Constantine RJ, Jentz S, Bengtson M, et al. Exposure to antipsychotic medications over a 4-year period among children who initiated antipsychotic treatment before their sixth birthday. Pharmacoepidemiol Drug Saf. 2012 Feb;21(2):152-60. PMID: 21793097; X-5
1449. Coo H, Ouellette-Kuntz H, Lam M, et al. Correlates of age at diagnosis of autism spectrum disorders in six Canadian regions. Chronic Dis Inj Can. 2012 Mar;32(2):90-100. PMID: 22414306; X-5

1450. Cornish K, Cole V, Longhi E, et al. Does attention constrain developmental trajectories in fragile x syndrome? A 3-year prospective longitudinal study. Am J Intellect Dev Disabil. 2012 Mar;117(2):103-20. PMID: 22515826; X-5
1451. Corrigan NM, Shaw WD, Richards TL, et al. Proton Magnetic Resonance Spectroscopy and MRI Reveal No Evidence for Brain Mitochondrial Dysfunction in Children with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders. 2012;42(1):105-15. X-5
1452. Costigan FA, Light JC, Newell KM. Factors affecting computer mouse use for young children: implications for AAC. Augment Altern Commun. 2012 Jun;28(2):85-95. PMID: 22670726; X-4, X-5
1453. Coury DL, Anagnostou E, Manning-Courtney P, et al. Use of psychotropic medication in children and adolescents with autism spectrum disorders. Pediatrics. 2012 Nov;130 Suppl 2:S69-76. PMID: 23118256; X-4, X-5
1454. Cox DJ. From Interdisciplinary to Integrated Care of the Child with Autism: The Essential Role for a Code of Ethics. Journal of Autism and Developmental Disorders. 2012;42(12):2729-38. X-5
1455. Crosland K, Dunlap G. Effective Strategies for the Inclusion of Children with Autism in General Education Classrooms. Behavior Modification. 2012;36(3):251-69. X-2, X-5
1456. Cruz I, Vicaria I, Wang NY, et al. Language and behavioral outcomes in children with developmental disabilities using cochlear implants. Otol Neurotol. 2012 Jul;33(5):751-60. PMID: 22699986; X-3, X-4
1457. Cunningham AB. Measuring change in social interaction skills of young children with autism. J Autism Dev Disord. 2012 Apr;42(4):593-605. PMID: 21638109; X-5
1458. Danesh AA, Kaf WA. DPOAEs and contralateral acoustic stimulation and their link to sound hypersensitivity in children with autism. Int J Audiol. 2012 Apr;51(4):345-52. PMID: 22299666; X-5
1459. Danzer E, Siegle J, D'Agostino JA, et al. Early neurodevelopmental outcome of infants with high-risk fetal lung lesions. Fetal Diagn Ther. 2012;31(4):210-5. PMID: 22539010; X-5
1460. De Andres-Garcia S, Moya-Albiol L, Gonzalez-Bono E. Salivary cortisol and immunoglobulin A: responses to stress as predictors of health complaints reported by caregivers of offspring with autistic spectrum disorder. Horm Behav. 2012 Sep;62(4):464-74. PMID: 22981424; X-5
1461. de Boer A, Pijl SJ, Post W, et al. Which Variables Relate to the Attitudes of Teachers, Parents and Peers towards Students with Special Educational Needs in Regular Education? Educational Studies. 2012;38(4):433-48. X-5
1462. de Bruin EI, Verheij F. Social skills training in children with PDD-NOS: an exploratory study. Int J Psychiatry Clin Pract. 2012 Mar;16(1):60-7. PMID: 22122657; X-5
1463. De Bruyn L, Moelants D, Leman M. An embodied approach to testing musical empathy in participants with an autism spectrum disorder. Music and Medicine. 2012;4(1):28-36. X-5
1464. de Hoogd S, Overbeek WA, Heerdink ER, et al. Differences in body mass index z-scores and weight status in a Dutch pediatric psychiatric population with and without use of second-generation antipsychotics. J Child Adolesc Psychopharmacol. 2012 Apr;22(2):166-73. PMID: 22506734; X-3, X-4
1465. de Winter FC, Bastiaanse PL, Hilgenkamp IT, et al. Overweight and Obesity in Older People with Intellectual Disability. Research in Developmental Disabilities: A Multidisciplinary Journal. 2012;33(2):398-405. X-5
1466. DeLong G. Conflicts of interest in vaccine safety research. Account Res. 2012;19(2):65-88. PMID: 22375842; X-5
1467. Dente CL, Parkinson Coles K. Ecological Approaches to Transition Planning for Students with Autism and Asperger's Syndrome. Children & Schools. 2012;34(1):27-36. X-5
1468. DePape AM, Hall GB, Tillmann B, et al. Auditory processing in high-functioning adolescents with Autism Spectrum Disorder. PLoS One. 2012;7(9):e44084. PMID: 22984462; X-5
1469. Desai MU, Divan G, Wertz FJ, et al. The discovery of autism: Indian parents' experiences of caring for their child with an autism spectrum disorder. Transcult Psychiatry. 2012 Jul;49(3-4):613-37. PMID: 22722980; X-5
1470. Deutsch SI, Pepe GJ, Burket JA, et al. D-cycloserine improves sociability and spontaneous stereotypic behaviors in 4-week old mice. Brain Res. 2012 Feb 23;1439:96-107. PMID: 22261249; X-5
1471. Devic S, Tomic N, Aldelaijan S, et al. Linearization of dose-response curve of the radiochromic film dosimetry system. Med Phys. 2012 Aug;39(8):4850-7. PMID: 22894411; X-5
1472. Diehl JJ, Schmitt LM, Villano M, et al. The Clinical Use of Robots for Individuals with Autism Spectrum Disorders: A Critical Review. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2012. p. 249-62. X-2, X-3, X-4
1473. Dillenburger K. Why reinvent the wheel? A behaviour analyst's reflections on pedagogy for inclusion for students with intellectual and developmental disability. J Intellect Dev Disabil. 2012 Jun;37(2):169-80. PMID: 22563693; X-2, X-5

1474. Dillenburger K, Keenan M, Doherty A, et al. ABA-Based Programs for Children Diagnosed with Autism Spectrum Disorder: Parental and Professional Experiences at School and at Home. Child & Family Behavior Therapy. 2012;34(2):111-29. X-1, X-3, X-4
1475. Divan G, Vajaratkar V, Desai MU, et al. Challenges, coping strategies, and unmet needs of families with a child with autism spectrum disorder in Goa, India. Autism Res. 2012 Jun;5(3):190-200. PMID: 22473816; X-5
1476. Donohue SE, Darling EF, Mitroff SR. Links between multisensory processing and autism. Exp Brain Res. 2012 Oct;222(4):377-87. PMID: 22923209; X-5
1477. Doucette S, DiGennaro Reed FD, Reed DD, et al. Implementation of a Posted Schedule to Increase Class-Wide Interobserver Agreement Assessment. Journal of Organizational Behavior Management. 2012;32(3):263-9. X-5
1478. Draga RO, Grimbergen MC, Kok ET, et al. The quality of 5-aminolevulinic acid-induced photodynamic diagnosis and transurethral resection of bladder tumors: does the urologist play a role? Urol Int. 2012;89(3):326-31. PMID: 22986952; X-5
1479. Drahota A, Aarons GA, Stahmer AC. Developing the Autism Model of Implementation for autism spectrum disorder community providers: study protocol. Implement Sci. 2012;7:85. PMID: 22963616; X-5
1480. Drake J, Johnson N, Stoneck AV, et al. Evaluation of a coping kit for children with challenging behaviors in a pediatric hospital. Pediatr Nurs. 2012 Jul-Aug;38(4):215-21. PMID: 22970487; X-5
1481. Dubois B, Tolosa E, Katzenschlager R, et al. Donepezil in Parkinson's disease dementia: a randomized, double-blind efficacy and safety study. Mov Disord. 2012 Sep 1;27(10):1230-8. PMID: 22915447; X-5
1482. Ducharme JM, Ng O. Errorless Academic Compliance Training: A School-Based Application for Young Students with Autism. Behavior Modification. 2012;36(5):650-69. X-3
1483. Dunkel-Jackson SM, Dixon MR, Szekely S. Portable Data Assistants: Potential in Evidence-Based Practice Autism Treatment. Research in Autism Spectrum Disorders. 2012;6(1):65-72. X-5
1484. Dunn W, Cox J, Foster L, et al. Impact of a contextual intervention on child participation and parent competence among children with autism spectrum disorders: a pretest-posttest repeated-measures design. Am J Occup Ther. 2012 Sep-Oct;66(5):520-8. PMID: 22917118; X-5
1485. Dworzynski K, Ronald A, Bolton P, et al. How different are girls and boys above and below the diagnostic threshold for autism spectrum disorders? J Am Acad Child Adolesc Psychiatry. 2012 Aug;51(8):788-97. PMID: 22840550; X-5
1486. Dykstra JR, Boyd BA, Watson LR, et al. The impact of the Advancing Social-communication And Play (ASAP) intervention on preschoolers with autism spectrum disorder. Autism. 2012 Jan;16(1):27-44. PMID: 21788256; X-3
1487. Early MC, Erickson CA, Wink LK, et al. Case Report: 16-Year-Old Male with Autistic Disorder with Preoccupation with Female Feet. Journal of Autism and Developmental Disorders. 2012;42(6):1133-7. X-5
1488. Edwards TL, Watkins EE, Lotfizadeh AD, et al. Intervention Research to Benefit People with Autism: How Old Are the Participants? Research in Autism Spectrum Disorders. 2012;6(3):996-9. X-5
1489. Eisenberg E. Long-term outcomes in children born after assisted conception. Semin Reprod Med. 2012 Apr;30(2):123-30. PMID: 22549712; X-5
1490. Eisenstein M. Treatments: In the waiting room. Nature. 2012 Nov 1;491(7422):S14-6. PMID: 23136658; X-5
1491. Emck C, Bosscher RJ, van Wieringen PC, et al. Psychiatric symptoms in children with gross motor problems. Adapt Phys Activ Q. 2012 Apr;29(2):161-78. PMID: 22467835; X-5
1492. Enticott PG, Kennedy HA, Rinehart NJ, et al. Mirror neuron activity associated with social impairments but not age in autism spectrum disorder. Biol Psychiatry. 2012 Mar 1;71(5):427-33. PMID: 21974786; X-5
1493. Enticott PG, Rinehart NJ, Tonge BJ, et al. Repetitive transcranial magnetic stimulation (rTMS) improves movement-related cortical potentials in autism spectrum disorders. Brain Stimul. 2012 Jan;5(1):30-7. PMID: 22037133; X-1, X-3
1494. Eriksson MA, Westerlund J, Anderlid BM, et al. First-degree relatives of young children with autism spectrum disorders: some gender aspects. Res Dev Disabil. 2012 Sep-Oct;33(5):1642-8. PMID: 22554810; X-5
1495. Evans WE, Must A, Anderson SE, et al. Dietary Patterns and Body Mass Index in Children with Autism and Typically Developing Children. Research in Autism Spectrum Disorders. 2012;6(1):399-405. X-5
1496. Eyler LT, Pierce K, Courchesne E. A failure of left temporal cortex to specialize for language is an early emerging and fundamental property of autism. Brain. 2012 Mar;135(Pt 3):949-60. PMID: 22350062; X-5
1497. Faja S, Webb SJ, Jones E, et al. The effects of face expertise training on the behavioral performance and brain activity of adults with high functioning autism spectrum disorders. J Autism Dev Disord. 2012 Feb;42(2):278-93. PMID: 21484517; X-5

1498. Falcomata TS, Roane HS, Muething CS, et al. Functional Communication Training and Chained Schedules of Reinforcement to Treat Challenging Behavior Maintained by Terminations of Activity Interruptions. Behavior Modification. 2012;36(5):630-49. X-3
1499. Farrell L, Waters A, Milliner E, et al. Comorbidity and treatment response in pediatric obsessive-compulsive disorder: A pilot study of group cognitive-behavioral treatment. Psychiatry Research. 2012;199(2):115-23. X-1, X-3, X-4
1500. Fava L, Vicari S, Valeri G, et al. Intensive Behavioral Intervention for School-Aged Children with Autism: Una Breccia nel Muro (UBM)--A Comprehensive Behavioral Model. Research in Autism Spectrum Disorders. 2012;6(4):1273-88. X-1, X-2, X-3, X-4
1501. Felce D, Perry J. Diagnostic grouping among adults with intellectual disabilities and autistic spectrum disorders in staffed housing. J Intellect Disabil Res. 2012 Dec;56(12):1187-93. PMID: 22044559; X-5
1502. Fentress GM, Lerman DC. A Comparison of Two Prompting Procedures for Teaching Basic Skills to Children with Autism. Research in Autism Spectrum Disorders. 2012;6(3):1083-90. X-3
1503. Fernandes FDM, De La Higuera Amato CA, Molini-Avejonas DR. Language therapy results with children of the autism spectrum. Revista de Logopedia, Foniatría y Audiología. 2012;32(1):2-6. X-5
1504. Ferraioli SJ, Hansford A, Harris SL. Benefits of Including Siblings in the Treatment of Autism Spectrum Disorders. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2012. p. 413-22. X-4
1505. Fiks AG, Mayne S, Hughes CC, et al. Development of an instrument to measure parents' preferences and goals for the treatment of attention deficit-hyperactivity disorder. Acad Pediatr. 2012 Sep-Oct;12(5):445-55. PMID: 22748759; X-5
1506. Finn HE, Miguel CF, Ahearn WH. The Emergence of Untrained Mands and Tacts in Children with Autism. Journal of Applied Behavior Analysis. 2012;45(2):265-80. X-3
1507. Fischetti AT, Wilder DA, Myers K, et al. An Evaluation of Evidence-Based Interventions to Increase Compliance among Children with Autism. Journal of Applied Behavior Analysis. 2012;45(4):859-63. X-3, X-5
1508. Fleischer AS. Support to students with Asperger syndrome in higher education--the perspectives of three relatives and three coordinators. Int J Rehabil Res. 2012 Mar;35(1):54-61. PMID: 22315142; X-5
1509. Fleming AR, Fairweather JS. The Role of Postsecondary Education in the Path From High School to Work for Youth With Disabilities. Rehabilitation Counseling Bulletin. 2012;55(2):71-81. X-5
1510. Fletcher PC, Markoulakis R, Bryden PJ. The costs of caring for a child with an autism spectrum disorder. Issues Compr Pediatr Nurs. 2012;35(1):45-69. PMID: 22250966; X-5
1511. Flores M, Musgrove K, Renner S, et al. A comparison of communication using the Apple iPad and a picture-based system. Augment Altern Commun. 2012 Jun;28(2):74-84. PMID: 22263895; X-3
1512. Flynn L, Healy O. A Review of Treatments for Deficits in Social Skills and Self-Help Skills in Autism Spectrum Disorder. Research in Autism Spectrum Disorders. 2012;6(1):431-41. X-1, X-2, X-3, X-4
1513. Fogleman CD. Therapies for children with autism spectrum disorders. Am Fam Physician. 2012 May 1;85(9):878-80. PMID: 22612182; X-1, X-2, X-3, X-4
1514. Foley AG, Gannon S, Rombach-Mullan N, et al. Class I histone deacetylase inhibition ameliorates social cognition and cell adhesion molecule plasticity deficits in a rodent model of autism spectrum disorder. Neuropharmacology. 2012 Sep;63(4):750-60. PMID: 22683514; X-5
1515. Forbes D, Parsons H. Essential fatty acids: food for mind and body. Acta Paediatr. 2012 Aug;101(8):808-10. PMID: 22646925; X-5
1516. Foster EM, Pearson E. Is inclusivity an indicator of quality of care for children with autism in special education? Pediatrics. 2012 Nov;130 Suppl 2:S179-85. PMID: 23118249; X-5
1517. Fragale CL, O'Reilly MF, Aguilar J, et al. The influence of motivating operations on generalization probes of specific mands by children with autism. J Appl Behav Anal. 2012 Fall;45(3):565-77. PMID: 23060669; X-3
1518. Frank-Crawford MA, Borrero JC, Nguyen L, et al. Disruptive Effects of Contingent Food on High-Probability Behavior. Journal of Applied Behavior Analysis. 2012;45(1):143-8. X-3
1519. Fraser R, Cotton S, Gentle E, et al. Non-expert clinicians' detection of autistic traits among attenders of a youth mental health service. Early Intervention in Psychiatry. 2012;6(1):83-6. X-5
1520. Frazier TW, Youngstrom EA, Speer L, et al. Validation of Proposed "DSM-5" Criteria for Autism Spectrum Disorder. Journal of the American Academy of Child & Adolescent Psychiatry. 2012;51(1):28-40. X-5
1521. Freitag CM, Feineis-Matthews S, Valerian J, et al. The Frankfurt early intervention program FFIP for preschool aged children with autism spectrum disorder: A pilot study. Journal of Neural Transmission. 2012;119(9):1011-21. X-5
1522. Fritz JN, Iwata BA, Rolider NU, et al. Analysis of Self-Recording in Self-Management Interventions for Stereotypy. Journal of Applied Behavior Analysis. 2012;45(1):55-68. X-1, X-3, X-4

1523. Fryling MJ, Wallace MD, Yassine JN. Impact of Treatment Integrity on Intervention Effectiveness. Journal of Applied Behavior Analysis. 2012;45(2):449-53. X-5
1524. Fung LK, Chahal L, Libove RA, et al. A retrospective review of the effectiveness of aripiprazole in the treatment of sensory abnormalities in autism. J Child Adolesc Psychopharmacol. 2012 Jun;22(3):245-8. PMID: 22537360; X-1, X-3
1525. Gabriels RL, Agnew JA, Holt KD, et al. Pilot study measuring the effects of therapeutic horseback riding on school-age children and adolescents with autism spectrum disorders. Research in Autism Spectrum Disorders. 2012;6(2):578-88. X-5
1526. Gaesser GA, Angadi SS. Gluten-free diet: imprudent dietary advice for the general population? J Acad Nutr Diet. 2012 Sep;112(9):1330-3. PMID: 22939437; X-5
1527. Galizia EC, Srikantha M, Palmer R, et al. Array comparative genomic hybridization: results from an adult population with drug-resistant epilepsy and co-morbidities. Eur J Med Genet. 2012 May;55(5):342-8. PMID: 22342432; X-5
1528. Gallagher S, Whiteley J. Social support is associated with blood pressure responses in parents caring for children with developmental disabilities. Res Dev Disabil. 2012 Nov-Dec;33(6):2099-105. PMID: 22771985; X-5
1529. Gantman A, Kapp SK, Orenski K, et al. Social skills training for young adults with high-functioning autism spectrum disorders: a randomized controlled pilot study. J Autism Dev Disord. 2012 Jun;42(6):1094-103. PMID: 21915740; X-5
1530. Ganz JB, Davis JL, Lund EM, et al. Meta-Analysis of PECS with Individuals with ASD: Investigation of Targeted versus Non-Targeted Outcomes, Participant Characteristics, and Implementation Phase. Research in Developmental Disabilities: A Multidisciplinary Journal. 2012;33(2):406-18. X-5
1531. Ganz JB, Earles-Vollrath TL, Heath AK, et al. A Meta-Analysis of Single Case Research Studies on Aided Augmentative and Alternative Communication Systems with Individuals with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders. 2012;42(1):60-74. X-5
1532. Ganz JB, Heath AK, Lund EM, et al. Effects of peer-mediated implementation of visual scripts in middle school. Behav Modif. 2012 May;36(3):378-98. PMID: 22582326; X-1, X-3, X-5
1533. Garland KV, Vasquez E, Pearl C. Efficacy of Individualized Clinical Coaching in a Virtual Reality Classroom for Increasing Teachers' Fidelity of Implementation of Discrete Trial Teaching. Education and Training in Autism and Developmental Disabilities. 2012;47(4):502-15. X-5
1534. Gau SS-F, Chou M-C, Chiang H-L, et al. Parental adjustment, marital relationship, and family function in families of children with autism. Research in Autism Spectrum Disorders. 2012;6(1):263-70. X-5
1535. Gelbar NW, Anderson C, McCarthy S, et al. Video Self-Modeling as an Intervention Strategy for Individuals with Autism Spectrum Disorders. Psychology in the Schools. 2012;49(1):15-22. X-5
1536. Geluk CA, Jansen LM, Vermeiren R, et al. Autistic Symptoms in Childhood Arrestees: Longitudinal Association with Delinquent Behavior. Journal of Child Psychology and Psychiatry. 2012;53(2):160-7. X-5
1537. Geretsegger M, Holck U, Gold C. Randomised controlled trial of improvisational music therapy's effectiveness for children with autism spectrum disorders (TIME-A): study protocol. BMC Pediatr. 2012;12:2. PMID: 22221670; X-5
1538. Geurts HM, Jansen MD. A retrospective chart study: the pathway to a diagnosis for adults referred for ASD assessment. Autism. 2012 May;16(3):299-305. PMID: 21949003; X-5
1539. Giarelli E, Ruttenberg J, Segal A. Continuing education for nurses in the clinical management of autism spectrum disorders: results of a pilot evaluation. J Contin Educ Nurs. 2012 Apr;43(4):169-76. PMID: 22106877; X-5
1540. Giles AF, St Peter CC, Pence ST, et al. Preference for blocking or response redirection during stereotypy treatment. Res Dev Disabil. 2012 Nov-Dec;33(6):1691-700. PMID: 22695072; X-3
1541. Giovannetti T, Britnell P, Brennan L, et al. Everyday action impairment in Parkinson's disease dementia. J Int Neuropsychol Soc. 2012 Sep;18(5):787-98. PMID: 22621995; X-5
1542. Goffin D, Allen M, Zhang L, et al. Rett syndrome mutation MeCP2 T158A disrupts DNA binding, protein stability and ERP responses. Nat Neurosci. 2012 Feb;15(2):274-83. PMID: 22119903; X-5
1543. Golnik A, Maccabee-Ryaboy N, Scal P, et al. Shared decision making: improving care for children with autism. Intellect Dev Disabil. 2012 Aug;50(4):322-31. PMID: 22861133; X-3, X-4, X-5
1544. Golnik A, Scal P, Wey A, et al. Autism-specific primary care medical home intervention. J Autism Dev Disord. 2012 Jun;42(6):1087-93. PMID: 21853373; X-4
1545. Gongola L, Sweeney J. Discrete Trial Teaching: Getting Started. Intervention in School and Clinic. 2012;47(3):183-90. X-5

1546. Goodarzi M, Hemayattalab R. Bone Mineral Density Accrual in Students with Autism Spectrum Disorders: Effects of Calcium Intake and Physical Training. Research in Autism Spectrum Disorders. 2012;6(2):690-5. X-4
1547. Gor RA, Fuhrer J, Schober JM. A retrospective observational study of enuresis, daytime voiding symptoms, and response to medical therapy in children with attention deficit hyperactivity disorder and autism spectrum disorder. J Pediatr Urol. 2012 Jun;8(3):314-7. PMID: 21131234; X-5
1548. Graff RB, Karsten AM. Evaluation of a self-instruction package for conducting stimulus preference assessments. J Appl Behav Anal. 2012 Spring;45(1):69-82. PMID: 22403450; X-5
1549. Graham LJ. Disproportionate Over-Representation of Indigenous Students in New South Wales Government Special Schools. Cambridge Journal of Education. 2012;42(2):163-76. X-5
1550. Grandgeorge M, Tordjman S, Lazartigues A, et al. Does pet arrival trigger prosocial behaviors in individuals with autism? PLoS One. 2012;7(8). X-1, X-3, X-4
1551. Granger S, des Rivieres-Pigeon C, Sabourin G, et al. Mothers' Reports of Their Involvement in Early Intensive Behavioral Intervention. Topics in Early Childhood Special Education. 2012;32(2):68-77. X-4, X-5
1552. Grannan L, Rehfeldt RA. Emergent intraverbal responses via tact and match-to-sample instruction. J Appl Behav Anal. 2012 Fall;45(3):601-5. PMID: 23060673; X-3, X-5
1553. Greenberg AL, Tomaino MAE, Charlop MH. Assessing generalization of the Picture Exchange Communication System in children with autism. Journal of Developmental and Physical Disabilities. 2012;24(6):539-58. X-5
1554. Griffith GM, Fletcher R, Hastings RP. A national UK census of Applied Behavior Analysis school provision for children with autism. Research in Autism Spectrum Disorders. 2012;6(2):798-805. X-5
1555. Griffith GM, Totsika V, Nash S, et al. 'I just don't fit anywhere': support experiences and future support needs of individuals with Asperger syndrome in middle adulthood. Autism. 2012 Sep;16(5):532-46. PMID: 21610188; X-5
1556. Griffith GM, Totsika V, Nash S, et al. "We Are All There Silently Coping." The Hidden Experiences of Parents of Adults with Asperger Syndrome. Journal of Intellectual & Developmental Disability. 2012;37(3):237-47. X-5
1557. Grindle CF, Hastings RP, Saville M, et al. Outcomes of a behavioral education model for children with autism in a mainstream school setting. Behav Modif. 2012 May;36(3):298-319. PMID: 22569577; X-5
1558. Grinker RR, Chambers N, Njongwe N, et al. "Communities" in community engagement: lessons learned from autism research in South Korea and South Africa. Autism Res. 2012 Jun;5(3):201-10. PMID: 22566396; X-3, X-4, X-5
1559. Grossman RB, Tager-Flusberg H. "Who said that?" Matching of low- and high-intensity emotional prosody to facial expressions by adolescents with ASD. J Autism Dev Disord. 2012 Dec;42(12):2546-57. PMID: 22450703; X-5
1560. Grynszpan O, Nadel J, Martin JC, et al. Self-monitoring of gaze in high functioning autism. J Autism Dev Disord. 2012 Aug;42(8):1642-50. PMID: 22102292; X-1, X-3, X-4
1561. Gurkan KC, Hagerman RJ. Targeted Treatments in Autism and Fragile X Syndrome. Research in Autism Spectrum Disorders. 2012;6(4):1311-20. X-5
1562. Gutman SA, Raphael-Greenfield EI, Rao AK. Effect of a motor-based role-play intervention on the social behaviors of adolescents with high-functioning autism: multiple-baseline single-subject design. Am J Occup Ther. 2012 Sep-Oct;66(5):529-37. PMID: 22917119; X-5
1563. Guzinski EM, Cihon TM, Eshleman J. The Effects of Tact Training on Stereotypic Vocalizations in Children with Autism. Analysis of Verbal Behavior. 2012;28:101-10. X-3, X-5
1564. Hagebeuk EEO, Duran M, Koelman JHTM, et al. Folinic acid supplementation in rett syndrome patients does not influence the course of the disease: A randomized study. Journal of Child Neurology. 2012;27(3):304-9. X-5
1565. Hagner D, Kurtz A, Cloutier H, et al. Outcomes of a Family-Centered Transition Process for Students with Autism Spectrum Disorders. Focus on Autism and Other Developmental Disabilities. 2012;27(1):42-50. X-5
1566. Hahn S. Environments and autistic spectrum conditions. Nurs Times. 2012 Dec 4-10;108(49):23-5. PMID: 23342838; X-3, X-4, X-5
1567. Hall SS, Lightbody AA, McCarthy BE, et al. Effects of intranasal oxytocin on social anxiety in males with fragile X syndrome. Psychoneuroendocrinology. 2012 Apr;37(4):509-18. PMID: 21862226; X-5
1568. Halpert J. Altering the primal environment: health effects associated with assisted reproductive technologies. Environ Health Perspect. 2012 Oct;120(10):a390-5. PMID: 23026346; X-5
1569. Hamilton A, Marshal MP, Sucato GS, et al. Rett syndrome and menstruation. J Pediatr Adolesc Gynecol. 2012 Apr;25(2):122-6. PMID: 22206685; X-5

1570. Hammock E, Veenstra-VanderWeele J, Yan Z, et al. Examining Autism Spectrum Disorders by Biomarkers: Example from the Oxytocin and Serotonin Systems. Journal of the American Academy of Child & Adolescent Psychiatry. 2012;51(7):712-21. X-5
1571. Hardan AY, Fung LK, Libove RA, et al. A randomized controlled pilot trial of oral N-acetylcysteine in children with autism. Biol Psychiatry. 2012 Jun 1;71(11):956-61. PMID: 22342106; X-5
1572. Harfterkamp M, van de Loo-Neus G, Minderaa RB, et al. A randomized double-blind study of atomoxetine versus placebo for attention-deficit/hyperactivity disorder symptoms in children with autism spectrum disorder. J Am Acad Child Adolesc Psychiatry. 2012 Jul;51(7):733-41. PMID: 22721596; X-5
1573. Harjusola-Webb SM, Robbins SH. The Effects of Teacher-Implemented Naturalistic Intervention on the Communication of Preschoolers with Autism. Topics in Early Childhood Special Education. 2012;32(2):99-110. X-3
1574. Hart JE, Whalon KJ. Using Video Self-Modeling via iPads to Increase Academic Responding of an Adolescent with Autism Spectrum Disorder and Intellectual Disability. Education and Training in Autism and Developmental Disabilities. 2012 December 2012;47(4):438-46. X-5
1575. Hasanzadeh E, Mohammadi MR, Ghanizadeh A, et al. A double-blind placebo controlled trial of Ginkgo biloba added to risperidone in patients with autistic disorders. Child Psychiatry Hum Dev. 2012 Oct;43(5):674-82. PMID: 22392415; X-5
1576. Hass MR, Brown RS, Brady J, et al. Validating the BASC-TRS for Use with Children and Adolescents with an Educational Diagnosis of Autism. Remedial and Special Education. 2012;33(3):173-83. X-5
1577. Hassiotis A, Turk J. Mental Health Needs in Adolescents with Intellectual Disabilities: Cross-Sectional Survey of a Service Sample. Journal of Applied Research in Intellectual Disabilities. 2012;25(3):252-61. X-5
1578. Hastings RP, Robertson J, Yasamy TM. Interventions for Children with Pervasive Developmental Disorders in Low and Middle Income Countries. Wiley-Blackwell. 350 Main Street, Malden, MA 02148.; 2012. p. 119-34. X-4
1579. Heldt J, Schlinger HD. Increased Variability in Tacting under a Lag 3 Schedule of Reinforcement. Analysis of Verbal Behavior. 2012;28:131-6. X-3, X-5
1580. Hewitt AS, Stancliffe RJ, Sirek AJ, et al. Characteristics of adults with autism spectrum disorder who use adult developmental disability services: Results from 25 US states. Research in Autism Spectrum Disorders. 2012;6(2):741-51. X-5
1581. Hill DA, Hill SJ. Autism Spectrum Disorder, Individuals with Disabilities Education Act, and Case Law: Who Really Wins? Preventing School Failure. 2012;56(3):157-64. X-5
1582. Hillier A, Greher G, Poto N, et al. Positive outcomes following participation in a music intervention for adolescents and young adults on the autism spectrum. Psychology of Music. 2012;40(2):201-15. X-5
1583. Hiraoka K, Okamura N, Funaki Y, et al. Cholinergic deficit and response to donepezil therapy in Parkinson's disease with dementia. Eur Neurol. 2012;68(3):137-43. PMID: 22832236; X-5
1584. Ho JG, Caldwell RL, McDougle CJ, et al. The effects of aripiprazole on electrocardiography in children with pervasive developmental disorders. J Child Adolesc Psychopharmacol. 2012 Aug;22(4):277-83. PMID: 22849533; X-5
1585. Hoddenbach E, Koot HM, Clifford P, et al. Individual differences in the efficacy of a short theory of mind intervention for children with autism spectrum disorder: a randomized controlled trial. Trials. 2012;13:206. PMID: 23140338; X-5
1586. Hollander E, Soorya L, Chaplin W, et al. A double-blind placebo-controlled trial of fluoxetine for repetitive behaviors and global severity in adult autism spectrum disorders. Am J Psychiatry. 2012 Mar;169(3):292-9. PMID: 22193531; X-1, X-3, X-4, X-5
1587. Holler K, Scalzo A. "I've heard some things that scare me". Responding with empathy to parents' fears of vaccinations. Mo Med. 2012 Jan-Feb;109(1):10-3, 6-8. PMID: 22428439; X-5
1588. Holton A, Weberling B, Clarke CE, et al. The blame frame: Media attribution of culpability about the MMR–autism vaccination scare. Health Communication. 2012;27(7):690-701. X-5
1589. Honaker D, Rosello SS, Candler C. Test-retest reliability of Family L.I.F.E. (Looking Into Family Experiences): an occupation-based assessment. Am J Occup Ther. 2012 Sep-Oct;66(5):617-20. PMID: 22917128; X-3, X-4, X-5
1590. Horovitz M, Matson JL, Barker A. The relationship between symptoms of autism spectrum disorders and psychotropic medication use in infants and toddlers. Research in Autism Spectrum Disorders. 2012;6(4):1406-11. X-4

1591. Howell DM, Wittman P, Bundy MB. Interprofessional clinical education for occupational therapy and psychology students: a social skills training program for children with autism spectrum disorders. J Interprof Care. 2012 Jan;26(1):49-55. PMID: 22233368; X-3, X-5
1592. Hua Y, Hendrickson JM, Therrien WJ, et al. Effects of Combined Reading and Question Generation on Reading Fluency and Comprehension of Three Young Adults with Autism and Intellectual Disability. Focus on Autism and Other Developmental Disabilities. 2012;27(3):135-46. X-5
1593. Hughes C, Kaplan L, Bernstein R, et al. Increasing Social Interaction Skills of Secondary School Students with Autism and/or Intellectual Disability: A Review of Interventions. Research and Practice for Persons with Severe Disabilities. 2012 2012;37(4):288-307. X-5
1594. Hughes H, Combes BH, Metha SS. Managing Autism: Knowledge and Training in Autism Spectrum Disorders among Special Education Administrators in Texas. Journal of Special Education Leadership. 2012;25(2):90-8. X-5
1595. Hume K, Plavnick J, Odom SL. Promoting Task Accuracy and Independence in Students with Autism Across Educational Setting Through the Use of Individual Work Systems. J Autism Dev Disord. 2012 Feb 3PMID: 22302509; X-3
1596. Huskens B, Reijers H, Didden R. Staff training effective in increasing learning opportunities for school-aged children with autism spectrum disorders. Dev Neurorehabil. 2012;15(6):435-47. PMID: 23030785; X-3
1597. Hussein H, Shaker N, El-Sheikh M, et al. Pathways to child mental health services among patients in an urban clinical setting in Egypt. Psychiatr Serv. 2012 Dec;63(12):1225-30. PMID: 23070112; X-5
1598. Hyman SE. Revolution stalled. Sci Transl Med. 2012 Oct 10;4(155):155cm11. PMID: 23052291; X-5
1599. Ingersoll B, Meyer K, Bonter N, et al. A Comparison of Developmental Social-Pragmatic and Naturalistic Behavioral Interventions on Language Use and Social Engagement in Children with Autism. Journal of Speech, Language, and Hearing Research. 2012;55(5):1301-13. X-3
1600. Inoue K, Fukuhara H, Shimamoto T, et al. Comparison between intravesical and oral administration of 5-aminolevulinic acid in the clinical benefit of photodynamic diagnosis for nonmuscle invasive bladder cancer. Cancer. 2012 Feb 15;118(4):1062-74. PMID: 21773973; X-5
1601. Irvin DW, McBee M, Boyd BA, et al. Child and Family Factors Associated with the Use of Services for Preschoolers with Autism Spectrum Disorder. Research in Autism Spectrum Disorders. 2012;6(1):565-72. X-5
1602. Ishitobi M, Hiratani M, Kosaka H, et al. Switching to aripiprazole in subjects with pervasive developmental disorders showing tolerability issues with risperidone. Prog Neuropsychopharmacol Biol Psychiatry. 2012 Apr 27;37(1):128-31. PMID: 22245026; X-5
1603. Iwasaki S, Nishio S, Moteki H, et al. Language development in Japanese children who receive cochlear implant and/or hearing aid. Int J Pediatr Otorhinolaryngol. 2012 Mar;76(3):433-8. PMID: 22281374; X-5
1604. Iwatani Y, Kagitani-Shimono K, Tominaga K, et al. Long-term developmental outcome in patients with West syndrome after epilepsy surgery. Brain Dev. 2012 Oct;34(9):731-8. PMID: 22336751; X-5
1605. Izawa J, Pekny SE, Marko MK, et al. Motor learning relies on integrated sensory inputs in ADHD, but over-selectively on proprioception in autism spectrum conditions. Autism Res. 2012 Apr;5(2):124-36. PMID: 22359275; X-5
1606. Jameson MJ, Walker R, Utley K, et al. A Comparison of Embedded Total Task Instruction in Teaching Behavioral Chains to Massed One-on-One Instruction for Students with Intellectual Disabilities: Accessing General Education Settings and Core Academic Content. Behavior Modification. 2012;36(3):320-40. X-3, X-4
1607. Jang J, Dixon DR, Tarbox J, et al. Randomized Trial of an eLearning Program for Training Family Members of Children with Autism in the Principles and Procedures of Applied Behavior Analysis. Research in Autism Spectrum Disorders. 2012;6(2):852-6. X-4
1608. Jawaid A, Riby MD, Owens J, et al. "Too Withdrawn" or "Too Friendly": Considering Social Vulnerability in Two Neuro-Developmental Disorders. Journal of Intellectual Disability Research. 2012;56(4):335-50. X-5
1609. Johnson P, Porter K, McPherson I. Autism Knowledge among Pre-Service Teachers Specialized in Children Birth through Age Five: Implications for Health Education. American Journal of Health Education. 2012;43(5):279-87. X-5
1610. Jordan I, Robertson D, Catani M, et al. Aripiprazole in the treatment of challenging behaviour in adults with autism spectrum disorder. Psychopharmacology (Berl). 2012 Oct;223(3):357-60. PMID: 22535309; X-5
1611. Joshi G, Biederman J, Wozniak J, et al. Response to second generation antipsychotics in youth with comorbid bipolar disorder and autism spectrum disorder. CNS Neurosci Ther. 2012 Jan;18(1):28-33. PMID: 21114638; X-5
1612. Jurgens A, Anderson A, Moore DW. Parent-implemented picture exchange communication system (PECS) training: an analysis of YouTube videos. Dev Neurorehabil. 2012;15(5):351-60. PMID: 22712574; X-5

1613. Kadar M, McDonald R, Lentin P. Evidence-based practice in occupational therapy services for children with autism spectrum disorders in Victoria, Australia. Australian Occupational Therapy Journal. 2012;59(4):284-93. X-5
1614. Kagohara DM, Sigafoos J, Achmadi D, et al. Teaching Children with Autism Spectrum Disorders to Check the Spelling of Words. Research in Autism Spectrum Disorders. 2012;6(1):304-10. X-3
1615. Kagohara DM, van der Meer L, Achmadi D, et al. Teaching Picture Naming to Two Adolescents with Autism Spectrum Disorders Using Systematic Instruction and Speech-Generating Devices. Research in Autism Spectrum Disorders. 2012;6(3):1224-33. X-5
1616. Kalas A. Joint attention responses of children with autism spectrum disorder to simple versus complex music. J Music Ther. 2012 Winter;49(4):430-52. PMID: 23705346; X-5
1617. Kalb LG, Freedman B, Foster C, et al. Determinants of appointment absenteeism at an outpatient pediatric autism clinic. Journal of Developmental and Behavioral Pediatrics. 2012;33(9):685-97. X-5
1618. Kalb LG, Stuart EA, Freedman B, et al. Psychiatric-related emergency department visits among children with an autism spectrum disorder. Pediatr Emerg Care. 2012 Dec;28(12):1269-76. PMID: 23187983; X-5
1619. Kallstrand J, Nehlstedt SF, Skold ML, et al. Lateral asymmetry and reduced forward masking effect in early brainstem auditory evoked responses in schizophrenia. Psychiatry Res. 2012 Apr 30;196(2-3):188-93. PMID: 22326876; X-5
1620. Kaluzna-Czaplinska J, Blaszczyk S. The level of arabinitol in autistic children after probiotic therapy. Nutrition. 2012 Feb;28(2):124-6. PMID: 22079796; X-4
1621. Kan MW, Leung LH, Yu PK. Verification and dosimetric impact of Acuros XB algorithm on intensity modulated stereotactic radiotherapy for locally persistent nasopharyngeal carcinoma. Med Phys. 2012 Aug;39(8):4705-14. PMID: 22894395; X-5
1622. Karst JS, Van Hecke AV. Parent and Family Impact of Autism Spectrum Disorders: A Review and Proposed Model for Intervention Evaluation. Clinical Child and Family Psychology Review. 2012;15(3):247-77. X-5
1623. Kaslow NJ, Broth MR, Smith CO, et al. Family-Based Interventions for Child and Adolescent Disorders. Journal of Marital and Family Therapy. 2012;38(1):82-100. X-2, X-5
1624. Katsnelson A. The autism pill. Sci Am. 2012 Nov;307(5):16. PMID: 23120883; X-5
1625. Kehle TJ, Bray MA, Byer-Alcorace GF, et al. Augmented Self-Modeling as an Intervention for Selective Mutism. Psychology in the Schools. 2012;49(1):93-103. X-1, X-3, X-4
1626. Kellems RO, Morningstar ME. Using video modeling delivered through ipods to teach vocational tasks to young adults with autism spectrum disorders. Career Development and Transition for Exceptional Individuals. 2012;35(3):155-67. X-5
1627. Khanna R, Jariwala K. Awareness and knowledge of autism among pharmacists. Res Social Adm Pharm. 2012 Sep-Oct;8(5):464-71. PMID: 22222344; X-5
1628. Khanna R, Madhavan SS, Smith MJ, et al. Psychometric properties of the Caregiver Strain Questionnaire (CGSQ) among caregivers of children with autism. Autism. 2012 Mar;16(2):179-99. PMID: 21715548; X-5
1629. Kheir NM, Ghoneim OM, Sandridge AL, et al. Concerns and considerations among caregivers of a child with autism in Qatar. BMC Res Notes. 2012;5:290. PMID: 22695064; X-5
1630. Kieffer V, Longaud A, Callu D, et al. Teachers' report of learning and behavioural difficulties in children treated for cerebellar tumours. Brain Inj. 2012;26(7-8):1014-20. PMID: 22571388; X-5
1631. Kim JJ, Freeman SF, Paparella T, et al. Five-Year Follow-up of Preschoolers with Autism and Comorbid Psychiatric Disorders. Behavioral Disorders. 2012 November 2012;38(1):57-70. X-5
1632. Kinnealey M, Pfeiffer B, Miller J, et al. Effect of classroom modification on attention and engagement of students with autism or dyspraxia. Am J Occup Ther. 2012 Sep-Oct;66(5):511-9. PMID: 22917117; X-5
1633. Klett LS, Turan Y. Generalized effects of social stories with task analysis for teaching menstrual care to three young girls with autism. Sexuality and Disability. 2012;30(3):319-36. X-3
1634. Klintwall L, Eikeseth S. Number and Controllability of Reinforcers as Predictors of Individual Outcome for Children with Autism Receiving Early and Intensive Behavioral Intervention: A Preliminary Study. Research in Autism Spectrum Disorders. 2012;6(1):493-9. X-5
1635. Klintwall L, Gillberg C, Bölte S, et al. The efficacy of intensive behavioral intervention for children with autism: A matter of allegiance? Journal of Autism and Developmental Disorders. 2012;42(1):139-40. X-4
1636. Klose LM, Plotts C, Kozeneski N, et al. A Review of Assessment Tools for Diagnosis of Autism Spectrum Disorders: Implications for School Practice. Assessment for Effective Intervention. 2012;37(4):236-42. X-5
1637. Knox M, Rue HC, Wildenger L, et al. Intervention for Food Selectivity in a Specialized School Setting: Teacher Implemented Prompting, Reinforcement, and Demand Fading for an Adolescent Student with Autism. Education and Treatment of Children. 2012;35(3):407-17. X-5

1638. Kocovska E, Fernell E, Billstedt E, et al. Vitamin D and Autism: Clinical Review. Elsevier. 6277 Sea Harbor Drive, Orlando, FL 32887-4800.; 2012. p. 1541-50. X-4
1639. Kodak T, Fuchtman R, Paden A. A Comparison of Intraverbal Training Procedures for Children with Autism. Journal of Applied Behavior Analysis. 2012;45(1):155-60. X-3
1640. Koegel L, Matos-Freden R, Lang R, et al. Interventions for Children with Autism Spectrum Disorders in Inclusive School Settings. Cognitive and Behavioral Practice. 2012;19(3):401-12. X-1, X-2, X-3, X-4
1641. Koegel LK, Kuriakose S, Singh AK, et al. Improving generalization of peer socialization gains in inclusive school settings using initiations training. Behav Modif. 2012 May;36(3):361-77. PMID: 22645399; X-3
1642. Koegel RL, Bharoocha AA, Ribnick CB, et al. Using individualized reinforcers and hierarchical exposure to increase food flexibility in children with autism spectrum disorders. J Autism Dev Disord. 2012 Aug;42(8):1574-81. PMID: 22042309; X-3
1643. Koegel RL, Fredeen R, Kim S, et al. Using Perseverative Interests to Improve Interactions between Adolescents with Autism and Their Typical Peers in School Settings. Journal of Positive Behavior Interventions. 2012;14(3):133-41. X-5
1644. Koenig KP, Buckley-Reen A, Garg S. Efficacy of the Get Ready to Learn yoga program among children with autism spectrum disorders: a pretest-posttest control group design. Am J Occup Ther. 2012 Sep-Oct;66(5):538-46. PMID: 22917120; X-5
1645. Kooistra ET, Buchmeier AL, Klatt KP. The effect of motivating operations on the transfer from tacts to mands for children diagnosed with autism. Research in Autism Spectrum Disorders. 2012;6(1):109-14. X-3
1646. Kosaka H, Munesue T, Ishitobi M, et al. Long-term oxytocin administration improves social behaviors in a girl with autistic disorder. BMC Psychiatry. 2012; X-5
1647. Kossyvaki L, Jones G, Guldberg K. The Effect of Adult Interactive Style on the Spontaneous Communication of Young Children with Autism at School. British Journal of Special Education. 2012;39(4):173-84. X-3
1648. Koucky EM, Galovski TE, Nixon RD. Acute Stress Disorder: Conceptual Issues and Treatment Outcomes. Cognitive and Behavioral Practice. 2012;19(3):437-50. X-5
1649. Kozlowski AM, Matson JL, Worley JA, et al. Defining Characteristics for Young Children Meeting Cutoff on the Modified Checklist for Autism in Toddlers. Research in Autism Spectrum Disorders. 2012;6(1):472-9. X-5
1650. Kramer JM, Coster WJ, Kao YC, et al. A new approach to the measurement of adaptive behavior: development of the PEDI-CAT for children and youth with autism spectrum disorders. Phys Occup Ther Pediatr. 2012 Feb;32(1):34-47. PMID: 21846290; X-5
1651. Krieger B, Kinebanian A, Prodinger B, et al. Becoming a member of the work force: perceptions of adults with Asperger Syndrome. Work. 2012;43(2):141-57. PMID: 22927626; X-5
1652. Krizman J, Skoe E, Kraus N. Sex differences in auditory subcortical function. Clin Neurophysiol. 2012 Mar;123(3):590-7. PMID: 21855407; X-5
1653. Kuhn M, Grave S, Bransfield R, et al. Long term antibiotic therapy may be an effective treatment for children co-morbid with Lyme disease and autism spectrum disorder. Med Hypotheses. 2012 May;78(5):606-15. PMID: 22361005; X-3, X-4, X-5
1654. Kuppens S, Onghena P. Sequential Meta-Analysis to Determine the Sufficiency of Cumulative Knowledge: The Case of Early Intensive Behavioral Intervention for Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2012;6(1):168-76. X-5
1655. Lajonchere C, Jones N, Coury DL, et al. Leadership in health care, research, and quality improvement for children and adolescents with autism spectrum disorders: Autism Treatment Network and Autism Intervention Research Network on Physical Health. Pediatrics. 2012 Nov;130 Suppl 2:S62-8. PMID: 23118255; X-2, X-3, X-4
1656. Lane SJ, Reynolds S, Dumenci L. Sensory overresponsivity and anxiety in typically developing children and children with autism and attention deficit hyperactivity disorder: cause or coexistence? Am J Occup Ther. 2012 Sep-Oct;66(5):595-603. PMID: 22917126; X-5
1657. Lang R, O'Reilly M, Healy O, et al. Sensory Integration Therapy for Autism Spectrum Disorders: A Systematic Review. Research in Autism Spectrum Disorders. 2012;6(3):1004-18. X-5
1658. Lanovaz MJ, Rapp JT, Ferguson S. The Utility of Assessing Musical Preference before Implementation of Noncontingent Music to Reduce Vocal Stereotypy. Journal of Applied Behavior Analysis. 2012;45(4):845-51. X-3
1659. Lanovaz MJ, Sladeczek IE. Vocal Stereotypy in Individuals with Autism Spectrum Disorders: A Review of Behavioral Interventions. Behavior Modification. 2012 March 2012;36(2):146-64. X-2
1660. Larsson PG, Bakke KA, Bjornaes H, et al. The effect of levetiracetam on focal nocturnal epileptiform activity during sleep--a placebo-controlled double-blind cross-over study. Epilepsy Behav. 2012 May;24(1):44-8. PMID: 22494796; X-5

1661. Laugeson EA, Frankel F, Gantman A, et al. Evidence-based social skills training for adolescents with autism spectrum disorders: the UCLA PEERS program. J Autism Dev Disord. 2012 Jun;42(6):1025-36. PMID: 21858588; X-5
1662. Laws G, Bates G, Feuerstein M, et al. Peer Acceptance of Children with Language and Communication Impairments in a Mainstream Primary School: Associations with Type of Language Difficulty, Problem Behaviours and a Change in Placement Organization. Child Language Teaching and Therapy. 2012;28(1):73-86. X-5
1663. Leaf JB, Oppenheim-Leaf ML, Call NA, et al. Comparing the Teaching Interaction Procedure to Social Stories for People with Autism. Journal of Applied Behavior Analysis. 2012;45(2):281-98. X-3
1664. Leaf JB, Oppenheim-Leaf ML, Leaf R, et al. Observational Effects on the Preferences of Children with Autism. Journal of Applied Behavior Analysis. 2012;45(3):473-83. X-3, X-4
1665. Lee MS, Choi T-Y, Shin B-C, et al. Acupuncture for Children with Autism Spectrum Disorders: A Systematic Review of Randomized Clinical Trials. Journal of Autism and Developmental Disorders. 2012;42(8):1671-83. X-5
1666. Lemonnier E, Degrez C, Phelep M, et al. A randomised controlled trial of bumetanide in the treatment of autism in children. Transl Psychiatry. 2012;2:e202. PMID: 23233021; X-5
1667. Lennertz L, Wagner M, Wolwer W, et al. A promoter variant of SHANK1 affects auditory working memory in schizophrenia patients and in subjects clinically at risk for psychosis. Eur Arch Psychiatry Clin Neurosci. 2012 Mar;262(2):117-24. PMID: 21901269; X-5
1668. Lerna A, Esposito D, Conson M, et al. Social-communicative effects of the Picture Exchange Communication System (PECS) in autism spectrum disorders. Int J Lang Commun Disord. 2012 Sep-Oct;47(5):609-17. PMID: 22938071; X-5
1669. Leroi I, McDonald K, Pantula H, et al. Cognitive impairment in Parkinson disease: impact on quality of life, disability, and caregiver burden. J Geriatr Psychiatry Neurol. 2012 Dec;25(4):208-14. PMID: 23172765; X-5
1670. Lian WB, Ho SK, Choo SH, et al. Children with developmental and behavioural concerns in Singapore. Singapore Med J. 2012 Jul;53(7):439-45. PMID: 22815011; X-5
1671. Lickel A, MacLean WE, Jr., Blakeley-Smith A, et al. Assessment of the prerequisite skills for cognitive behavioral therapy in children with and without autism spectrum disorders. J Autism Dev Disord. 2012 Jun;42(6):992-1000. PMID: 21818677; X-4
1672. Lieberman RG, Yoder P. Play and Communication in Children with Autism Spectrum Disorder: A Framework for Early Intervention. Journal of Early Intervention. 2012;34(2):82-103. X-2, X-5
1673. Lin LY, Yu SN, Yu YT. A study of activities of daily living and employment in adults with autism spectrum disorders in Taiwan. Int J Rehabil Res. 2012 Jun;35(2):109-15. PMID: 22334003; X-5
1674. Lindberg N, Sailas E, Kaltiala-Heino R. The copycat phenomenon after two Finnish school shootings: an adolescent psychiatric perspective. BMC Psychiatry. 2012;12:91. PMID: 22839726; X-5
1675. Lindberg S, von Post I, Eriksson K. The experiences of parents of children with severe autism in connection with their children's anaesthetics, in the presence and absence of the perioperative dialogue: A hermeneutic study. Scandinavian Journal of Caring Sciences. 2012;26(4):627-34. X-5
1676. Ling CY, Mak WW. Coping with challenging behaviours of children with autism: effectiveness of brief training workshop for frontline staff in special education settings. J Intellect Disabil Res. 2012 Mar;56(3):258-69. PMID: 21955252; X-5
1677. Lit L, Sharp FR, Bertoglio K, et al. Gene expression in blood is associated with risperidone response in children with autism spectrum disorders. Pharmacogenomics J. 2012 Oct;12(5):368-71. PMID: 21647175; X-5
1678. Lo SY. Diagnosis, treatment and prevention of autism via meridian theory. Am J Chin Med. 2012;40(1):39-56. PMID: 22298447; X-3, X-4
1679. Locke J, Rotheram-Fuller E, Kasari C. Exploring the Social Impact of Being a Typical Peer Model for d Children with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders. 2012;42(9):1895-905. X-1, X-3, X-4
1680. Logan SL, Nicholas JS, Carpenter LA, et al. High prescription drug use and associated costs among Medicaid-eligible children with autism spectrum disorders identified by a population-based surveillance network. Ann Epidemiol. 2012 Jan;22(1):1-8. PMID: 22153288; X-5
1681. Lokhandwala T, Khanna R, West-Strum D. Hospitalization burden among individuals with autism. J Autism Dev Disord. 2012 Jan;42(1):95-104. PMID: 21404084; X-5
1682. Lopata C, Thomeer ML, Volker MA, et al. Feasibility and Initial Efficacy of a Comprehensive School-Based Intervention for High-Functioning Autism Spectrum Disorders. Psychology in the Schools. 2012;49(10):963-74. X-5

1683. Lopatina O, Inzhutova A, Salmina AB, et al. The roles of oxytocin and CD38 in social or parental behaviors. Front Neurosci. 2012;6:182. PMID: 23335873; X-5
1684. Lopez M, Bellando J. An informal survey on family/caregiver wishes for individuals with autism in Arkansas. J Ark Med Soc. 2012 Dec;109(7):137-9. PMID: 23304848; X-5
1685. Lopez M, Schulz EG, Baroud T, et al. The Arkansas Autism Developmental Disabilities Monitoring (AR ADDM) project: statewide autism surveillance in a rural state. J Ark Med Soc. 2012 Mar;108(10):220, 2-4. PMID: 22479981; X-5
1686. Love JJ, Miguel CF, Fernand JK, et al. The effects of matched stimulation and response interruption and redirection on vocal stereotypy. Journal of Applied Behavior Analysis. 2012;45(3):549-64. X-3
1687. Lovell B, Moss M, Wetherell M. The psychosocial, endocrine and immune consequences of caring for a child with autism or ADHD. Psychoneuroendocrinology. 2012 Apr;37(4):534-42. PMID: 21889267; X-5
1688. Lovell B, Moss M, Wetherell MA. With a Little Help from My Friends: Psychological, Endocrine and Health Corollaries of Social Support in Parental Caregivers of Children with Autism or ADHD. Research in Developmental Disabilities: A Multidisciplinary Journal. 2012;33(2):682-7. X-5
1689. LoVullo SV, Matson JL. Development of a Critical Item Algorithm for the Baby and Infant Screen for Children with aUtIsm Traits. Research in Autism Spectrum Disorders. 2012;6(1):378-84. X-5
1690. Lowdermilk J, Martinez D, Pecina J, et al. Behavior Breakthroughs[TM]: Future Teachers Reflect on a Focused Game Designed to Teach ABA Techniques. TechTrends: Linking Research and Practice to Improve Learning. 2012;56(3):29-35. X-1, X-3, X-4
1691. Luman M, van Meel CS, Oosterlaan J, et al. Reward and Punishment Sensitivity in Children with ADHD: Validating the Sensitivity to Punishment and Sensitivity to Reward Questionnaire for Children (SPSRQ-C). Journal of Abnormal Child Psychology. 2012;40(1):145-57. X-5
1692. Lutz HR, Patterson BJ, Klein J. Coping with autism: a journey toward adaptation. J Pediatr Nurs. 2012 Jun;27(3):206-13. PMID: 22525808; X-5
1693. Lyall K, Pauls DL, Spiegelman D, et al. Fertility therapies, infertility and autism spectrum disorders in the Nurses' Health Study II. Paediatr Perinat Epidemiol. 2012 Jul;26(4):361-72. PMID: 22686388; X-5
1694. MacDonald M, Esposito P, Hauck J, et al. Bicycle Training for Youth with Down Syndrome and Autism Spectrum Disorders. Focus on Autism and Other Developmental Disabilities. 2012;27(1):12-21. X-1, X-3, X-4
1695. Mackintosh VH, Goin-Kochel RP, Myers BJ. "What Do You Like/Dislike about the Treatments You're Currently Using?": A Qualitative Study of Parents of Children with Autism Spectrum Disorders. Focus on Autism and Other Developmental Disabilities. 2012;27(1):51-60. X-5
1696. Madaus MR, Ruberto LM. Application of Self-Modeling to Externalizing and Internalizing Disorders. Psychology in the Schools. 2012;49(1):42-51. X-2, X-3, X-4, X-5
1697. Magana S, Parish SL, Rose RA, et al. Racial and ethnic disparities in quality of health care among children with autism and other developmental disabilities. Intellect Dev Disabil. 2012 Aug;50(4):287-99. PMID: 22861130; X-3, X-4, X-5
1698. Magyar CI, Pandolfi V. Considerations for Establishing a Multi-Tiered Problem-Solving Model for Students with Autism Spectrum Disorders and Comorbid Emotional-Behavioral Disorders. Psychology in the Schools. 2012;49(10):975-87. X-1, X-2, X-3, X-4
1699. Mahdavi SR, Rezaeejam H, Shirazi A, et al. Conformal fields in prostate radiotherapy: a comparison between measurement, calculation and simulation. J Cancer Res Ther. 2012 Jan-Mar;8(1):34-9. PMID: 22531511; X-5
1700. Maich K, Belcher CE. Using Picture Books to Create Peer Awareness about Autism Spectrum Disorders in the Inclusive Classroom. Intervention in School and Clinic. 2012;47(4):206-13. X-2, X-5
1701. Maiello S. Prenatal Experiences of Containment in the Light of Bion's Model of Container/Contained. Journal of Child Psychotherapy. 2012;38(3):250-67. X-5
1702. Malow B, Adkins KW, McGrew SG, et al. Melatonin for sleep in children with autism: a controlled trial examining dose, tolerability, and outcomes. J Autism Dev Disord. 2012 Aug;42(8):1729-37; author reply 38. PMID: 22160300; X-5
1703. Malow BA, Byars K, Johnson K, et al. A practice pathway for the identification, evaluation, and management of insomnia in children and adolescents with autism spectrum disorders. Pediatrics. 2012 Nov;130 Suppl 2:S106-24. PMID: 23118242; X-5
1704. Mandell DS. Understanding and addressing the impact of autism on the family. LDI Issue Brief. 2012 Apr-May;17(7):1-4. PMID: 22666896; X-5
1705. Mandell DS, Xie M, Morales KH, et al. The interplay of outpatient services and psychiatric hospitalization among Medicaid-enrolled children with autism spectrum disorders. Arch Pediatr Adolesc Med. 2012 Jan;166(1):68-73. PMID: 22213753; X-5

1706. Marchese NV, Carr JE, LeBlanc LA, et al. The effects of the question "What is this?" on tact-training outcomes of children with autism. Journal of Applied Behavior Analysis. 2012;45(3):539-47. X-3
1707. Marion C, Martin GL, Yu CT, et al. Teaching children with autism spectrum disorder to mand for information using "which?". J Appl Behav Anal. 2012 Winter;45(4):865-70. PMID: 23322944; X-3
1708. Marsanic VB, Dodig-Curkovic K, Juretic Z. Outpatient treatment of children and adolescents with antipsychotic drugs in Croatia. Nord J Psychiatry. 2012 Feb;66(1):2-7. PMID: 21306199; X-5
1709. Marshall K, Ferris J. Utilising behavioural family therapy (BFT) to help support the system around a person with intellectual disability and complex mental health needs: A case study. Journal of Intellectual Disabilities. 2012;16(2):109-18. X-5
1710. Marsteller TM, St. Peter CC. Resurgence during treatment challenges. Revista Mexicana de Análisis de la Conducta. 2012;38(1):7-23. X-3
1711. Martinez-Rovira I, Sempau J, Prezado Y. Development and commissioning of a Monte Carlo photon beam model for the forthcoming clinical trials in microbeam radiation therapy. Med Phys. 2012 Jan;39(1):119-31. PMID: 22225281; X-5
1712. Mashal N, Kasirer A. Principal component analysis study of visual and verbal metaphoric comprehension in children with autism and learning disabilities. Res Dev Disabil. 2012 Jan-Feb;33(1):274-82. PMID: 22001558; X-5
1713. Mason RA, Rispoli M, Ganz JB, et al. Effects of video modeling on communicative social skills of college students with Asperger syndrome. Dev Neurorehabil. 2012;15(6):425-34. PMID: 23030681; X-5
1714. Masschelein J, Verstraete P. Living in the Presence of Others: Towards a Reconfiguration of Space, Asylum and Inclusion. International Journal of Inclusive Education. 2012;16(11):1189-202. X-5
1715. Matone M, Localio R, Huang YS, et al. The relationship between mental health diagnosis and treatment with second-generation antipsychotics over time: a national study of U.S. Medicaid-enrolled children. Health Serv Res. 2012 Oct;47(5):1836-60. PMID: 22946905; X-5
1716. Matson JL, Hattier MA, Belva B. Treating Adaptive Living Skills of Persons with Autism Using Applied Behavior Analysis: A Review. Research in Autism Spectrum Disorders. 2012;6(1):271-6. X-1, X-2, X-3, X-4, X-5
1717. Matson JL, Tureck K. Early Diagnosis of Autism: Current Status of the Baby and Infant Screen for Children with aUtIsm Traits (BISCUIT-Parts 1, 2, and 3). Research in Autism Spectrum Disorders. 2012;6(3):1135-41. X-5
1718. Matson JL, Tureck K, Turygin N, et al. Trends and Topics in Early Intensive Behavioral Interventions for Toddlers with Autism. Research in Autism Spectrum Disorders. 2012;6(4):1412-7. X-5
1719. Matson JL, Turygin NC, Beighley J, et al. Status of Single-Case Research Designs for Evidence-Based Practice. Research in Autism Spectrum Disorders. 2012;6(2):931-8. X-5
1720. Matson JL, Turygin NC, Beighley J, et al. Applied Behavior Analysis in Autism Spectrum Disorders: Recent Developments, Strengths, and Pitfalls. Research in Autism Spectrum Disorders. 2012;6(1):144-50. X-1, X-2, X-3, X-4, X-5
1721. Matsuzaki A, Yamamoto J-i. Effects of an early intervention program on preverbal communication in a child with autism: Developmental and behavioral analysis with a multiple-baseline design. Japanese Journal of Special Education. 2012;49(6):657-69. X-3
1722. Matsuzaki J, Kagitani-Shimono K, Goto T, et al. Differential responses of primary auditory cortex in autistic spectrum disorder with auditory hypersensitivity. Neuroreport. 2012 Jan 25;23(2):113-8. PMID: 22146579; X-5
1723. May ME, Brandt RC, Bohannan JK. Moderating Effects of Autism on Parent Views of Genetic Screening for Aggression. Intellectual and Developmental Disabilities. 2012 October 2012;50(5):415-25. X-5
1724. Mayor S. Advertising watchdog orders website to remove claims linking MMR vaccine with autism. BMJ. 2012;345:e5420. PMID: 22879643; X-5
1725. Mazurek MO, Kanne SM, Miles JH. Predicting Improvement in Social-Communication Symptoms of Autism Spectrum Disorders Using Retrospective Treatment Data. Research in Autism Spectrum Disorders. 2012;6(1):535-45. X-5
1726. McClean B, Grey I. An evaluation of an intervention sequence outline in positive behaviour support for people with autism and severe escape-motivated challenging behaviour. J Intellect Dev Disabil. 2012 Sep;37(3):209-20. PMID: 22873574; X-3, X-5
1727. McCrimmon AW, Altomare AA, Matchullis RL, et al. School-Based Practices for Asperger Syndrome: A Canadian Perspective. Canadian Journal of School Psychology. 2012;27(4):319-36. X-5
1728. McDonald ME, Pace D, Blue E, et al. Critical Issues in Causation and Treatment of Autism: Why Fads Continue to Flourish. Child & Family Behavior Therapy. 2012;34(4):290-304. X-5
1729. McDuffie AS, Lieberman RG, Yoder PJ. Object interest in autism spectrum disorder: a treatment comparison. Autism. 2012 Jul;16(4):398-405. PMID: 22133872; X-5

1730. McGill P, Poynter J. High cost residential placements for adults with intellectual disabilities. J Appl Res Intellect Disabil. 2012 Nov;25(6):584-7. PMID: 23055291; X-5
1731. McGrew SG, Peters BR, Crittendon JA, et al. Diagnostic yield of chromosomal microarray analysis in an autism primary care practice: Which guidelines to implement? Journal of Autism and Developmental Disorders. 2012;42(8):1582-91. X-5
1732. McGuinty E, Armstrong D, Nelson J, et al. Externalizing metaphors: anxiety and high-functioning autism. J Child Adolesc Psychiatr Nurs. 2012 Feb;25(1):9-16. PMID: 22299802; X-5
1733. MdYusof MSB, Chia NKH. Dolphin Encounter for Special Children (DESC) Program: Effectiveness of Dolphin-Assisted Therapy for Children with Autism. International Journal of Special Education. 2012 2012;27(3):54-67. X-5
1734. Mechling LC, Youhouse IR. Comparison of Task Performance by Students with Autism and Moderate Intellectual Disabilities when Presenting Video Models on Large and Small Screen Sizes. Journal of Special Education Technology. 2012 2012;27(1):1-14. X-3, X-5
1735. Medeiros K, Kozlowski AM, Beighley JS, et al. The Effects of Developmental Quotient and Diagnostic Criteria on Challenging Behaviors in Toddlers with Developmental Disabilities. Research in Developmental Disabilities: A Multidisciplinary Journal. 2012;33(4):1110-6. X-5
1736. Meier AE, Fryling MJ, Wallace MD. Using high-probability foods to increase the acceptance of low-probability foods. J Appl Behav Anal. 2012 Spring;45(1):149-53. PMID: 22403458; X-3, X-5
1737. Melogno S, D'Ardia C, Pinto MA, et al. Metaphor Comprehension in Autistic Spectrum Disorders: Case Studies of Two High-Functioning Children. Child Language Teaching and Therapy. 2012;28(2):177-88. X-3
1738. Memari AH, Kordi R, Ziaee V, et al. Weight status in Iranian children with autism spectrum disorders: Investigation of underweight, overweight and obesity. Research in Autism Spectrum Disorders. 2012;6(1):234-9. X-5
1739. Memari AH, Ziaee V, Beygi S, et al. Overuse of psychotropic medications among children and adolescents with autism spectrum disorders: perspective from a developing country. Res Dev Disabil. 2012 Mar-Apr;33(2):563-9. PMID: 22119705; X-3, X-4, X-5
1740. Migliore A, Timmons J, Butterworth J, et al. Predictors of employment and postsecondary education of youth with autism. Rehabilitation Counseling Bulletin. 2012;55(3):176-84. X-5
1741. Milas M, Mester J, Metzger R, et al. Should patients with Cowden syndrome undergo prophylactic thyroidectomy? Surgery. 2012 Dec;152(6):1201-10. PMID: 23158187; X-5
1742. Miliotis A, Sidener TM, Reeve KF, et al. An evaluation of the number of presentations of target sounds during stimulus-stimulus pairing trials. J Appl Behav Anal. 2012 Winter;45(4):809-13. PMID: 23322934; X-3
1743. Miller E. Focusing on prevention. Imprint. 2012 Nov-Dec;59(5):12. PMID: 23409627; X-5
1744. Miller VA, Schreck KA, Mulick JA, et al. Factors related to parents' choices of treatments for their children with autism spectrum disorders. Research in Autism Spectrum Disorders. 2012;6(1):87-95. X-5
1745. Mims PJ, Hudson ME, Browder DM. Using Read-Alouds of Grade-Level Biographies and Systematic Prompting to Promote Comprehension for Students with Moderate and Severe Developmental Disabilities. Focus on Autism and Other Developmental Disabilities. 2012;27(2):67-80. X-3
1746. Minne EP, Semrud-Clikeman M. A Social Competence Intervention for Young Children with High Functioning Autism and Asperger Syndrome: A Pilot Study. Autism: The International Journal of Research and Practice. 2012;16(6):586-602. X-3, X-4
1747. Miyaoka T, Wake R, Furuya M, et al. Yokukansan (TJ-54) for treatment of pervasive developmental disorder not otherwise specified and Asperger's disorder: A 12-week prospective, open-label study. BMC Psychiatry. 2012;12. X-3, X-5
1748. Moody AK. Family Connections: Visual Supports for Promoting Social Skills in Young Children--A Family Perspective. Childhood Education. 2012;88(3):191-4. X-1, X-2, X-3, X-4
1749. Morgan PL, Sideridis G, Hua Y. Initial and Over-Time Effects of Fluency Interventions for Students with or at Risk for Disabilities. Journal of Special Education. 2012;46(2):94-116. X-1, X-3, X-4
1750. Morrier MJ, Hess KL. Ethnic Differences in Autism Eligibility in the United States Public Schools. Journal of Special Education. 2012;46(1):49-63. X-5
1751. Morrison RD, Blobaum AL, Byers FW, et al. The role of aldehyde oxidase and xanthine oxidase in the biotransformation of a novel negative allosteric modulator of metabotropic glutamate receptor subtype 5. Drug Metab Dispos. 2012 Sep;40(9):1834-45. PMID: 22711749; X-5
1752. Murphy D, Spooren W. EU-AIMS: a boost to autism research. Nat Rev Drug Discov. 2012 Nov;11(11):815-6. PMID: 23123927; X-5

1753. Najdowski AC, Tarbox J, Wilke AE. Utilizing Antecedent Manipulations and Reinforcement in the Treatment of Food Selectivity by Texture. Education and Treatment of Children. 2012;35(1):101-10. X-3
1754. Neely J, Amatea ES, Echevarria-Doan S, et al. Working with families living with autism: potential contributions of marriage and family therapists. J Marital Fam Ther. 2012 Jun;38 Suppl 1:211-26. PMID: 22765335; X-5
1755. Nicholson MS, Leask J. Lessons from an online debate about measles-mumps-rubella (MMR) immunization. Vaccine. 2012 May 28;30(25):3806-12. PMID: 22063388; X-5
1756. Novarino G, El-Fishawy P, Kayserili H, et al. Mutations in BCKD-kinase lead to a potentially treatable form of autism with epilepsy. Science. 2012 Oct 19;338(6105):394-7. PMID: 22956686; X-5
1757. Nygren G, Sandberg E, Gillstedt F, et al. A New Screening Programme for Autism in a General Population of Swedish Toddlers. Research in Developmental Disabilities: A Multidisciplinary Journal. 2012;33(4):1200-10. X-5
1758. Oberman L, Eldaief M, Fecteau S, et al. Abnormal modulation of corticospinal excitability in adults with Asperger's syndrome. Eur J Neurosci. 2012 Sep;36(6):2782-8. PMID: 22738084; X-5
1759. Obrusnikova I, Bibik JM, Cavalier AR, et al. Integrating Therapy Dog Teams in a Physical Activity Program for Children with Autism Spectrum Disorders. Journal of Physical Education, Recreation & Dance. 2012;83(6):37-41. X-1, X-2, X-3, X-4
1760. O'Connor K. Auditory processing in autism spectrum disorder: a review. Neurosci Biobehav Rev. 2012 Feb;36(2):836-54. PMID: 22155284; X-5
1761. Odluyurt S, Tekin-Iftar E, Adalioglu I. Does treatment integrity matter in promoting learning among children with developmental disabilities? Topics in Early Childhood Special Education. 2012;32(3):143-50. X-3
1762. Odom S, Hume K, Boyd B, et al. Moving beyond the Intensive Behavior Treatment versus Eclectic Dichotomy: Evidence-Based and Individualized Programs for Learners with ASD. Behavior Modification. 2012;36(3):270-97. X-1, X-2, X-3, X-4
1763. Ogletree BT, Davis P, Hambrecht G, et al. Using milieu training to promote photograph exchange for a young child with autism. Focus on Autism and Other Developmental Disabilities. 2012;27(2):93-101. X-3
1764. Ohashi KJ, Mirenda P, Marinova-Todd S, et al. Comparing Early Language Development in Monolingual- and Bilingual- Exposed Young Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2012;6(2):890-7. X-5
1765. O'Reilly M, Aguilar J, Fragale C, et al. Effects of a Motivating Operation Manipulation on the Maintenance of Mands. Journal of Applied Behavior Analysis. 2012;45(2):443-7. X-3
1766. O'Reilly M, Cook L, Karim K. Complementary or controversial care? The opinions of professionals on complementary and alternative interventions for Autistic Spectrum Disorder. Clin Child Psychol Psychiatry. 2012 Oct;17(4):602-15. PMID: 22371629; X-5
1767. O'Reilly M, Fragale C, Gainey S, et al. Examination of an antecedent communication intervention to reduce tangibly maintained challenging behavior: a controlled analog analysis. Res Dev Disabil. 2012 Sep-Oct;33(5):1462-8. PMID: 22543058; X-3
1768. Orekhova EV, Tsetlin MM, Butorina AV, et al. Auditory cortex responses to clicks and sensory modulation difficulties in children with autism spectrum disorders (ASD). PLoS One. 2012;7(6):e39906. PMID: 22768163; X-5
1769. Orellana LM, Silvestre FJ, Martinez-Sanchis S, et al. Oral manifestations in a group of adults with autism spectrum disorder. Med Oral Patol Oral Cir Bucal. 2012 May;17(3):e415-9. PMID: 22143726; X-5
1770. Osiecka B, Jurczyszyn K, Ziolkowski P. The application of Levulan-based photodynamic therapy with imiquimod in the treatment of recurrent basal cell carcinoma. Med Sci Monit. 2012 Feb;18(2):PI5-9. PMID: 22293891; X-5
1771. Ostmeyer K, Scarpa A. Examining School-Based Social Skills Program Needs and Barriers for Students with High-Functioning Autism Spectrum Disorders Using Participatory Action Research. Psychology in the Schools. 2012;49(10):932-41. X-5
1772. Ozsivadjian A, Knott F, Magiati I. Parent and child perspectives on the nature of anxiety in children and young people with autism spectrum disorders: a focus group study. Autism. 2012 Mar;16(2):107-21. PMID: 22297200; X-5
1773. Paden AR, Kodak T, Fisher WW, et al. Teaching Children with Autism to Engage in Peer-Directed Mands Using a Picture Exchange Communication System. Journal of Applied Behavior Analysis. 2012;45(2):425-9. X-3
1774. Pajareya K, Nopmaneejumruslers K. A one-year prospective follow-up study of a DIR/Floortime parent training intervention for pre-school children with autistic spectrum disorders. J Med Assoc Thai. 2012 Sep;95(9):1184-93. PMID: 23140036; X-5

1775. Palmen A, Didden R. Task Engagement in Young Adults with High-Functioning Autism Spectrum Disorders: Generalization Effects of Behavioral Skills Training. Research in Autism Spectrum Disorders. 2012;6(4):1377-88. X-5
1776. Palmen A, Didden R, Lang R. A Systematic Review of Behavioral Intervention Research on Adaptive Skill Building in High-Functioning Young Adults with Autism Spectrum Disorder. Research in Autism Spectrum Disorders. 2012;6(2):602-17. X-5
1777. Palmen A, Didden R, Verhoeven L. A personal digital assistant for improving independent transitioning in adolescents with high-functioning autism spectrum disorder. Dev Neurorehabil. 2012;15(6):401-13. PMID: 23030628; X-5
1778. Pardini M, Elia M, Garaci FG, et al. Long-term cognitive and behavioral therapies, combined with augmentative communication, are related to uncinate fasciculus integrity in autism. J Autism Dev Disord. 2012 Apr;42(4):585-92. PMID: 21573693; X-1, X-3, X-4
1779. Parish S, Magana S, Rose R, et al. Health Care of Latino Children with Autism and Other Developmental Disabilities: Quality of Provider Interaction Mediates Utilization. American Journal on Intellectual and Developmental Disabilities. 2012;117(4):304-15. X-5
1780. Parish S, Thomas K, Rose R, et al. State insurance parity legislation for autism services and family financial burden. Intellect Dev Disabil. 2012 Jun;50(3):190-8. PMID: 22731968; X-5
1781. Park HY, Lin SC, Harwood RL, et al. Autism Intervention Research Programs of the Maternal and Child Health Bureau. Pediatrics. 2012 Nov;130 Suppl 2:S59-61. PMID: 23118254; X-1, X-2, X-3, X-4
1782. Park M. Pleasure, throwing breaches, and embodied metaphors: Tracing transformations-in-participation for a child with autism to a sensory integration-based therapy session. OTJR: Occupation, Participation and Health. 2012;32(Suppl 1):S34-S47. X-3
1783. Patterson SY, Smith V, Mirenda P. A Systematic Review of Training Programs for Parents of Children with Autism Spectrum Disorders: Single Subject Contributions. Autism: The International Journal of Research and Practice. 2012;16(5):498-522. X-5
1784. Peacock G, Lin SC. Enhancing early identification and coordination of intervention services for young children with autism spectrum disorders: report from the Act Early Regional Summit Project. Disabil Health J. 2012 Jan;5(1):55-9. PMID: 22226299; X-5
1785. Pearson DA, Aman MG, Arnold LE, et al. High concordance of parent and teacher attention-deficit/hyperactivity disorder ratings in medicated and unmedicated children with autism spectrum disorders. J Child Adolesc Psychopharmacol. 2012 Aug;22(4):284-91. PMID: 22849541; X-5
1786. Pearson GS. The transition experience of developmentally impaired young adults living in a structured apartment setting. ANS Adv Nurs Sci. 2012 Jul-Sep;35(3):E73-89. PMID: 22869219; X-5
1787. Pellicano E. Do Autistic Symptoms Persist across Time? Evidence of Substantial Change in Symptomatology over a 3-Year Period in Cognitively Able Children with Autism. American Journal on Intellectual and Developmental Disabilities. 2012;117(2):156-66. X-4
1788. Pelosi S, Rivas A, Haynes DS, et al. Stimulation rate reduction and auditory development in poorly performing cochlear implant users with auditory neuropathy. Otol Neurotol. 2012 Dec;33(9):1502-6. PMID: 22972423; X-5
1789. Pennesi CM, Klein LC. Effectiveness of the gluten-free, casein-free diet for children diagnosed with autism spectrum disorder: Based on parental report. Nutritional Neuroscience. 2012;15(2):85-91. X-4
1790. Pennington R, Strange C, Stenhoff D, et al. Leave the Running Shoes at Home: Addressing Elopement in the Classroom. Beyond Behavior. 2012;21(3):3-7. X-3
1791. Pennington RC, Stenhoff DM, Gibson J, et al. Using Simultaneous Prompting to Teach Computer-Based Story Writing to a Student with Autism. Education and Treatment of Children. 2012 August 2012;35(3):389-406. X-3
1792. Penrod B, Gardella L, Fernand J. An evaluation of a progressive high-probability instructional sequence combined with low-probability demand fading in the treatment of food selectivity. Journal of Applied Behavior Analysis. 2012;45(3):527-37. X-3
1793. Pepin G, Stagnitti K. Come play with me: an argument to link autism spectrum disorders and anorexia nervosa through early childhood pretend play. Eat Disord. 2012 May;20(3):254-9. PMID: 22519903; X-5
1794. Perrin CJ, Neef NA. Further Analysis of Variables That Affect Self-Control with Aversive Events. Journal of Applied Behavior Analysis. 2012;45(2):299-313. X-3, X-4
1795. Perrin JM, Coury DL, Jones N, et al. The Autism Treatment Network and Autism Intervention Research Network on Physical Health: future directions. Pediatrics. 2012 Nov;130 Suppl 2:S198-201. PMID: 23118252; X-5

1796. Perry A. Autism beyond pediatrics: why bioethicists ought to rethink consent in light of chronicity and genetic identity. Bioethics. 2012 Jun;26(5):236-41. PMID: 22571426; X-5
1797. Peterson CC, Wellman HM, Slaughter V. The mind behind the message: advancing theory-of-mind scales for typically developing children, and those with deafness, autism, or Asperger syndrome. Child Dev. 2012 Mar-Apr;83(2):469-85. PMID: 22304467; X-5
1798. Peters-Scheffer N, Didden R, Korzilius H, et al. Cost comparison of early intensive behavioral intervention and treatment as usual for children with autism spectrum disorder in The Netherlands. Res Dev Disabil. 2012 Nov-Dec;33(6):1763-72. PMID: 22705454; X-5
1799. Pillay Y, Bhat CS. Facilitating Support for Students with Asperger's Syndrome. Journal of College Student Psychotherapy. 2012;26(2):140-54. X-5
1800. Pillmann F, Wustmann T, Marneros A. Acute and transient psychotic disorders versus persistent delusional disorders: a comparative longitudinal study. Psychiatry Clin Neurosci. 2012 Feb;66(1):44-52. PMID: 22250609; X-5
1801. Pinborough-Zimmerman J, Bakian AV, Fombonne E, et al. Changes in the Administrative Prevalence of Autism Spectrum Disorders: Contribution of Special Education and Health from 2002-2008. Journal of Autism and Developmental Disorders. 2012;42(4):521-30. X-5
1802. Pindiprolu SS. A Review of Naturalistic Interventions with Young Children with Autism. Journal of the International Association of Special Education. 2012;13(1):69-78. X-2, X-5
1803. Pineda JA, Juavinett A, Datko M. Self-regulation of brain oscillations as a treatment for aberrant brain connections in children with autism. Med Hypotheses. 2012 Dec;79(6):790-8. PMID: 22999736; X-5
1804. Plavnick JB, Ferreri SJ. Collateral Effects of Mand Training for Children with Autism. Research in Autism Spectrum Disorders. 2012;6(4):1366-76. X-3
1805. Polick AS, Carr JE, Hanney NM. A comparison of general and descriptive praise in teaching intraverbal behavior to children with autism. Journal of Applied Behavior Analysis. 2012;45(3):593-9. X-3
1806. Pollard JS, Betz AM, Higbee TS. Script Fading to Promote Unscripted Bids for Joint Attention in Children with Autism. Journal of Applied Behavior Analysis. 2012;45(2):387-93. X-3
1807. Poon KK. Supporting Adults with Autism Spectrum Disorders: Lessons from Six Decades of International Research. International Journal of Special Education. 2012 2012;27(3):134-47. X-5
1808. Powell G, McCauley AW. Blogging as a Way to Promote Family-Professional Partnerships. Young Exceptional Children. 2012;15(2):20-31. X-1, X-2, X-3, X-4
1809. Pozzi-Monzo M. Ritalin for Whom? Revisited: Further Thinking on ADHD. Journal of Child Psychotherapy. 2012;38(1):49-60. X-5
1810. Prater MA, Carter N, Hitchcock C, et al. Video Self-Modeling to Improve Academic Performance: A Literature Review. Psychology in the Schools. 2012;49(1):71-81. X-2, X-3, X-4
1811. Pratt K, Baird G, Gringras P. Ensuring successful admission to hospital for young people with learning difficulties, autism and challenging behaviour: a continuous quality improvement and change management programme. Child Care Health Dev. 2012 Nov;38(6):789-97. PMID: 22017703; X-5
1812. Pringle B, Colpe LJ, Blumberg SJ, et al. Diagnostic history and treatment of school-aged children with autism spectrum disorder and special health care needs. NCHS Data Brief. 2012 May(97):1-8. PMID: 23050521; X-5
1813. Rama I, Kontu E. Searching for Pedagogical Adaptations by Exploring Teacher's Tacit Knowledge and Interactional Co-Regulation in the Education of Pupils with Autism. European Journal of Special Needs Education. 2012;27(4):417-31. X-3, X-5
1814. Ramisch J. Marriage and Family Therapists Working with Couples Who Have Children with Autism. Journal of Marital and Family Therapy. 2012;38(2):305-16. X-1, X-2, X-3, X-4
1815. Ravindran N, Myers BJ. Cultural Influences on Perceptions of Health, Illness, and Disability: A Review and Focus on Autism. Journal of Child and Family Studies. 2012;21(2):311-9. X-5
1816. Reichow B. Overview of Meta-Analyses on Early Intensive Behavioral Intervention for Young Children with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders. 2012;42(4):512-20. X-5
1817. Reszka SS, Odom SL, Hume KA. Ecological Features of Preschools and the Social Engagement of Children with Autism. Journal of Early Intervention. 2012;34(1):40-56. X-5
1818. Richardson S, Garcia-Ramirez J, Lu W, et al. Design and dosimetric characteristics of a new endocavitary contact radiotherapy system using an electronic brachytherapy source. Med Phys. 2012 Nov;39(11):6838-46. PMID: 23127076; X-5
1819. Richman DM, Dotson WH, Rose CA, et al. Effects of Age on the Types and Severity of Excessive Fear or the Absence of Fear in Children and Young Adults with Autism. Journal of Mental Health Research in Intellectual Disabilities. 2012;5(3):1-21. X-5

1820. Rivard M, Forget J. Verbal behavior in young children with autism spectrum disorder at the onset of an early behavioral intervention program. The Psychological Record. 2012;62(2):167-86. X-4
1821. Roberts TP, Heiken K, Kahn SY, et al. Delayed magnetic mismatch negativity field, but not auditory M100 response, in specific language impairment. Neuroreport. 2012 May 30;23(8):463-8. PMID: 22551948; X-5
1822. Rodriguez NM, Thompson RH, Schlichenmeyer K, et al. Functional analysis and treatment of arranging and ordering by individuals with an autism spectrum disorder. J Appl Behav Anal. 2012 Spring;45(1):1-22. PMID: 22403446; X-3
1823. Roke Y, Buitelaar JK, Boot AM, et al. Risk of hyperprolactinemia and sexual side effects in males 10–20 years old diagnosed with autism spectrum disorders or disruptive behavior disorder and treated with risperidone. Journal of Child and Adolescent Psychopharmacology. 2012;22(6):432-9. X-1, X-3
1824. Roke Y, van Harten PN, Buitelaar JK, et al. Antipsychotic-induced hyperprolactinemia and testosterone levels in boys. Horm Res Paediatr. 2012;77(4):235-40. PMID: 22538969; X-1, X-3, X-4
1825. Roke Y, van Harten PN, Buitelaar JK, et al. Bone mineral density in male adolescents with autism spectrum disorders and disruptive behavior disorder with or without antipsychotic treatment. Eur J Endocrinol. 2012 Dec;167(6):855-63. PMID: 23011870; X-1, X-3
1826. Roux AM, Herrera P, Wold CM, et al. Developmental and autism screening through 2-1-1: Reaching underserved families. American Journal of Preventive Medicine. 2012;43(6, Suppl 5):S457-S63. X-5
1827. Ruble L, McGrew JH, Toland MD. Goal Attainment Scaling as an Outcome Measure in Randomized Controlled Trials of Psychosocial Interventions in Autism. Journal of Autism and Developmental Disorders. 2012;42(9):1974-83. X-4
1828. Russell B. Reflections on 'autistic integrity'. Bioethics. 2012 Mar;26(3):164-70. PMID: 20497166; X-5
1829. Russell G, Golding J, Norwich B, et al. Social and Behavioural Outcomes in Children Diagnosed with Autism Spectrum Disorders: A Longitudinal Cohort Study. Journal of Child Psychology and Psychiatry. 2012;53(7):735-44. X-5
1830. Russo N, Mottron L, Burack JA, et al. Parameters of semantic multisensory integration depend on timing and modality order among people on the autism spectrum: evidence from event-related potentials. Neuropsychologia. 2012 Jul;50(9):2131-41. PMID: 22613013; X-5
1831. Ryan S, Salisbury H. 'You know what boys are like': pre-diagnosis experiences of parents of children with autism spectrum conditions. Br J Gen Pract. 2012 May;62(598):e378-83. PMID: 22546598; X-5
1832. Saalasti S, Katsyri J, Tiippana K, et al. Audiovisual speech perception and eye gaze behavior of adults with asperger syndrome. J Autism Dev Disord. 2012 Aug;42(8):1606-15. PMID: 22068821; X-5
1833. Salgueiro E, Nunes L, Barros A, et al. Effects of a dolphin interaction program on children with autism spectrum disorders: an exploratory research. BMC Res Notes. 2012;5:199. PMID: 22537536; X-5
1834. Samios C, Pakenham KI, Sofronoff K. Sense Making and Benefit Finding in Couples Who Have a Child with Asperger Syndrome: An Application of the Actor-Partner Interdependence Model. Autism: The International Journal of Research and Practice. 2012;16(3):275-92. X-5
1835. Sampanthavivat M, Singkhwa W, Chaiyakul T, et al. Hyperbaric oxygen in the treatment of childhood autism: a randomised controlled trial. Diving Hyperb Med. 2012 Sep;42(3):128-33. PMID: 22987458; X-5
1836. Samuels R, Stansfield J. The Effectiveness of Social Stories[TM] to Develop Social Interactions with Adults with Characteristics of Autism Spectrum Disorder. British Journal of Learning Disabilities. 2012;40(4):272-85. X-5
1837. Sansosti FJ. Reducing the Threatening and Aggressive Behavior of a Middle School Student with Asperger's Syndrome. Preventing School Failure. 2012 2012;56(1):8-18. X-5
1838. Sansosti FJ, Lavik KB, Sansosti JM. Family Experiences through the Autism Diagnostic Process. Focus on Autism and Other Developmental Disabilities. 2012;27(2):81-92. X-5
1839. Sansosti JM, Sansosti FJ. Inclusion for students with high-functioning autism spectrum disorders: Definitions and decision making. Psychology in the Schools. 2012;49(10):917-31. X-5
1840. Sato S, Ikebuchi E, Anzai N, et al. Effects of psychosocial program for preparing long-term hospitalized patients with schizophrenia for discharge from hospital: randomized controlled trial. Psychiatry Clin Neurosci. 2012 Oct;66(6):474-81. PMID: 23066765; X-5
1841. Satory PR. Calculation of midplane dose for total body irradiation from entrance and exit dose MOSFET measurements. Australas Phys Eng Sci Med. 2012 Mar;35(1):101-4. PMID: 22298238; X-5
1842. Sauer C, Montag C, Worner C, et al. Effects of a common variant in the CD38 gene on social processing in an oxytocin challenge study: possible links to autism. Neuropsychopharmacology. 2012 May;37(6):1474-82. PMID: 22278094; X-5
1843. Sawicka K, Zukin RS. Dysregulation of mTOR signaling in neuropsychiatric disorders: therapeutic implications. Neuropsychopharmacology. 2012 Jan;37(1):305-6. PMID: 22157871; X-5

1844. Saylor S, Sidener TM, Reeve SA, et al. Effects of Three Types of Noncontingent Auditory Stimulation on Vocal Stereotypy in Children with Autism. Journal of Applied Behavior Analysis. 2012;45(1):185-90. X-3
1845. Scahill L, McCracken JT, Bearss K, et al. Design and subject characteristics in the federally-funded citalopram trial in children with pervasive developmental disorders. J Autism Dev Disord. 2012 Mar;42(3):432-40. PMID: 21667200; X-2, X-3, X-4, X-5
1846. Schaaf RC, Benevides TW, Kelly D, et al. Occupational therapy and sensory integration for children with autism: a feasibility, safety, acceptability and fidelity study. Autism. 2012 May;16(3):321-7. PMID: 22318118; X-4
1847. Schaal DW. Introduction to "The Behavior-Analytic Origins of Constraint-Induced Movement Therapy: An Example of Behavioral Neurorehabilitation". Behavior Analyst. 2012;35(2):153-4. X-5
1848. Scheflen SC, Freeman SF, Paparella T. Using Video Modeling to Teach Young Children with Autism Developmentally Appropriate Play and Connected Speech. Education and Training in Autism and Developmental Disabilities. 2012;47(3):302-18. X-3
1849. Schertz HH, Reichow B, Tan P, et al. Interventions for Toddlers with Autism Spectrum Disorders: An Evaluation of Research Evidence. SAGE Publications. 2455 Teller Road, Thousand Oaks, CA 91320.; 2012. p. 166-89. X-4
1850. Schipul SE, Williams DL, Keller TA, et al. Distinctive neural processes during learning in autism. Cereb Cortex. 2012 Apr;22(4):937-50. PMID: 21725037; X-1, X-3, X-4
1851. Schmidt C, Stichter JP. The Use of Peer-Mediated Interventions to Promote the Generalization of Social Competence for Adolescents with High-Functioning Autism and Asperger's Syndrome. Exceptionality. 2012;20(2):94-113. X-5
1852. Seiverling L, Williams K, Sturmey P, et al. Effects of behavioral skills training on parental treatment of children's food selectivity. J Appl Behav Anal. 2012 Spring;45(1):197-203. PMID: 22403466; X-3, X-5
1853. Sharma A, Gokulchandran N, Chopra G, et al. Administration of autologous bone marrow-derived mononuclear cells in children with incurable neurological disorders and injury is safe and improves their quality of life. Cell Transplant. 2012;21 Suppl 1:S79-90. PMID: 22507683; X-5
1854. Sharma A, Shaw SR. Efficacy of risperidone in managing maladaptive behaviors for children with autistic spectrum disorder: A meta-analysis. Journal of Pediatric Health Care. 2012;26(4):291-9. X-5
1855. Sharma S, Woolfson LM, Hunter SC. Confusion and inconsistency in diagnosis of Asperger syndrome: A review of studies from 1981 to 2010. Autism. 2012;16(5):465-86. X-5
1856. Sharp RA, Phillips KJ, Mudford OC. Comparisons of Interventions for Rumination Maintained by Automatic Reinforcement. Research in Autism Spectrum Disorders. 2012;6(3):1107-12. X-3
1857. Shield A, Meier RP. Palm reversal errors in native-signing children with autism. J Commun Disord. 2012 Nov;45(6):439-54. PMID: 22981637; X-5
1858. Shin H, Youn J, Kim JS, et al. Caregiver burden in Parkinson disease with dementia compared to Alzheimer disease in Korea. J Geriatr Psychiatry Neurol. 2012 Dec;25(4):222-6. PMID: 23172764; X-5
1859. Shin S, Koh M-s, Yeo M-H. A Comparative Study of the Preliminary Effects in the Levels of Adaptive Behaviors: Learning Program for the Development of Children with Autism (LPDCA). Journal of the International Association of Special Education. 2012;13(1):6-15. X-4
1860. Shogren KA, Plotner AJ. Transition planning for students with intellectual disability, autism, or other disabilities: data from the National Longitudinal Transition Study-2. Intellect Dev Disabil. 2012 Feb;50(1):16-30. PMID: 22316223; X-5
1861. Shultz S, Vouloumanos A, Pelphrey K. The superior temporal sulcus differentiates communicative and noncommunicative auditory signals. J Cogn Neurosci. 2012 May;24(5):1224-32. PMID: 22360624; X-5
1862. Siegel M. Psychopharmacology of autism spectrum disorder: evidence and practice. Child Adolesc Psychiatr Clin N Am. 2012 Oct;21(4):957-73. PMID: 23040909; X-5
1863. Siegel M, Beaulieu AA. Psychotropic Medications in Children with Autism Spectrum Disorders: A Systematic Review and Synthesis for Evidence-Based Practice. Journal of Autism and Developmental Disorders. 2012;42(8):1592-605. X-5
1864. Siegel M, Doyle K, Chemelski B, et al. Specialized inpatient psychiatry units for children with autism and developmental disorders: a United States survey. J Autism Dev Disord. 2012 Sep;42(9):1863-9. PMID: 22189962; X-5
1865. Silva LM, Schalock M. Autism Parenting Stress Index: Initial Psychometric Evidence. Journal of Autism and Developmental Disorders. 2012;42(4):566-74. X-5
1866. Silverman JL, Smith DG, Rizzo SJ, et al. Negative allosteric modulation of the mGluR5 receptor reduces repetitive behaviors and rescues social deficits in mouse models of autism. Sci Transl Med. 2012 Apr 25;4(131):131ra51. PMID: 22539775; X-5

1867. Siniscalco D, Sapone A, Giordano C, et al. The Expression of Caspases Is Enhanced in Peripheral Blood Mononuclear Cells of Autism Spectrum Disorder Patients. Journal of Autism and Developmental Disorders. 2012;42(7):1403-10. X-5
1868. Sira BK, Fryling MJ. Using Peer Modeling and Differential Reinforcement in the Treatment of Food Selectivity. Education and Treatment of Children. 2012;35(1):91-100. X-3
1869. Slocum SK, Miller SJ, Tiger JH. Using a blocked-trials procedure to teach identity matching to a child with autism. Journal of Applied Behavior Analysis. 2012;45(3):619-24. X-3
1870. Smith LE, Maenner MJ, Seltzer MM. Developmental trajectories in adolescents and adults with autism: the case of daily living skills. J Am Acad Child Adolesc Psychiatry. 2012 Jun;51(6):622-31. PMID: 22632621; X-5
1871. Smith T. Evolution of Research on Interventions for Individuals with Autism Spectrum Disorder: Implications for Behavior Analysts. Behavior Analyst. 2012 2012;35(1):101-13. X-5
1872. Snyder K, Higbee TS, Dayton E. Preliminary Investigation of a Video-Based Stimulus Preference Assessment. Journal of Applied Behavior Analysis. 2012;45(2):413-8. X-3, X-5
1873. Soden SE, Garrison CB, Egan AM, et al. Nutrition, physical activity, and bone mineral density in youth with autistic spectrum disorders. Journal of Developmental and Behavioral Pediatrics. 2012;33(8):618-24. X-5
1874. Sokhadze EM, Baruth JM, Sears L, et al. Prefrontal neuromodulation using rTMS improves error monitoring and correction function in autism. Appl Psychophysiol Biofeedback. 2012 Jun;37(2):91-102. PMID: 22311204; X-1, X-3, X-4
1875. South M, Newton T, Chamberlain PD. Delayed reversal learning and association with repetitive behavior in autism spectrum disorders. Autism Res. 2012 Dec;5(6):398-406. PMID: 23097376; X-5
1876. Sowa M, Meulenbroek R. Effects of Physical Exercise on Autism Spectrum Disorders: A Meta-Analysis. Research in Autism Spectrum Disorders. 2012;6(1):46-57. X-1, X-3, X-4
1877. Spencer TD, Higbee TS. Using Transfer of Stimulus Control Technology to Promote Generalization and Spontaneity of Language. Focus on Autism and Other Developmental Disabilities. 2012;27(4):225-36. X-3
1878. Stagnitti K, O'Connor C, Sheppard L. Impact of the Learn to Play program on play, social competence and language for children aged 5-8 years who attend a specialist school. Aust Occup Ther J. 2012 Aug;59(4):302-11. PMID: 22934903; X-4
1879. State TM, Kern L. A Comparison of Video Feedback and in Vivo Self-Monitoring on the Social Interactions of an Adolescent with Asperger Syndrome. Journal of Behavioral Education. 2012;21(1):18-33. X-5
1880. Stein BD, Sorbero MJ, Goswami U, et al. Impact of a private health insurance mandate on public sector autism service use in Pennsylvania. J Am Acad Child Adolesc Psychiatry. 2012 Aug;51(8):771-9. PMID: 22840548; X-5
1881. Stein LI, Polido JC, Cermak SA. Oral care and sensory concerns in autism. Am J Occup Ther. 2012 Sep-Oct;66(5):e73-6. PMID: 22917131; X-5
1882. Stein LI, Polido JC, Najera SO, et al. Oral care experiences and challenges in children with autism spectrum disorders. Pediatr Dent. 2012 Sep-Oct;34(5):387-91. PMID: 23211914; X-5
1883. Steiner AM, Goldsmith TR, Snow AV, et al. Practitioner's Guide to Assessment of Autism Spectrum Disorders in Infants and Toddlers. Journal of Autism and Developmental Disorders. 2012;42(6):1183-96. X-2, X-5
1884. Steiner AM, Koegel LK, Koegel RL, et al. Issues and Theoretical Constructs regarding Parent Education for Autism Spectrum Disorders. Journal of Autism and Developmental Disorders. 2012;42(6):1218-27. X-2, X-4, X-5
1885. Stephenson J, Carter M, Kemp C. Quality of the Information on Educational and Therapy Interventions Provided on the Web Sites of National Autism Associations. Research in Autism Spectrum Disorders. 2012;6(1):11-8. X-5
1886. Stichter JP, Herzog MJ, O'Connor KV, et al. A Preliminary Examination of a General Social Outcome Measure. Assessment for Effective Intervention. 2012;38(1):40-52. X-1, X-3, X-4
1887. Stichter JP, O'Connor KV, Herzog MJ, et al. Social Competence Intervention for Elementary Students with Aspergers Syndrome and High Functioning Autism. Journal of Autism and Developmental Disorders. 2012;42(3):354-66. X-5
1888. Stigler KA, Mullett JE, Erickson CA, et al. Paliperidone for irritability in adolescents and young adults with autistic disorder. Psychopharmacology (Berl). 2012 Sep;223(2):237-45. PMID: 22549762; X-5
1889. Storch EA, Arnold EB, Jones AM, et al. The role of co-occurring disruptive behavior in the clinical presentation of children and adolescents with anxiety in the context of autism spectrum disorders. Child Psychiatry Hum Dev. 2012 Oct;43(5):734-46. PMID: 22407279; X-4
1890. Strain PS, Barton EE, Dunlap G. Lessons Learned about the Utility of Social Validity. Education and Treatment of Children. 2012;35(2):183-200. X-5

1891. Stratta P, de Cataldo S, Bonanni R, et al. Mental health in L'Aquila after the earthquake. Ann Ist Super Sanita. 2012;48(2):132-7. PMID: 22751555; X-5
1892. Strauss LV. Comparing a narcissistic and an autistic retreat: 'looking through or at the window'. Int J Psychoanal. 2012 Feb;93(1):97-116. PMID: 22320137; X-5
1893. Sturm JM. An Enriched Writers' Workshop for Beginning Writers with Developmental Disabilities. Topics in Language Disorders. 2012 2012;32(4):335-60. X-5
1894. Sun P, Krueger D, Liu J, et al. Surgical resection of subependymal giant cell astrocytomas (SEGAs) and changes in SEGA-related conditions: a US national claims database study. Curr Med Res Opin. 2012 Apr;28(4):651-6. PMID: 22375957; X-5
1895. Susa C, Schlinger HD. Using a lag schedule to increase variability of verbal responding in an individual with autism. Analysis of Verbal Behavior. 2012;28:125-30. X-3
1896. Syriopoulou-Delli CK, Cassimos DC, Tripsianis GI, et al. Teachers' perceptions regarding the management of children with autism spectrum disorders. J Autism Dev Disord. 2012 May;42(5):755-68. PMID: 21698499; X-5
1897. Szeftel R, Federico C, Hakak R, et al. Improved access to mental health evaluation for patients with developmental disabilities using telepsychiatry. J Telemed Telecare. 2012 Sep;18(6):317-21. PMID: 22892376; X-5
1898. Szymanski CA. Managing Behavior by Managing the Classroom: Making Learning Accessible for Deaf and Hard of Hearing Students with Autism Spectrum Disorders. Odyssey: New Directions in Deaf Education. 2012;13:26-31. X-5
1899. Taheri A, Perry A. Exploring the proposed DSM-5 criteria in a clinical sample. J Autism Dev Disord. 2012 Sep;42(9):1810-7. PMID: 22806000; X-5
1900. Tanpowpong P, Broder-Fingert S, Katz AJ, et al. Predictors of gluten avoidance and implementation of a gluten-free diet in children and adolescents without confirmed celiac disease. J Pediatr. 2012 Sep;161(3):471-5. PMID: 22484356; X-5
1901. Taylor BA, DeQuinzio JA. Observational learning and children with autism. Behav Modif. 2012 May;36(3):341-60. PMID: 22569578; X-5
1902. Taylor BA, DeQuinzio JA, Stine J. Increasing Observational Learning of Children with Autism: A Preliminary Analysis. Journal of Applied Behavior Analysis. 2012;45(4):815-20. X-3, X-5
1903. Taylor JL, Warren ZE. Maternal depressive symptoms following autism spectrum diagnosis. J Autism Dev Disord. 2012 Jul;42(7):1411-8. PMID: 21965086; X-5
1904. Tek S, Landa RJ. Differences in Autism Symptoms between Minority and Non-Minority Toddlers. Journal of Autism and Developmental Disorders. 2012;42(9):1967-73. X-5
1905. Thomas KC, Parish SL, Rose RA, et al. Access to care for children with autism in the context of state Medicaid reimbursement. Maternal and Child Health Journal. 2012;16(8):1636-44. X-5
1906. Thomas RH, Meeking MM, Mepham JR, et al. The enteric bacterial metabolite propionic acid alters brain and plasma phospholipid molecular species: further development of a rodent model of autism spectrum disorders. J Neuroinflammation. 2012;9:153. PMID: 22747852; X-5
1907. Thomeer ML. Collaborative Development and Component Trials of a Comprehensive School-Based Intervention for Children with HFASDS. Psychology in the Schools. 2012;49(10):955-62. X-3, X-5
1908. Thomson KM, Martin GL, Fazzio D, et al. Evaluation of a self-instructional package for teaching tutors to conduct discrete-trials teaching with children with autism. Research in Autism Spectrum Disorders. 2012;6(3):1073-82. X-5
1909. Thorpe EL, Zimmerman RK, Steinhart JD, et al. Homeschooling parents' practices and beliefs about childhood immunizations. Vaccine. 2012 Feb 1;30(6):1149-53. PMID: 22178729; X-5
1910. Tilford JM, Payakachat N, Kovacs E, et al. Preference-based health-related quality-of-life outcomes in children with autism spectrum disorders: a comparison of generic instruments. Pharmacoeconomics. 2012 Aug 1;30(8):661-79. PMID: 22788258; X-5
1911. Torres C, Farley CA, Cook BG. A Special Educator's Guide to Successfully Implementing Evidence-Based Practices. TEACHING Exceptional Children. 2012;45(1):64-73. X-5
1912. Toussaint KA, Tiger JH. Reducing Covert Self-Injurious Behavior Maintained by Automatic Reinforcement through a Variable Momentary DRO Procedure. Journal of Applied Behavior Analysis. 2012;45(1):179-84. X-1, X-3
1913. Tsao L-L, Davenport R, Schmiege C. Supporting Siblings of Children with Autism Spectrum Disorders. Early Childhood Education Journal. 2012;40(1):47-54. X-5
1914. Tsiouri I, Schoen Simmons E, Paul R. Enhancing the application and evaluation of a discrete trial intervention package for eliciting first words in preverbal preschoolers with ASD. J Autism Dev Disord. 2012 Jul;42(7):1281-93. PMID: 21918912; X-3

1915. Tudor ME, Hoffman CD, Sweeney DP. Children with Autism: Sleep Problems and Symptom Severity. Focus on Autism and Other Developmental Disabilities. 2012;27(4):254-62. X-5
1916. Turan MK, Moroz L, Croteau NP. Comparing the effectiveness of error-correction strategies in discrete trial training. Behav Modif. 2012 Mar;36(2):218-34. PMID: 22133991; X-3
1917. Tzanakaki P, Grindle C, Hastings RP, et al. How and why do parents choose early intensive behavioral intervention for their young child with autism. Education and Training in Autism and Developmental Disabilities. 2012;47(1):58-71. X-5
1918. Uno Y, Uchiyama T, Kurosawa M, et al. The combined measles, mumps, and rubella vaccines and the total number of vaccines are not associated with development of autism spectrum disorder: the first case-control study in Asia. Vaccine. 2012 Jun 13;30(28):4292-8. PMID: 22521285; X-5
1919. Valayannopoulos V, Boddaert N, Chabli A, et al. Treatment by oral creatine, L-arginine and L-glycine in six severely affected patients with creatine transporter defect. J Inherit Metab Dis. 2012 Jan;35(1):151-7. PMID: 21660517; X-5
1920. Valenti M, Ciprietti T, Di Egidio C, et al. Adaptive Response of Children and Adolescents with Autism to the 2009 Earthquake in L'Aquila, Italy. Journal of Autism and Developmental Disorders. 2012;42(6):954-60. X-5
1921. Valentine RM, Wood K, Brown CT, et al. Monte Carlo simulations for optimal light delivery in photodynamic therapy of non-melanoma skin cancer. Phys Med Biol. 2012 Oct 21;57(20):6327-45. PMID: 22990348; X-5
1922. Valentino AL, Shillingsburg MA, Call NA. Comparing the effects of echoic prompts and echoic prompts plus modeled prompts on intraverbal behavior. J Appl Behav Anal. 2012 Summer;45(2):431-5. PMID: 22844151; X-5
1923. Valicenti-McDermott M, Hottinger K, Seijo R, et al. Age at diagnosis of autism spectrum disorders. J Pediatr. 2012 Sep;161(3):554-6. PMID: 22683037; X-5
1924. van der Meer L, Kagohara D, Achmadi D, et al. Speech-generating devices versus manual signing for children with developmental disabilities. Res Dev Disabil. 2012 Sep-Oct;33(5):1658-69. PMID: 22554812; X-3
1925. van der Meer L, Sutherland D, O'Reilly MF, et al. A Further Comparison of Manual Signing, Picture Exchange, and Speech-Generating Devices as Communication Modes for Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2012;6(4):1247-57. X-3
1926. van Gent T, Goedhart AW, Treffers PD. Characteristics of Children and Adolescents in the Dutch National in- and Outpatient Mental Health Service for Deaf and Hard of Hearing Youth over a Period of 15 Years. Research in Developmental Disabilities: A Multidisciplinary Journal. 2012;33(5):1333-42. X-5
1927. van Nijnatten C, Heestermans M. Communicative empowerment of people with intellectual disability. J Intellect Dev Disabil. 2012 Jun;37(2):100-11. PMID: 22563691; X-5
1928. van Steensel FJA, Bögels S, Dirksen C. Anxiety and quality of life: Clinically anxious children with and without autism spectrum disorders compared. Journal of Clinical Child and Adolescent Psychology. 2012;41(6):731-8. X-5
1929. van Tongerloo MAMM, Bor HHJ, Lagro-Janssen ALM. Detecting autism spectrum disorders in the general practitioner's practice. Journal of Autism and Developmental Disorders. 2012;42(8):1531-8. X-5
1930. Van Waelvelde H, Hellinckx T, Peersman W, et al. SOS: A Screening Instrument to Identify Children with Handwriting Impairments. Physical & Occupational Therapy in Pediatrics. 2012;32(3):306-19. X-5
1931. Vandbakk M, Arntzen E, Gisnaas A, et al. Effect of Training Different Classes of Verbal Behavior to Decrease Aberrant Verbal Behavior. Analysis of Verbal Behavior. 2012;28:137-44. X-5
1932. Vande Wydeven K, Kwan A, Hardan AY, et al. Underutilization of genetics services for autism: the importance of parental awareness and provider recommendation. J Genet Couns. 2012 Dec;21(6):803-13. PMID: 22415587; X-5
1933. Vanderborght B, Simut R, Saldien J, et al. Using the social robot Probo as a social story telling agent for children with ASD. Interaction Studies: Social Behaviour and Communication in Biological and Artificial Systems. 2012;13(3):348-72. X-3
1934. Varni JW, Handen BL, Corey-Lisle PK, et al. Effect of aripiprazole 2 to 15 mg/d on health-related quality of life in the treatment of irritability associated with autistic disorder in children: a post hoc analysis of two controlled trials. Clin Ther. 2012 Apr;34(4):980-92. PMID: 22444782; X-5
1935. Veenstra-VanderWeele J. In this issue/abstract thinking: evolving picture of susceptibility factors in autism spectrum disorders. J Am Acad Child Adolesc Psychiatry. 2012 May;51(5):453-4. PMID: 22525947; X-5
1936. Verhoeven EW, Marijnissen N, Berger HJ, et al. Brief report: relationship between self-awareness of real-world behavior and treatment outcome in autism spectrum disorders. J Autism Dev Disord. 2012 May;42(5):889-94. PMID: 21698498; X-5

1937. Vernon TW, Koegel RL, Dauterman H, et al. An Early Social Engagement Intervention for Young Children with Autism and Their Parents. Journal of Autism and Developmental Disorders. 2012;42(12):2702-17. X-3
1938. Vladescu JC, Carroll R, Paden A, et al. The Effects of Video Modeling with Voiceover Instruction on Accurate Implementation of Discrete-Trial Instruction. Journal of Applied Behavior Analysis. 2012;45(2):419-23. X-3, X-5
1939. Wabulembo G, Demer JL. Long-term outcome of medial rectus recession and pulley posterior fixation in esotropia with high AC/A ratio. Strabismus. 2012 Sep;20(3):115-20. PMID: 22906381; X-5
1940. Waligorska A, Pisula E, Waligorski M, et al. AutismPro system in supporting treatment of children with autism in Poland. Pediatr Int. 2012 Oct;54(5):693-700. PMID: 22469462; X-3
1941. Wallace S, Fein D, Rosanoff M, et al. A global public health strategy for autism spectrum disorders. Autism Res. 2012 Jun;5(3):211-7. PMID: 22605577; X-5
1942. Walton KM, Ingersoll BR. Evaluation of a Sibling-Mediated Imitation Intervention for Young Children with Autism. Journal of Positive Behavior Interventions. 2012;14(4):241-53. X-3
1943. Wang J, Zhou X, Xia W, et al. Autism awareness and attitudes towards treatment in caregivers of children aged 3–6 years in Harbin, China. Social Psychiatry and Psychiatric Epidemiology. 2012;47(8):1301-8. X-5
1944. Wang J, Zhou X, Xia W, et al. Parent-reported health care expenditures associated with autism spectrum disorders in Heilongjiang province, China. BMC Health Serv Res. 2012;12:7. PMID: 22230043; X-5
1945. Wanzek M, Jenson WR, Houlihan D. Recognizing and Treating Rett Syndrome in Schools. School Psychology International. 2012;33(2):151-66. X-5
1946. Weil TN, Inglehart MR. Three- to 21-year-old patients with autism spectrum disorders: parents' perceptions of severity of symptoms, oral health, and oral health-related behavior. Pediatr Dent. 2012 Nov-Dec;34(7):473-9. PMID: 23265164; X-5
1947. Welterlin A, Turner-Brown LM, Harris S, et al. The Home TEACCHing Program for Toddlers with Autism. Journal of Autism and Developmental Disorders. 2012;42(9):1827-35. X-5
1948. Wentz E, Nyden A, Krevers B. Development of an internet-based support and coaching model for adolescents and young adults with ADHD and autism spectrum disorders: a pilot study. Eur Child Adolesc Psychiatry. 2012 Nov;21(11):611-22. PMID: 22736195; X-5
1949. White SW. Growing Pains: How Psychologists Can Help to Meet the Clinical Needs of Clients with Autism Spectrum Disorders. Cognitive and Behavioral Practice. 2012;19(3):433-6. X-5
1950. White SW, Schry AR, Maddox BB. Brief Report: The Assessment of Anxiety in High-Functioning Adolescents with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders. 2012;42(6):1138-45. X-5
1951. Whiteley P, Shattock P, Knivsberg AM, et al. Gluten- and casein-free dietary intervention for autism spectrum conditions. Front Hum Neurosci. 2012;6:344. PMID: 23316152; X-1, X-2, X-3, X-4
1952. Williams PG, Tomchek S, Grau R, et al. Parent and physician perceptions of medical home care for children with autism spectrum disorders in the state of Kentucky. Clin Pediatr (Phila). 2012 Nov;51(11):1071-8. PMID: 22984194; X-5
1953. Williams PG, Woods C, Stevenson M, et al. Psychotropic medication use in children with autism in the Kentucky Medicaid population. Clin Pediatr (Phila). 2012 Oct;51(10):923-7. PMID: 22492834; X-5
1954. Williams RT, Mackness J, Gumtau S. Footprints of Emergence. International Review of Research in Open and Distance Learning. 2012 October 2012;13(4):49-90. X-5
1955. Williams SC. Genetics: Searching for answers. Nature. 2012 Nov 1;491(7422):S4-6. PMID: 23136651; X-5
1956. Williamson ED, Martin A. Psychotropic Medications in Autism: Practical Considerations for Parents. Journal of Autism and Developmental Disorders. 2012;42(6):1249-55. X-5
1957. Wilson KP, Dykstra JR, Watson LR, et al. Coaching in early education classrooms serving children with autism: A pilot study. Early Childhood Education Journal. 2012;40(2):97-105. X-3, X-4
1958. Wolfberg P, Bottema-Beutel K, DeWitt M. Including Children with Autism in Social and Imaginary Play with Typical Peers: Integrated Play Groups Model. American Journal of Play. 2012;5(1):55-80. X-1, X-2, X-3, X-4
1959. Wong C, Kasari C. Play and Joint Attention of Children with Autism in the Preschool Special Education Classroom. Journal of Autism and Developmental Disorders. 2012;42(10):2152-61. X-4
1960. Wong JD, Seltzer MM, Greenberg JS, et al. Stressful life events and daily stressors affect awakening cortisol level in midlife mothers of individuals with autism spectrum disorders. Aging Ment Health. 2012;16(8):939-49. PMID: 22640177; X-5
1961. Woodward JF, Swigonski NL, Ciccarelli MR. Assessing the health, functional characteristics, and health needs of youth attending a noncategorical transition support program. J Adolesc Health. 2012 Sep;51(3):272-8. PMID: 22921138; X-5

1962. Wright SD, D'Astous V, Wright CA, et al. Grandparents of grandchildren with autism spectrum disorders (ASD): strengthening relationships through technology activities. Int J Aging Hum Dev. 2012;75(2):169-84. PMID: 23185859; X-3, X-5
1963. Yaddanapudi S, Oddiraju S, Rodriguez V, et al. Independent verification of transferred delivery sinogram between two dosimetrically matched helical tomotherapy machines: a protocol for patient-specific quality assurance. Phys Med Biol. 2012 Sep 7;57(17):5617-31. PMID: 22892686; X-5
1964. Yamazaki H, Yamamoto R, Moroto S, et al. Cochlear implantation in children with congenital cytomegalovirus infection accompanied by psycho-neurological disorders. Acta Otolaryngol. 2012 Apr;132(4):420-7. PMID: 22443855; X-3, X-5
1965. Ying KC, Browne G, Hutchinson M, et al. Autism in Vietnam: the case for the development and evaluation of an information book to be distributed at the time of diagnosis. Issues Ment Health Nurs. 2012 May;33(5):288-92. PMID: 22545635; X-5
1966. Young KL, Boris AL, Thomson KM, et al. Evaluation of a self-instructional package on discrete-trials teaching to parents of children with autism. Research in Autism Spectrum Disorders. 2012;6(4):1321-30. X-5
1967. Yui K, Koshiba M, Nakamura S, et al. Effects of large doses of arachidonic acid added to docosahexaenoic acid on social impairment in individuals with autism spectrum disorders: a double-blind, placebo-controlled, randomized trial. J Clin Psychopharmacol. 2012 Apr;32(2):200-6. PMID: 22370992; X-1, X-3
1968. Zarb P, Amadeo B, Muller A, et al. Antimicrobial prescribing in hospitalized adults stratified by age: data from the ESAC point-prevalence surveys. Drugs Aging. 2012 Jan 1;29(1):53-62. PMID: 22191723; X-5
1969. Zeglam AM, Maouna A. Is there a need for a focused health care service for children with autistic spectrum disorders? A keyhole look at this problem in Tripoli, Libya. Autism. 2012;16(4):337-9. X-5
1970. Zhang R, Jia MX, Zhang JS, et al. Transcutaneous electrical acupoint stimulation in children with autism and its impact on plasma levels of arginine-vasopressin and oxytocin: a prospective single-blinded controlled study. Res Dev Disabil. 2012 Jul-Aug;33(4):1136-46. PMID: 22502839; X-5
1971. Zimmer MH, Hart LC, Manning-Courtney P, et al. Food variety as a predictor of nutritional status among children with autism. Journal of Autism and Developmental Disorders. 2012;42(4):549-56. X-5
1972. Abu-Asab MS, Abu-Asab N, Loffredo CA, et al. Identifying early events of gene expression in breast cancer with systems biology phylogenetics. Cytogenet Genome Res. 2013;139(3):206-14. PMID: 23548567; X-5
1973. Adluru N, Hanlon BM, Lutz A, et al. Penalized likelihood phenotyping: unifying voxelwise analyses and multi-voxel pattern analyses in neuroimaging: penalized likelihood phenotyping. Neuroinformatics. 2013 Apr;11(2):227-47. PMID: 23397550; X-5
1974. Alaghband-Rad J, Nikvarz N, Tehrani-Doost M, et al. Memantine-induced speech problems in two patients with autistic disorder. Daru. 2013;21(1):54. PMID: 23819879; X-5
1975. Alanazi AS. The role of nutraceuticals in the management of autism. Saudi Pharm J. 2013 Jul;21(3):233-43. PMID: 24151428; X-5
1976. Al-Ayadhi LY, Elamin NE. Camel Milk as a Potential Therapy as an Antioxidant in Autism Spectrum Disorder (ASD). Evid Based Complement Alternat Med. 2013;2013:602834. PMID: 24069051; X-5
1977. Aldinger KA, Plummer JT, Levitt P. Comparative DNA methylation among females with neurodevelopmental disorders and seizures identifies TAC1 as a MeCP2 target gene. J Neurodev Disord. 2013;5(1):15. PMID: 23759142; X-5
1978. Amir D. The Psychic Organ Point of Autistic Syntax. Journal of Child Psychotherapy. 2013;39(1):3-21. X-5
1979. Anderson DK, Liang JW, Lord C. Predicting young adult outcome among more and less cognitively able individuals with autism spectrum disorders. J Child Psychol Psychiatry. 2013 Dec 9PMID: 24313878; X-5
1980. Angst PD, Piccinin FB, Oppermann RV, et al. Response of molars and non-molars to a strict supragingival control in periodontal patients. Braz Oral Res. 2013 Jan-Feb;27(1):55-60. PMID: 23306627; X-5
1981. Arber C, Li M. Cortical interneurons from human pluripotent stem cells: prospects for neurological and psychiatric disease. Front Cell Neurosci. 2013;7:10. PMID: 23493959; X-5
1982. Armstrong K, Kimonis ER. Parent–child interaction therapy for the treatment of Asperger's disorder in early childhood: A case study. Clinical Case Studies. 2013;12(1):60-72. X-3
1983. Asadabadi M, Mohammadi M-R, Ghanizadeh A, et al. Celecoxib as adjunctive treatment to risperidone in children with autistic disorder: A randomized, double-blind, placebo-controlled trial. Psychopharmacology. 2013;225(1):51-9. X-5
1984. Asahi Y, Omichi S, Adachi S, et al. Ventilation via cut nasotracheal tube during general anesthesia. Anesth Prog. 2013 Spring;60(1):11-4. PMID: 23506278; X-4, X-5

1985. Ashburner J, Rodger S, Ziviani J, et al. Occupational therapy services for people with autism spectrum disorders: Current state of play, use of evidence and future learning priorities. Aust Occup Ther J. 2013 Oct 9PMID: 24118044; X-5
1986. Assaf M, Hyatt CJ, Wong CG, et al. Mentalizing and motivation neural function during social interactions in autism spectrum disorders. Neuroimage Clin. 2013;3:321-31. PMID: 24273716; X-5
1987. Badgett N, Falcomata TS. A comparison of methodologies of brief functional analysis. Dev Neurorehabil. 2013 Jul 19PMID: 23869515; X-3, X-5
1988. Bang J, Burns J, Nadig A. Brief report: Conveying subjective experience in conversation: production of mental state terms and personal narratives in individuals with high functioning autism. J Autism Dev Disord. 2013 Jul;43(7):1732-40. PMID: 23179342; X-5
1989. Barakova EI, Gillesen JCC, Huskens BEBM, et al. End-user programming architecture facilitates the uptake of robots in social therapies. Robotics and Autonomous Systems. 2013;61(7):704-13. X-5
1990. Barlow KE, Tiger JH, Slocum SK, et al. Comparing acquisition of exchange-based and signed mands with children with autism. Analysis of Verbal Behavior. 2013;29:59-69. X-3
1991. Barnes CS, Rehfeldt RA. Effects of Fluency Instruction on Selection-Based and Topography-Based Comprehension Measures. Research in Autism Spectrum Disorders. 2013 June 2013;7(6):639-47. X-3, X-4, X-5
1992. Baron-Cohen S, Jaffa T, Davies S, et al. Do girls with anorexia nervosa have elevated autistic traits? Mol Autism. 2013;4(1):24. PMID: 23915495; X-5
1993. Barraza JA, Grewal NS, Ropacki S, et al. Effects of a 10-day oxytocin trial in older adults on health and well-being. Exp Clin Psychopharmacol. 2013 Apr;21(2):85-92. PMID: 23421352; X-5
1994. Barton ML, Robins DL, Jashar D, et al. Sensitivity and Specificity of Proposed DSM-5 Criteria for Autism Spectrum Disorder in Toddlers. Journal of Autism and Developmental Disorders. 2013 May 2013;43(5):1184-95. X-5
1995. Bashir S. Hope and great opportunity for young neuroscientist. Pak J Med Sci. 2013 Jul;29(4):897-8. PMID: 24353654; X-5
1996. Bauer AZ, Kriebel D. Prenatal and perinatal analgesic exposure and autism: an ecological link. Environ Health. 2013;12:41. PMID: 23656698; X-5
1997. Bauer NS, Sturm LA, Carroll AE, et al. Computer decision support to improve autism screening and care in community pediatric clinics. Infants & Young Children. 2013;26(4):306-17. X-5
1998. Bauman MD, Schumann CM. Is 'bench-to-bedside' realistic for autism? An integrative neuroscience approach. Neuropsychiatry (London). 2013 Apr;3(2):159-68. PMID: 24000295; X-5
1999. Bauminger-Zviely N, Eden S, Zancanaro M, et al. Increasing social engagement in children with high-functioning autism spectrum disorder using collaborative technologies in the school environment. Autism. 2013;17(3):317-39. X-1
2000. Bay B, Mortensen EL, Hvidtjorn D, et al. Fertility treatment and risk of childhood and adolescent mental disorders: register based cohort study. BMJ. 2013;347:f3978. PMID: 23833075; X-5
2001. Bayes DA, Heath AK, Williams C, et al. Pardon the Interruption: Enhancing Communication Skills for Students with Intellectual Disability. TEACHING Exceptional Children. 2013 2013;45(3):64-70. X-2, X-3
2002. Bearss K, Johnson C, Handen B, et al. A Pilot Study of Parent Training in Young Children with Autism Spectrum Disorders and Disruptive Behavior. Journal of Autism and Developmental Disorders. 2013 April 2013;43(4):829-40. X-5
2003. Bearss K, Lecavalier L, Minshawi N, et al. Toward an exportable parent training program for disruptive behaviors in autism spectrum disorders. Neuropsychiatry (London). 2013 Apr;3(2):169-80. PMID: 23772233; X-4
2004. Becker B, Kruppert S, Kostev K. Economic prescribing of corticosteroid nasal sprays in Germany: comparison of mometasone and budesonide nasal sprays on the basis of the DDD, the PDD and reference prices. Int J Clin Pharmacol Ther. 2013 Jan;51(1):12-8. PMID: 23110787; X-5
2005. Bedford R, Gliga T, Frame K, et al. Failure to learn from feedback underlies word learning difficulties in toddlers at risk for autism. J Child Lang. 2013 Jan;40(1):29-46. PMID: 23217290; X-5
2006. Begeer S, Mandell D, Wijnker-Holmes B, et al. Sex differences in the timing of identification among children and adults with autism spectrum disorders. J Autism Dev Disord. 2013 May;43(5):1151-6. PMID: 23001766; X-5
2007. Bekele ET, Lahiri U, Swanson AR, et al. A step towards developing adaptive robot-mediated intervention architecture (ARIA) for children with autism. IEEE Trans Neural Syst Rehabil Eng. 2013 Mar;21(2):289-99. PMID: 23221831; X-3, X-5
2008. Bekhet AK, Zauszniewski JA. Psychometric Properties of the Resourcefulness Scale Among Caregivers of Persons With Autism Spectrum Disorder. West J Nurs Res. 2013 Oct 21PMID: 24151172; X-5

2009. Belgard TG, Jankovic I, Lowe JK, et al. Population structure confounds autism genetic classifier. Mol Psychiatry. 2013 Apr 2PMID: 23546168; X-5
2010. Belmonte MK, Saxena-Chandhok T, Cherian R, et al. Oral motor deficits in speech-impaired children with autism. Front Integr Neurosci. 2013;7:47. PMID: 23847480; X-5
2011. Benevides TW, Lane SJ. A Review of Cardiac Autonomic Measures: Considerations for Examination of Physiological Response in Children with Autism Spectrum Disorder. J Autism Dev Disord. 2013 Oct 24PMID: 24154761; X-5
2012. Bennett KD, Ramasamy R, Honsberger T. The Effects of Covert Audio Coaching on Teaching Clerical Skills to Adolescents with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders. 2013;43(3):585-93. X-5
2013. Ben-Sasson A, Amit-Ben-Simhon H, Meyer S. Cross-parent reliability in rating ASD markers in infants. Dev Neurorehabil. 2013 Aug 7PMID: 23924084; X-5
2014. Ben-Sasson A, Habib S, Tirosh E. Feasibility and Validity of Early Screening for Identifying Infants With Poor Social-Communication Development in a Well-Baby Clinic System. J Pediatr Nurs. 2013 Nov 25PMID: 24333238; X-5
2015. Benvenuto A, Marciano S, Capuano I, et al. An update on autism spectrum disorders in children. Minerva Pediatr. 2013 Feb;65(1):19-36. PMID: 23422571; X-2, X-5
2016. Berger KA. Resource list for cognitive motor and sensory supports in persons with autism. Front Integr Neurosci. 2013;7:7. PMID: 23447743; X-5
2017. Berris T, Mazonakis M, Stratakis J, et al. Calculation of organ doses from breast cancer radiotherapy: a Monte Carlo study. J Appl Clin Med Phys. 2013;14(1):4029. PMID: 23318389; X-5
2018. Berry R, Firth G, Leeming C, et al. Clinical Psychologists' Views of Intensive Interaction as an Intervention in Learning Disability Services. Clin Psychol Psychother. 2013 May 20PMID: 23696471; X-5
2019. Bhatti I, Thome A, Smith PO, et al. A retrospective study of amitriptyline in youth with autism spectrum disorders. Journal of Autism and Developmental Disorders. 2013;43(5):1017-27. X-5
2020. Billeci L, Sicca F, Maharatna K, et al. On the application of quantitative EEG for characterizing autistic brain: a systematic review. Front Hum Neurosci. 2013;7:442. PMID: 23935579; X-5
2021. Bishop MR, Kenzer AL, Coffman CM, et al. Using stimulus fading without escape extinction to increase compliance with toothbrushing in children with autism. Research in Autism Spectrum Disorders. 2013;7(6):680-6. X-3
2022. Bishop-Fitzpatrick L, Minshew NJ, Eack SM. A Systematic Review of Psychosocial Interventions for Adults with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders. 2013;43(3):687-94. X-5
2023. Blood GW, Blood IM, Coniglio AD, et al. Familiarity Breeds Support: Speech-Language Pathologists' Perceptions of Bullying of Students with Autism Spectrum Disorders. Journal of Communication Disorders. 2013 2013;46(2):169-80. X-5
2024. Boesch MC, Wendt O, Subramanian A, et al. Comparative Efficacy of the Picture Exchange Communication System (PECS) versus a Speech-Generating Device: Effects on Requesting Skills. Research in Autism Spectrum Disorders. 2013 March 2013;7(3):480-93. X-3
2025. Bondad J, Aboumarzouk OM, Moseley H, et al. Oral 5-aminolevulinic acid induced Photodynamic Diagnostic Ureterorenoscopy--does the blood pressure require monitoring? Photodiagnosis Photodyn Ther. 2013 Feb;10(1):39-41. PMID: 23465371; X-5
2026. Bottema-Beutel K, Smith N. The Interactional Construction of Identity: An Adolescent with Autism in Interaction with Peers. Linguistics and Education: An International Research Journal. 2013 June 2013;24(2):197-214. X-5
2027. Bouck EC, Satsangi R, Doughty TT, et al. Virtual and Concrete Manipulatives: A Comparison of Approaches for Solving Mathematics Problems for Students with Autism Spectrum Disorder. J Autism Dev Disord. 2013 Jun 7PMID: 23743958; X-5
2028. Boyd BA, Woodard CR, Bodfish JW. Feasibility of exposure response prevention to treat repetitive behaviors of children with autism and an intellectual disability: a brief report. Autism. 2013 Mar;17(2):196-204. PMID: 21975037; X-3
2029. Bozdagi O, Tavassoli T, Buxbaum JD. Insulin-like growth factor-1 rescues synaptic and motor deficits in a mouse model of autism and developmental delay. Mol Autism. 2013;4(1):9. PMID: 23621888; X-5
2030. Bradley SJ. The importance of early intervention with children and youth in the autism spectrum. J Can Acad Child Adolesc Psychiatry. 2013 Aug;22(3):197-8. PMID: 23970907; X-1, X-2, X-3, X-4

2031. Brandwein AB, Foxe JJ, Butler JS, et al. The development of multisensory integration in high-functioning autism: high-density electrical mapping and psychophysical measures reveal impairments in the processing of audiovisual inputs. Cereb Cortex. 2013 Jun;23(6):1329-41. PMID: 22628458; X-5
2032. Brignell A, Morgan AT, Woolfenden S, et al. How relevant is the framework being used with autism spectrum disorder today? Int J Speech Lang Pathol. 2013 Dec 9PMID: 24313935; X-5
2033. Broder-Fingert S, Shui A, Pulcini CD, et al. Racial and ethnic differences in subspecialty service use by children with autism. Pediatrics. 2013 Jul;132(1):94-100. PMID: 23776121; X-5
2034. Brondino N, De Silvestri A, Re S, et al. A Systematic Review and Meta-Analysis of Ginkgo biloba in Neuropsychiatric Disorders: From Ancient Tradition to Modern-Day Medicine. Evid Based Complement Alternat Med. 2013;2013:915691. PMID: 23781271; X-5
2035. Brundage SB, Whelan CJ, Burgess CM. Brief report: Treating stuttering in an adult with autism spectrum disorder. Journal of Autism and Developmental Disorders. 2013;43(2):483-9. X-5
2036. Bui LTD, Moore DW, Anderson A. Using escape extinction and reinforcement to increase eating in a young child with autism. Behaviour Change. 2013;30(1):48-55. X-3
2037. Bullough A, Booth J. Science for All. Education in Science. 2013 February 2013(251):12-3. X-5
2038. Burton CE, Anderson DH, Prater MA, et al. Video Self-Modeling on an iPad to Teach Functional Math Skills to Adolescents with Autism and Intellectual Disability. Focus on Autism and Other Developmental Disabilities. 2013 June 2013;28(2):67-77. X-5
2039. Butterworth TW, Hodge MA, Sofronoff K, et al. Validation of the Emotion Regulation and Social Skills Questionnaire for Young People with Autism Spectrum Disorders. J Autism Dev Disord. 2013 Dec 14PMID: 24337829; X-5
2040. Buxbaum JD, Baron-Cohen S. DSM-5: the debate continues. Mol Autism. 2013;4(1):11. PMID: 23676181; X-5
2041. Cadogan S, McCrimmon AW. Pivotal response treatment for children with autism spectrum disorder: A systematic review of research quality. Dev Neurorehabil. 2013 Nov 1PMID: 24180635; X-4
2042. Cai Y, Chia NK, Thalmann D, et al. Design and development of a Virtual Dolphinarium for children with autism. IEEE Trans Neural Syst Rehabil Eng. 2013 Mar;21(2):208-17. PMID: 23362251; X-5
2043. Call NA, Zangrillo AN, Delfs CH, et al. A comparison of brief functional analyses with and without consequences. Behavioral Interventions. 2013;28(1):22-39. X-3, X-5
2044. Campillo C, Herrera G, Remirez de Ganuza C, et al. Using Tic-Tac software to reduce anxiety-related behaviour in adults with autism and learning difficulties during waiting periods: A pilot study. Autism. 2013 Oct 3PMID: 24092839; X-5
2045. Carbone PS, Murphy NA, Norlin C, et al. Parent and pediatrician perspectives regarding the primary care of children with autism spectrum disorders. J Autism Dev Disord. 2013 Apr;43(4):964-72. PMID: 22948548; X-5
2046. Carigi T, Muratori F, Termine C, et al. Diagnostic Boundaries of Autism Disorder Vs Pervasive Developmental Disorder Nos: Comparative Observational Study and Literature Review. Curr Clin Pharmacol. 2013 Sep 20PMID: 24050746; X-5
2047. Carlon S, Carter M, Stephenson J. A Review of Declared Factors Identified by Parents of Children with Autism Spectrum Disorders (ASD) in Making Intervention Decisions. Research in Autism Spectrum Disorders. 2013 February 2013;7(2):369-81. X-5
2048. Carroll RA, Kodak T, Fisher WW. An evaluation of programmed treatment-integrity errors during discrete-trial instruction. Journal of Applied Behavior Analysis. 2013;46(2):379-94. X-3
2049. Cashin A, Browne G, Bradbury J, et al. The effectiveness of narrative therapy with young people with autism. Journal of Child and Adolescent Psychiatric Nursing. 2013;26(1):32-41. X-1, X-3
2050. Castro S, Pinto AI. Identification of core functioning features for assessment and intervention in Autism Spectrum Disorders. Disabil Rehabil. 2013 Jan;35(2):125-33. PMID: 22671037; X-5
2051. Cavalari RNS, DuBard M, Luiselli JK, et al. Teaching an adolescent with autism and intellectual disability to tolerate routine medical examination: Effects of a behavioral compliance training package. Clinical Practice in Pediatric Psychology. 2013;1(2):121-8. X-5
2052. Chamberlain PD, Rodgers J, Crowley MJ, et al. A potentiated startle study of uncertainty and contextual anxiety in adolescents diagnosed with autism spectrum disorder. Mol Autism. 2013;4(1):31. PMID: 24007557; X-5
2053. Chang YC, Laugeson EA, Gantman A, et al. Predicting treatment success in social skills training for adolescents with autism spectrum disorders: The UCLA Program for the Education and Enrichment of Relational Skills. Autism. 2013 Oct 9PMID: 24108192; X-5
2054. Charbonneau G, Bertone A, Lepore F, et al. Multilevel alterations in the processing of audio-visual emotion expressions in autism spectrum disorders. Neuropsychologia. 2013 Apr;51(5):1002-10. PMID: 23462241; X-5

2055. Charlot L, Beasley JB. Intellectual Disabilities and Mental Health: United States-Based Research. Journal of Mental Health Research in Intellectual Disabilities. 2013 2013;6(2):74-105. X-5
2056. Cheak-Zamora NC, Yang X, Farmer JE, et al. Disparities in transition planning for youth with autism spectrum disorder. Pediatrics. 2013 Mar;131(3):447-54. PMID: 23400613; X-5
2057. Chen YW, Cordier R, Brown N. A preliminary study on the reliability and validity of using experience sampling method in children with autism spectrum disorders. Dev Neurorehabil. 2013 Dec 4PMID: 24304202; X-3, X-5
2058. Cheremshynski C, Lucyshyn JM, Olson DL. Implementation of a culturally appropriate positive behavior support plan with a japanese mother of a child with autism: An experimental and qualitative analysis. Journal of Positive Behavior Interventions. 2013;15(4):242-53. X-3
2059. Cheung G, Trembath D, Arciuli J, et al. The impact of workplace factors on evidence-based speech-language pathology practice for children with autism spectrum disorders. International Journal of Speech-Language Pathology. 2013;15(4):396-406. X-5
2060. Chiu AW, Langer DA, McLeod BD, et al. Effectiveness of modular CBT for child anxiety in elementary schools. Sch Psychol Q. 2013 Jun;28(2):141-53. PMID: 23750860; X-5
2061. Choi KYK, Kovshoff H. Do maternal attributions play a role in the acceptability of behavioural interventions for problem behaviour in children with autism spectrum disorders? Research in Autism Spectrum Disorders. 2013;7(8):984-96. X-4
2062. Chok JT, Koesler B. Distinguishing Obsessive-Compulsive Behavior From Stereotypy: A Preliminary Investigation. Behav Modif. 2013 Oct 31PMID: 24177034; X-3, X-5
2063. Christ JB, Fruhmann Berger M, Riedl E, et al. How precise are activities of daily living scales for the diagnosis of Parkinson's disease dementia? A pilot study. Parkinsonism Relat Disord. 2013 Mar;19(3):371-4. PMID: 23231974; X-5
2064. Christensen J, Gronborg TK, Sorensen MJ, et al. Prenatal valproate exposure and risk of autism spectrum disorders and childhood autism. JAMA. 2013 Apr 24;309(16):1696-703. PMID: 23613074; X-5
2065. Cidav Z, Lawer L, Marcus SC, et al. Age-related variation in health service use and associated expenditures among children with autism. Journal of Autism and Developmental Disorders. 2013;43(4):924-31. X-5
2066. Clay CJ, Samaha AL, Bloom SE, et al. Assessing preference for social interactions. Res Dev Disabil. 2013 Jan;34(1):362-71. PMID: 23009945; X-3, X-5
2067. Clifford T, Minnes P. Logging on: evaluating an online support group for parents of children with autism spectrum disorders. J Autism Dev Disord. 2013 Jul;43(7):1662-75. PMID: 23143075; X-5
2068. Clopper CG, Rohrbeck KL, Wagner L. Perception of talker age by young adults with high-functioning autism. J Autism Dev Disord. 2013 Jan;43(1):134-46. PMID: 22638967; X-5
2069. Coffman MC, Anderson LC, Naples AJ, et al. Sex Differences in Social Perception in Children with ASD. J Autism Dev Disord. 2013 Nov 30PMID: 24293083; X-5
2070. Cohen D, Raffin M, Canitano R, et al. Risperidone or Aripiprazole in Children and Adolescents with Autism and/or Intellectual Disability: A Bayesian Meta-Analysis of Efficacy and Secondary Effects. Research in Autism Spectrum Disorders. 2013 January 2013;7(1):167-75. X-1, X-3
2071. Cohen JP, Ruha AM, Curry SC, et al. Plasma and urine dimercaptopropanesulfonate concentrations after dermal application of transdermal DMPS (TD-DMPS). J Med Toxicol. 2013 Mar;9(1):9-15. PMID: 23143832; X-5
2072. Coman D, Alessandri M, Gutierrez A, et al. Commitment to Classroom Model Philosophy and Burnout Symptoms among High Fidelity Teachers Implementing Preschool Programs for Children with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders. 2013;43(2):345-60. X-5
2073. Conner CM, Maddox BB, White SW. Parents' state and trait anxiety: Relationships with anxiety severity and treatment response in adolescents with autism spectrum disorders. Journal of Autism and Developmental Disorders. 2013;43(8):1811-8. X-5
2074. Consoli A, Cohen J, Bodeau N, et al. Electroconvulsive therapy in adolescents with intellectual disability and severe self-injurious behavior and aggression: A retrospective study. European Child & Adolescent Psychiatry. 2013;22(1):55-62. X-3, X-5
2075. Constable S, Grossi B, Moniz A, et al. Meeting the Common Core State Standards for Students with Autism: The Challenge for Educators. TEACHING Exceptional Children. 2013 2013;45(3):6-13. X-5
2076. Corbett BA, Swain DM, Coke C, et al. Improvement in Social Deficits in Autism Spectrum Disorders Using a Theatre-Based, Peer-Mediated Intervention. Autism Res. 2013 Oct 22PMID: 24150989; X-5
2077. Crais ER, Watson LR. Challenges and opportunities in early identification and intervention for children at-risk for autism spectrum disorders. Int J Speech Lang Pathol. 2013 Dec 13PMID: 24328367; X-5

2078. Dadds MR, Macdonald E, Cauchi A, et al. Nasal Oxytocin for Social Deficits in Childhood Autism: A Randomized Controlled Trial. J Autism Dev Disord. 2013 Jul 26PMID: 23888359; X-1, X-3
2079. Dalsgaard S, Nielsen HS, Simonsen M. Five-fold increase in national prevalence rates of attention-deficit/hyperactivity disorder medications for children and adolescents with autism spectrum disorder, attention-deficit/hyperactivity disorder, and other psychiatric disorders: A Danish register-based study. Journal of Child and Adolescent Psychopharmacology. 2013;23(7):432-9. X-5
2080. Daniels AM, Mandell DS. Children's compliance with American Academy of Pediatrics' well-child care visit guidelines and the early detection of autism. Journal of Autism and Developmental Disorders. 2013;43(12):2844-54. X-5
2081. Daniels AM, Mandell DS. Explaining differences in age at autism spectrum disorder diagnosis: A critical review. Autism. 2013 Jun 20PMID: 23787411; X-5
2082. Davidson C, Greenwood N, Stansfield A, et al. Prevalence of Asperger syndrome among patients of an Early Intervention in Psychosis team. Early Interv Psychiatry. 2013 Mar 8PMID: 23472601; X-5
2083. Davis TN, O'Reilly M, Kang S, et al. Chelation Treatment for Autism Spectrum Disorders: A Systematic Review. Research in Autism Spectrum Disorders. 2013 January 2013;7(1):49-55. X-5
2084. Dawson G. Early intensive behavioral intervention appears beneficial for young children with autism spectrum disorders. J Pediatr. 2013 May;162(5):1080-1. PMID: 23617979; X-1, X-2, X-3, X-4
2085. de Bartolomeis A, Latte G, Tomasetti C, et al. Glutamatergic Postsynaptic Density Protein Dysfunctions in Synaptic Plasticity and Dendritic Spines Morphology: Relevance to Schizophrenia and Other Behavioral Disorders Pathophysiology, and Implications for Novel Therapeutic Approaches. Mol Neurobiol. 2013 Sep 3PMID: 23999870; X-5
2086. de Boer A, Pijl SJ, Minnaert A, et al. Evaluating the Effectiveness of an Intervention Program to Influence Attitudes of Students Towards Peers with Disabilities. J Autism Dev Disord. 2013 Aug 28PMID: 23982486; X-5
2087. de Theije CG, Bavelaar BM, Lopes da Silva S, et al. Food allergy and food-based therapies in neurodevelopmental disorders. Pediatr Allergy Immunol. 2013 Nov 17PMID: 24236934; X-5
2088. Deakin J, Lennox B. Psychotic symptoms in young people warrant urgent referral. Practitioner. 2013 Mar;257(1759):25-8, 3. PMID: 23634636; X-5
2089. Del'guidice T, Lemay F, Lemasson M, et al. Stimulation of 5-HT Receptors Improves Cognitive Deficits Induced by Human Tryptophan Hydroxylase 2 Loss of Function Mutation. Neuropsychopharmacology. 2013 Nov 7PMID: 24196946; X-5
2090. D'Elia L, Valeri G, Sonnino F, et al. A Longitudinal Study of the Teacch Program in Different Settings: The Potential Benefits of Low Intensity Intervention in Preschool Children with Autism Spectrum Disorder. J Autism Dev Disord. 2013 Aug 15PMID: 23949000; X-5
2091. Demurie E, Roeyers H, Baeyens D, et al. Domain-General and Domain-Specific Aspects of Temporal Discounting in Children with ADHD and Autism Spectrum Disorders (ASD): A Proof of Concept Study. Research in Developmental Disabilities: A Multidisciplinary Journal. 2013 June 2013;34(6):1870-80. X-1, X-3
2092. Dezfoolian L, Zarei M, Ashayeri H, et al. A pilot study on the effects of Orff-based therapeutic music in children with autism spectrum disorder. Music and Medicine. 2013;5(3):162-8. X-3
2093. Di Pietro NC, Whiteley L, Mizgalewicz A, et al. Treatments for neurodevelopmental disorders: Evidence, advocacy, and the Internet. Journal of Autism and Developmental Disorders. 2013;43(1):122-33. X-5
2094. Dixon G, Clarke C. The effect of falsely balanced reporting of the autism–vaccine controversy on vaccine safety perceptions and behavioral intentions. Health Education Research. 2013;28(2):352-9. X-5
2095. Doggett RA, Krasno AM, Koegel LK, et al. Acquisition of multiple questions in the context of social conversation in children with autism. Journal of Autism and Developmental Disorders. 2013;43(9):2015-25. X-3, X-4
2096. Domes G, Heinrichs M, Kumbier E, et al. Effects of intranasal oxytocin on the neural basis of face processing in autism spectrum disorder. Biol Psychiatry. 2013 Aug 1;74(3):164-71. PMID: 23510581; X-1, X-3
2097. Douglas JF, Sanders KB, Benneyworth MH, et al. Brief report: Retrospective case series of oxcarbazepine for irritability/agitation symptoms in autism spectrum disorder. Journal of Autism and Developmental Disorders. 2013;43(5):1243-7. X-1
2098. Duffy FH, Eksioglu YZ, Rotenberg A, et al. The frequency modulated auditory evoked response (FMAER), a technical advance for study of childhood language disorders: cortical source localization and selected case studies. BMC Neurol. 2013;13:12. PMID: 23351174; X-5
2099. Eack SM, Bahorik AL, Hogarty SS, et al. Brief report: Is cognitive rehabilitation needed in verbal adults with autism? Insights from initial enrollment in a trial of cognitive enhancement therapy. Journal of Autism and Developmental Disorders. 2013;43(9):2233-7. X-5

2100. Eack SM, Greenwald DP, Hogarty SS, et al. Cognitive enhancement therapy for adults with autism spectrum disorder: Results of an 18-month feasibility study. Journal of Autism and Developmental Disorders. 2013;43(12):2866-77. X-5
2101. Eapen V, Crncec R, Walter A. Clinical outcomes of an early intervention program for preschool children with Autism Spectrum Disorder in a community group setting. BMC Pediatr. 2013;13(1):3. PMID: 23294523; X-5
2102. Eapen V, Crncec R, Walter A. Exploring Links between Genotypes, Phenotypes, and Clinical Predictors of Response to Early Intensive Behavioral Intervention in Autism Spectrum Disorder. Front Hum Neurosci. 2013;7:567. PMID: 24062668; X-2, X-5
2103. Egan AM, Dreyer ML, Odar CC, et al. Obesity in young children with autism spectrum disorders: prevalence and associated factors. Child Obes. 2013 Apr;9(2):125-31. PMID: 23485020; X-5
2104. Eikeseth S, Smith DP. An analysis of verbal stimulus control in intraverbal behavior: implications for practice and applied research. Anal Verbal Behav. 2013;29(1):125-35. PMID: 23814373; X-5
2105. El Zein F, Solis M, Vaughn S, et al. Reading Comprehension Interventions for Students with Autism Spectrum Disorders: A Synthesis of Research. J Autism Dev Disord. 2013 Nov 12PMID: 24218240; X-5
2106. El-Baz F, Hamza RT, Ayad MS, et al. Hyperandrogenemia in male autistic children and adolescents: relation to disease severity. Int J Adolesc Med Health. 2013 Apr 20:1-6. PMID: 23612632; X-5
2107. Eldevik S, Ondire I, Hughes JC, et al. Effects of computer simulation training on in vivo discrete trial teaching. J Autism Dev Disord. 2013 Mar;43(3):569-78. PMID: 22790382; X-5
2108. Ellis Weismer S. Developmental Language Disorders: Challenges and Implications of Cross-Group Comparisons. Folia Phoniatr Logop. 2013 Aug 12;65(2):68-77. PMID: 23942044; X-5
2109. Emerson A, Dearden J. Accommodating to motor difficulties and communication impairments in people with autism: the MORE intervention model. Front Integr Neurosci. 2013;7:45. PMID: 23785315; X-1, X-2, X-3, X-4
2110. Enticott PG, Fitzgibbon BM, Kennedy HA, et al. A Double-blind, Randomized Trial of Deep Repetitive Transcranial Magnetic Stimulation (rTMS) for Autism Spectrum Disorder. Brain Stimul. 2013 Oct 27PMID: 24280031; X-5
2111. Enticott PG, Kennedy HA, Rinehart NJ, et al. Interpersonal motor resonance in autism spectrum disorder: Evidence against a global "mirror system" deficit. Frontiers in Human Neuroscience. 2013; X-5
2112. Enticott PG, Kennedy HA, Rinehart NJ, et al. GABAergic activity in autism spectrum disorders: An investigation of cortical inhibition via transcranial magnetic stimulation. Neuropharmacology. 2013;68:202-9. X-5
2113. Erickson CA, Wink LK, Early MC, et al. Brief Report: Pilot Single-Blind Placebo Lead-In Study of Acamprosate in Youth with Autistic Disorder. J Autism Dev Disord. 2013 Sep 20PMID: 24052275; X-5
2114. Eriksson MA, Westerlund J, Hedvall A, et al. Medical conditions affect the outcome of early intervention in preschool children with autism spectrum disorders. Eur Child Adolesc Psychiatry. 2013 Jan;22(1):23-33. PMID: 22836733; X-5
2115. Essa MM, Subash S, Braidy N, et al. Role of NAD(+), Oxidative Stress, and Tryptophan Metabolism in Autism Spectrum Disorders. Int J Tryptophan Res. 2013;6(Suppl 1):15-28. PMID: 23922500; X-5
2116. Estes A, Olson E, Sullivan K, et al. Parenting-related stress and psychological distress in mothers of toddlers with autism spectrum disorders. Brain Dev. 2013 Feb;35(2):133-8. PMID: 23146332; X-5
2117. Evans B. How autism became autism: The radical transformation of a central concept of child development in Britain. Hist Human Sci. 2013 Jul;26(3):3-31. PMID: 24014081; X-5
2118. Fahmy SF, El-hamamsy MH, Zaki OK, et al. L-Carnitine supplementation improves the behavioral symptoms in autistic children. Research in Autism Spectrum Disorders. 2013;7(1):159-66. X-5
2119. Farmer JE, Clark MJ, Mayfield WA, et al. The Relationship Between the Medical Home and Unmet Needs for Children with Autism Spectrum Disorders. Matern Child Health J. 2013 Jun 23PMID: 23793533; X-5
2120. Feinberg E, Augustyn M, Fitzgerald E, et al. Improving Maternal Mental Health After a Child's Diagnosis of Autism Spectrum Disorder: Results From a Randomized Clinical Trial. JAMA Pediatr. 2013 Nov 11PMID: 24217336; X-5
2121. Feinberg E, Silverstein M, Ferreira-Cesar Z. Integrating mental health services for mothers of children with autism. Psychiatric Services. 2013;64(9):930. X-5
2122. Fernández-Jaén A, Fernández-Mayoralas DM, Calleja-Pérez B, et al. Efficacy of atomoxetine for the treatment of ADHD symptoms in patients with pervasive developmental disorders: A prospective, open-label study. Journal of Attention Disorders. 2013;17(6):497-505. X-5
2123. Fernell E, Eriksson MA, Gillberg C. Early diagnosis of autism and impact on prognosis: a narrative review. Clin Epidemiol. 2013;5:33-43. PMID: 23459124; X-1, X-2, X-3, X-4
2124. Ferraioli SJ, Harris SL. Comparative effects of mindfulness and skills-based parent training programs for parents of children with autism: Feasibility and preliminary outcome data. Mindfulness. 2013;4(2):89-101. X-5

2125. Fisher WW, Rodriguez NM, Owen TM. Functional assessment and treatment of perseverative speech about restricted topics in an adolescent with Asperger syndrome. Journal of Applied Behavior Analysis. 2013;46(1):307-11. X-1, X-3, X-5
2126. Flechas J. Jorge Flechas, MD: the potential of oxytocin, nitric oxide, and iodine. Altern Ther Health Med. 2013 Jul-Aug;19(4):50-6. PMID: 23981372; X-1, X-2, X-3, X-4
2127. Foster L, Dunn W, Lawson LM. Coaching Mothers of Children with Autism: A Qualitative Study for Occupational Therapy Practice. Physical & Occupational Therapy in Pediatrics. 2013 May 2013;33(2):253-63. X-1, X-3, X-4, X-5
2128. Foxe JJ, Molholm S, Del Bene VA, et al. Severe Multisensory Speech Integration Deficits in High-Functioning School-Aged Children with Autism Spectrum Disorder (ASD) and Their Resolution During Early Adolescence. Cereb Cortex. 2013 Aug 28PMID: 23985136; X-1, X-4
2129. Franklin AV, King MK, Palomo V, et al. Glycogen Synthase Kinase-3 Inhibitors Reverse Deficits in Long-term Potentiation and Cognition in Fragile X Mice. Biol Psychiatry. 2013 Sep 13PMID: 24041505; X-5
2130. Franz DN. Everolimus in the treatment of subependymal giant cell astrocytomas, angiomyolipomas, and pulmonary and skin lesions associated with tuberous sclerosis complex. Biologics. 2013;7:211-21. PMID: 24143074; X-5
2131. Freitag CM, Cholemkery H, Elsuni L, et al. The group-based social skills training SOSTA-FRA in children and adolescents with high functioning autism spectrum disorder--study protocol of the randomised, multi-centre controlled SOSTA--net trial. Trials. 2013;14:6. PMID: 23289935; X-1, X-2, X-3, X-4, X-5
2132. Frenette P, Dodds L, MacPherson K, et al. Factors affecting the age at diagnosis of autism spectrum disorders in Nova Scotia, Canada. Autism. 2013 Mar;17(2):184-95. PMID: 21788254; X-5
2133. Freuler AC, Baranek GT, Tashjian C, et al. Parent reflections of experiences of participating in a randomized controlled trial of a behavioral intervention for infants at risk of autism spectrum disorders. Autism. 2013 Oct 8PMID: 24104508; X-4
2134. Frohlich J, Van Horn JD. Reviewing the ketamine model for schizophrenia. J Psychopharmacol. 2013 Nov 20PMID: 24257811; X-5
2135. Frye RE, DeLatorre R, Taylor HB, et al. Metabolic effects of sapropterin treatment in autism spectrum disorder: a preliminary study. Transl Psychiatry. 2013;3:e237. PMID: 23462988; X-3
2136. Frye RE, Melnyk S, Fuchs G, et al. Effectiveness of methylcobalamin and folinic Acid treatment on adaptive behavior in children with autistic disorder is related to glutathione redox status. Autism Res Treat. 2013;2013:609705. PMID: 24224089; X-5
2137. Frye RE, Rossignol D, Casanova MF, et al. A Review of Traditional and Novel Treatments for Seizures in Autism Spectrum Disorder: Findings from a Systematic Review and Expert Panel. Front Public Health. 2013;1:31. PMID: 24350200; X-5
2138. Frye RE, Sequeira JM, Quadros EV, et al. Cerebral folate receptor autoantibodies in autism spectrum disorder. Molecular Psychiatry. 2013;18(3):369-81. X-5
2139. Gal E, Ben Meir A, Katz N. Development and reliability of the Autism Work Skills Questionnaire (AWSQ). Am J Occup Ther. 2013 Jan-Feb;67(1):e1-5. PMID: 23245792; X-5
2140. Gan SM, Tung LC, Yeh CH, et al. The ICF-CY-based structural equation model of factors associated with participation in children with autism. Dev Neurorehabil. 2013 Oct 2PMID: 24087923; X-5
2141. Gan SM, Tung LC, Yeh CY, et al. ICF-CY based assessment tool for children with autism. Disabil Rehabil. 2013 Apr;35(8):678-85. PMID: 22897818; X-5
2142. Ganz JB, Hong ER, Goodwyn F, et al. Impact of PECS tablet computer app on receptive identification of pictures given a verbal stimulus. Dev Neurorehabil. 2013 Aug 19PMID: 23957298; X-3
2143. Ganz JB, Rispoli MJ, Mason RA, et al. Moderation of effects of AAC based on setting and types of aided AAC on outcome variables: An aggregate study of single-case research with individuals with ASD. Dev Neurorehabil. 2013 Oct 8PMID: 24102440; X-5
2144. Geier DA, Kern JK, Geier MR. A Comparison of the Autism Treatment Evaluation Checklist (ATEC) and the Childhood Autism Rating Scale (CARS) for the Quantitative Evaluation of Autism. J Ment Health Res Intellect Disabil. 2013 Oct;6(4):255-67. PMID: 23914277; X-5
2145. Gentile I, Bravaccio C, Bonavolta R, et al. Response to measles-mumps-rubella vaccine in children with autism spectrum disorders. In Vivo. 2013 May-Jun;27(3):377-82. PMID: 23606694; X-5
2146. Georgiades S, Szatmari P, Boyle M, et al. Investigating phenotypic heterogeneity in children with autism spectrum disorder: A factor mixture modeling approach. Journal of Child Psychology and Psychiatry. 2013;54(2):206-15. X-5

2147. Gershon ES, Grennan K, Busnello J, et al. A rare mutation of CACNA1C in a patient with bipolar disorder, and decreased gene expression associated with a bipolar-associated common SNP of CACNA1C in brain. Mol Psychiatry. 2013 Aug 27PMID: 23979604; X-5
2148. Ghaleiha A, Asadabadi M, Mohammadi MR, et al. Memantine as adjunctive treatment to risperidone in children with autistic disorder: a randomized, double-blind, placebo-controlled trial. Int J Neuropsychopharmacol. 2013 May;16(4):783-9. PMID: 22999292; X-5
2149. Ghaleiha A, Ghyasvand M, Mohammadi MR, et al. Galantamine efficacy and tolerability as an augmentative therapy in autistic children: A randomized, double-blind, placebo-controlled trial. J Psychopharmacol. 2013 Oct 15PMID: 24132248; X-5
2150. Ghanizadeh A, Moghimi-Sarani E. A randomized double blind placebo controlled clinical trial of N-Acetylcysteine added to risperidone for treating autistic disorders. BMC Psychiatry. 2013;13:196. PMID: 23886027; X-5
2151. Gillespie-Smith K, Riby DM, Hancock PJ, et al. Children with autism spectrum disorder (ASD) attend typically to faces and objects presented within their picture communication systems. J Intellect Disabil Res. 2013 Apr 19PMID: 23600472; X-1, X-3, X-4
2152. Goetz CG, Stebbins GT, Chung KA, et al. Which dyskinesia scale best detects treatment response? Mov Disord. 2013 Mar;28(3):341-6. PMID: 23390076; X-5
2153. Gokey KM, Wilder DA, Welch T, et al. Fading a concurrent activity during self-control training for children with autism. J Appl Behav Anal. 2013 Aug 12PMID: 24114520; X-3
2154. Goldingay S, Stagnitti K, Sheppard L, et al. An intervention to improve social participation for adolescents with autism spectrum disorder: Pilot study. Dev Neurorehabil. 2013 Nov 8PMID: 24206240; X-5
2155. Goldman LE, Chu PW, Osmond D, et al. Accuracy of do not resuscitate (DNR) in administrative data. Med Care Res Rev. 2013 Feb;70(1):98-112. PMID: 22955698; X-5
2156. Golubchik P, Sever J, Weizman A. Reboxetine treatment for autistic spectrum disorder of pediatric patients with depressive and inattentive/hyperactive symptoms: An open-label trial. Clinical Neuropharmacology. 2013;36(2):37-41. X-1, X-3, X-5
2157. Graf-Myles J, Farmer C, Thurm A, et al. Dietary adequacy of children with autism compared with controls and the impact of restricted diet. Journal of Developmental and Behavioral Pediatrics. 2013;34(7):449-59. X-5
2158. Granovetter M. Let's talk therapy: treatments for children with autism. Lancet. 2013 Aug 31;382(9894):753. PMID: 23993177; X-1, X-2, X-3, X-4
2159. Grant PJ, Joseph LA, Farmer CA, et al. 12-Week Placebo-Controlled Trial of Add-on Riluzole in the Treatment of Childhood-Onset Obsessive Compulsive Disorder. Neuropsychopharmacology. 2013 Dec 19PMID: 24356715; X-1, X-3
2160. Grether JK, Qian Y, Croughan MS, et al. Is infertility associated with childhood autism? J Autism Dev Disord. 2013 Mar;43(3):663-72. PMID: 22777105; X-5
2161. Grodberg D, Weinger PM, Halpern D, et al. The Autism Mental Status Exam: Sensitivity and Specificity Using DSM-5 Criteria for Autism Spectrum Disorder in Verbally Fluent Adults. J Autism Dev Disord. 2013 Aug 29PMID: 23989909; X-5
2162. Grondhuis SN, Aman MG. Overweight and obesity in youth with developmental disabilities: a call to action. J Intellect Disabil Res. 2013 Sep 10PMID: 24020517; X-5
2163. Grynszpan O, Weiss PL, Perez-Diaz F, et al. Innovative technology-based interventions for autism spectrum disorders: A meta-analysis. Autism. 2013 Oct 3PMID: 24092843; X-1
2164. Guevara JP, Gerdes M, Localio R, et al. Effectiveness of developmental screening in an urban setting. Pediatrics. 2013 Jan;131(1):30-7. PMID: 23248223; X-3, X-4, X-5
2165. Gunn KS, Trembath D, Hudry K. An examination of interactions among children with autism and their typically developing peers. Dev Neurorehabil. 2013 Jul 19PMID: 23869995; X-4
2166. Hadjikhani N, Zurcher NR, Rogier O, et al. Improving emotional face perception in autism with diuretic bumetanide: A proof-of-concept behavioral and functional brain imaging pilot study. Autism. 2013 Dec 16PMID: 24343334; X-1, X-3
2167. Hammond RK, Campbell JM, Ruble LA. Considering Identification and Service Provision for Students with Autism Spectrum Disorders within the Context of Response to Intervention. Exceptionality. 2013;21(1):34-50. X-5
2168. Hanney NM, Jostad CM, LeBlanc LA, et al. Intensive behavioral treatment of urinary incontinence of children with autism spectrum disorders: An archival analysis of procedures and outcomes from an outpatient clinic. Focus on Autism and Other Developmental Disabilities. 2013;28(1):26-31. X-5
2169. Hardy MW, Lagasse AB. Rhythm, movement, and autism: using rhythmic rehabilitation research as a model for autism. Front Integr Neurosci. 2013;7:19. PMID: 23543915; X-5

2170. Harfterkamp M, Buitelaar JK, Minderaa RB, et al. Long-term treatment with atomoxetine for attention-deficit/hyperactivity disorder symptoms in children and adolescents with autism spectrum disorder: An open-label extension study. Journal of Child and Adolescent Psychopharmacology. 2013;23(3):194-9. X-5
2171. Harris B, Barton EE, Albert C. Evaluating Autism Diagnostic and Screening Tools for Cultural and Linguistic Responsiveness. J Autism Dev Disord. 2013 Nov 2PMID: 24186120; X-5
2172. Harrop C, McConachie H, Emsley R, et al. Restricted and Repetitive Behaviors in Autism Spectrum Disorders and Typical Development: Cross-Sectional and Longitudinal Comparisons. J Autism Dev Disord. 2013 Nov 14PMID: 24234675; X-5
2173. Hazen EP, McDougle CJ, Volkmar FR. Changes in the diagnostic criteria for autism in DSM-5: controversies and concerns. J Clin Psychiatry. 2013 Jul;74(7):739-40. PMID: 23945452; X-1, X-2, X-3, X-4
2174. Hebron J, Humphrey N. Exposure to bullying among students with autism spectrum conditions: A multi-informant analysis of risk and protective factors. Autism. 2013 Jul 25PMID: 23886576; X-5
2175. Hedvall A, Westerlund J, Fernell E, et al. Autism and developmental profiles in preschoolers: stability and change over time. Acta Paediatr. 2013 Oct 8PMID: 24237479; X-4
2176. Henninger NA, Taylor JL. Outcomes in Adults with Autism Spectrum Disorders: A Historical Perspective. Autism: The International Journal of Research and Practice. 2013 January 2013;17(1):103-16. X-5
2177. Henriksen N, Peterson S. Behavioral treatment of bedwetting in an adolescent with autism. Journal of Developmental and Physical Disabilities. 2013;25(3):313-23. X-3, X-5
2178. Hesselmark E, Plenty S, Bejerot S. Group cognitive behavioural therapy and group recreational activity for adults with autism spectrum disorders: A preliminary randomized controlled trial. Autism. 2013 Nov 8PMID: 24089423; X-5
2179. Hill DA, Belcher L, Brigman HE, et al. The Apple iPad TM as an innovative employment support for young adults with autism spectrum disorder and other developmental disabilities. Journal of Applied Rehabilitation Counseling. 2013;44(1):28-37. X-5
2180. Himuro N, Kozuka N, Mori M. Measurement of family-centred care: translation, adaptation and validation of the Measure of Processes of Care (MPOC-56 and -20) for use in Japan. Child Care Health Dev. 2013 May;39(3):358-65. PMID: 22372945; X-5
2181. Hinckson EA, Dickinson A, Water T, et al. Physical activity, dietary habits and overall health in overweight and obese children and youth with intellectual disability or autism. Res Dev Disabil. 2013 Apr;34(4):1170-8. PMID: 23400004; X-1, X-3, X-4
2182. Hines M, Balandin S, Togher L. The Stories of Older Parents of Adult Sons and Daughters with Autism: A Balancing Act. J Appl Res Intellect Disabil. 2013 Jun 17PMID: 23775710; X-5
2183. Hinton R, Budimirovic DB, Marschik PB, et al. Parental reports on early language and motor milestones in fragile X syndrome with and without autism spectrum disorders. Dev Neurorehabil. 2013;16(1):58-66. PMID: 23249372; X-5
2184. Holloway R. On Emerging from Autism and into the Terror of Relationships. Journal of Child Psychotherapy. 2013;39(1):39-58. X-5
2185. Holm MB, Baird JM, Kim YJ, et al. Therapeutic Horseback Riding Outcomes of Parent-Identified Goals for Children with Autism Spectrum Disorder: An ABA' Multiple Case Design Examining Dosing and Generalization to the Home and Community. J Autism Dev Disord. 2013 Oct 4PMID: 24091469; X-3
2186. Horbrand F, Bramlage P, Fischaleck J, et al. A population-based study comparing biosimilar versus originator erythropoiesis-stimulating agent consumption in 6,117 patients with renal anaemia. Eur J Clin Pharmacol. 2013 Apr;69(4):929-36. PMID: 23052412; X-5
2187. Hosenbocus S, Chahal R. Memantine: a review of possible uses in child and adolescent psychiatry. J Can Acad Child Adolesc Psychiatry. 2013 May;22(2):166-71. PMID: 23667364; X-1, X-2, X-3, X-4
2188. Hsia Y, Wong AY, Murphy DG, et al. Psychopharmacological prescriptions for people with autism spectrum disorder (ASD): a multinational study. Psychopharmacology (Berl). 2013 Sep 5PMID: 24005531; X-4
2189. Hsieh YL, Lo JL. Occupational experiences and subjective well-being of mothers of children with ASD in Taiwan. Occupational Therapy International. 2013;20(1):45-53. X-5
2190. Hu X, Zhang J, Jin C, et al. Association study of NRXN3 polymorphisms with schizophrenia and risperidone-induced bodyweight gain in Chinese Han population. Prog Neuropsychopharmacol Biol Psychiatry. 2013 Jun 3;43:197-202. PMID: 23306218; X-5
2191. Hua X, Thompson PM, Leow AD, et al. Brain growth rate abnormalities visualized in adolescents with autism. Hum Brain Mapp. 2013 Feb;34(2):425-36. PMID: 22021093; X-5
2192. Huang CY, Yen HC, Tseng MH, et al. Impacts of Autistic Behaviors, Emotional and Behavioral Problems on Parenting Stress in Caregivers of Children with Autism. J Autism Dev Disord. 2013 Nov 28PMID: 24287878; X-5

2193. Huang H, Michetti C, Busnelli M, et al. Chronic and Acute Intranasal Oxytocin Produce Divergent Social Effects in Mice. Neuropsychopharmacology. 2013 Nov 4PMID: 24190025; X-5
2194. Hughes C, Harvey M, Cosgriff J, et al. A Peer-Delivered Social Interaction Intervention for High School Students with Autism. Research and Practice for Persons with Severe Disabilities. 2013 2013;38(1):1-16. X-5
2195. Huke V, Turk J, Saeidi S, et al. The Clinical Implications of High Levels of Autism Spectrum Disorder Features in Anorexia Nervosa: A Pilot Study. Eur Eat Disord Rev. 2013 Nov 26PMID: 24277715; X-5
2196. Humble MB, Uvnas-Moberg K, Engstrom I, et al. Plasma oxytocin changes and anti-obsessive response during serotonin reuptake inhibitor treatment: a placebo controlled study. BMC Psychiatry. 2013 Dec 23;13(1):344. PMID: 24359174; X-5
2197. Hutchins TL, Prelock PA. The social validity of Social StoriesTM for supporting the behavioural and communicative functioning of children with autism spectrum disorder. International Journal of Speech-Language Pathology. 2013;15(4):383-95. X-5
2198. Ibrahim KS, El-Sayed EM. Proposed remedies for some developmental disorders. Toxicol Ind Health. 2013 May;29(4):367-84. PMID: 22301819; X-1, X-2, X-3, X-4
2199. Imaizumi Y, Okano H. Modeling human neurological disorders with induced pluripotent stem cells. J Neurochem. 2013 Nov 29PMID: 24286589; X-5
2200. Imbrici P, Camerino DC, Tricarico D. Major channels involved in neuropsychiatric disorders and therapeutic perspectives. Front Genet. 2013;4:76. PMID: 23675382; X-5
2201. Iskander JM, Rosales R. An evaluation of the components of a Social StoriesTM intervention package. Research in Autism Spectrum Disorders. 2013;7(1):1-8. X-3
2202. Iwanaga R, Honda S, Nakane H, et al. Pilot Study: Efficacy of Sensory Integration Therapy for Japanese Children with High-Functioning Autism Spectrum Disorder. Occup Ther Int. 2013 Jul 25PMID: 23893373; X-5
2203. Jacob J, Ribes V, Moore S, et al. Valproic Acid silencing of ascl1b/ascl1 results in the failure of serotonergic differentiation in a zebrafish model of Fetal Valproate Syndrome. Dis Model Mech. 2013 Oct 17PMID: 24135485; X-5
2204. Jain R, Juneja M, Sairam S. Children with developmental disabilities in India: Age of initial concern and referral for rehabilitation services, and reasons for delay in referral. Journal of Child Neurology. 2013;28(4):455-60. X-5
2205. Jenkins SR, DiGennaro Reed FD. An experimental analysis of the effects of therapeutic horseback riding on the behavior of children with autism. Research in Autism Spectrum Disorders. 2013;7(6):721-40. X-3
2206. Jeon SJ, Kim JW, Kim KC, et al. Translational Regulation of NeuroD1 Expression by FMRP: Involvement in Glutamatergic Neuronal Differentiation of Cultured Rat Primary Neural Progenitor Cells. Cell Mol Neurobiol. 2013 Dec 12PMID: 24338128; X-5
2207. Jerrell JM, Hrisko S. A comparison of the PANSS pentagonal and Van Der Gaag 5-factor models for assessing change over time. Psychiatry Res. 2013 May 15;207(1-2):134-9. PMID: 23313304; X-5
2208. Jin CS, Hanley GP, Beaulieu L. An individualized and comprehensive approach to treating sleep problems in young children. Journal of Applied Behavior Analysis. 2013;46(1):161-80. X-3
2209. Jones EJ, Gliga T, Bedford R, et al. Developmental pathways to autism: A review of prospective studies of infants at risk. Neurosci Biobehav Rev. 2013 Dec 18PMID: 24361967; X-5
2210. Joshi G, Wozniak J, Petty C, et al. Psychiatric Comorbidity and Functioning in a Clinically Referred Population of Adults with Autism Spectrum Disorders: A Comparative Study. Journal of Autism and Developmental Disorders. 2013 June 2013;43(6):1314-25. X-5
2211. Jung NH, Janzarik WG, Delvendahl I, et al. Impaired induction of long-term potentiation-like plasticity in patients with high-functioning autism and Asperger syndrome. Developmental Medicine & Child Neurology. 2013;55(1):83-9. X-5
2212. Jung S, Sainato DM. Teaching Play Skills to Young Children with Autism. Journal of Intellectual & Developmental Disability. 2013 March 2013;38(1):74-90. X-1, X-2, X-3, X-4
2213. Kaat AJ, Lecavalier L, Aman MG. Validity of the Aberrant Behavior Checklist in Children with Autism Spectrum Disorder. J Autism Dev Disord. 2013 Oct 29PMID: 24165702; X-5
2214. Kaiser AP, Roberts MY. Parent-implemented enhanced milieu teaching with preschool children who have intellectual disabilities. Journal of Speech, Language, and Hearing Research. 2013;56(1):295-309. X-3
2215. Kajiume A, Aoyama-Setoyama S, Saito-Hori Y, et al. Reduced brain activation during imitation and observation of others in children with pervasive developmental disorder: A pilot study. Behavioral and Brain Functions. 2013;9. X-5
2216. Kakooza-Mwesige A, Ssebyala K, Karamagi C, et al. Adaptation of the 'ten questions' to screen for autism and other neuro-developmental disorders in Uganda. Autism. 2013 Nov 8PMID: 23536263; X-5

2217. Kaluzna-Czaplinska J, Zurawicz E, Jozwik J. Chromatographic techniques coupled with mass spectrometry for the determination of organic acids in the study of autism. J Chromatogr B Analyt Technol Biomed Life Sci. 2013 Oct 22PMID: 24210941; X-5
2218. Kamio Y, Inada N, Koyama T. A Nationwide Survey on Quality of Life and Associated Factors of Adults with High-Functioning Autism Spectrum Disorders. Autism: The International Journal of Research and Practice. 2013 January 2013;17(1):15-26. X-5
2219. Kandalaft MR, Didehbani N, Krawczyk DC, et al. Virtual reality social cognition training for young adults with high-functioning autism. J Autism Dev Disord. 2013 Jan;43(1):34-44. PMID: 22570145; X-5
2220. Kang S, O'Reilly M, Rojeski L, et al. Effects of tangible and social reinforcers on skill acquisition, stereotyped behavior, and task engagement in three children with autism spectrum disorders. Res Dev Disabil. 2013 Feb;34(2):739-44. PMID: 23220050; X-3
2221. Kang-Yi CD, Grinker RR, Mandell DS. Korean Culture and Autism Spectrum Disorders. Springer. 233 Spring Street, New York, NY 10013.; 2013. p. 503-20. X-4
2222. Kanne SM, Mazurek MO, Sikora D, et al. The Autism Impact Measure (AIM): Initial Development of a New Tool for Treatment Outcome Measurement. J Autism Dev Disord. 2013 Jun 8PMID: 23748386; X-5
2223. Karaaslan O, Diken IH, Mahoney G. A Randomized Control Study of Responsive Teaching with Young Turkish Children and Their Mothers. Topics in Early Childhood Special Education. 2013;33(1):18-27. X-3
2224. Kas MJ, Glennon JC, Buitelaar J, et al. Assessing behavioural and cognitive domains of autism spectrum disorders in rodents: current status and future perspectives. Psychopharmacology (Berl). 2013 Sep 19PMID: 24048469; X-5
2225. Kato K, Mikami K, Akama F, et al. Clinical features of suicide attempts in adults with autism spectrum disorders. Gen Hosp Psychiatry. 2013 Jan;35(1):50-3. PMID: 23141028; X-5
2226. Kats D, Payne L, Parlier M, et al. Prevalence of selected clinical problems in older adults with autism and intellectual disability. J Neurodev Disord. 2013;5(1):27. PMID: 24066979; X-5
2227. Kelly A, Barnes-Holmes D. Implicit attitudes towards children with autism versus normally developing children as predictors of professional burnout and psychopathology. Res Dev Disabil. 2013 Jan;34(1):17-28. PMID: 22940155; X-5
2228. Kent JM, Kushner S, Ning X, et al. Risperidone dosing in children and adolescents with autistic disorder: A double-blind, placebo-controlled study. Journal of Autism and Developmental Disorders. 2013;43(8):1773-83. X-5
2229. Khanna R, Jariwala K, Bentley JP. Health utility assessment using EQ-5D among caregivers of children with autism. Value Health. 2013 Jul-Aug;16(5):778-88. PMID: 23947971; X-5
2230. Khanna R, Jariwala K, West-Strum D. Use and cost of psychotropic drugs among recipients with autism in a state Medicaid fee-for-service programme. J Intellect Disabil Res. 2013 Feb;57(2):161-71. PMID: 22471524; X-5
2231. Khor AS, Melvin GA, Reid SC, et al. Coping, Daily Hassles and Behavior and Emotional Problems in Adolescents with High-Functioning Autism/Asperger's Disorder. J Autism Dev Disord. 2013 Aug 11PMID: 23933998; X-5
2232. Kim ES, Berkovits LD, Bernier EP, et al. Social Robots as Embedded Reinforcers of Social Behavior in Children with Autism. Journal of Autism and Developmental Disorders. 2013 May 2013;43(5):1038-49. X-5
2233. Kim KC, Lee DK, Go HS, et al. Pax6-Dependent Cortical Glutamatergic Neuronal Differentiation Regulates Autism-Like Behavior in Prenatally Valproic Acid-Exposed Rat Offspring. Mol Neurobiol. 2013 Sep 13PMID: 24030726; X-5
2234. Kim P, Park JH, Kwon KJ, et al. Effects of Korean red ginseng extracts on neural tube defects and impairment of social interaction induced by prenatal exposure to valproic acid. Food Chem Toxicol. 2013 Jan;51:288-96. PMID: 23104247; X-5
2235. King BH, Dukes K, Donnelly CL, et al. Baseline Factors Predicting Placebo Response to Treatment in Children and Adolescents With Autism Spectrum Disorders: A Multisite Randomized Clinical Trial. JAMA Pediatr. 2013 Sep 23PMID: 24061784; X-5
2236. Kingston C, Hibberd C, Ozsivadjian A. Parent experiences of a specialist intervention service for mental health difficulties in children with autistic spectrum disorder. Child and Adolescent Mental Health. 2013;18(2):109-15. X-5
2237. Kirby A, Sugden D, Purcell C. Diagnosing developmental coordination disorders. Arch Dis Child. 2013 Nov 19PMID: 24255567; X-5
2238. Klaiman C, Huffman L, Masaki L, et al. Tetrahydrobiopterin as a Treatment for Autism Spectrum Disorders: A Double-Blind, Placebo-Controlled Trial. Journal of Child and Adolescent Psychopharmacology. 2013;23(5):320-8. X-5

2239. Klintwall L, Eldevik S, Eikeseth S. Narrowing the gap: Effects of intervention on developmental trajectories in autism. Autism. 2013 Nov 8PMID: 24212258; X-5
2240. Kocsis B, Lee P, Deth R. Enhancement of gamma activity after selective activation of dopamine D4 receptors in freely moving rats and in a neurodevelopmental model of schizophrenia. Brain Struct Funct. 2013 Jul 10PMID: 23839116; X-5
2241. Koegel LK, Koegel RL, Ashbaugh K, et al. The importance of early identification and intervention for children with or at risk for autism spectrum disorders. Int J Speech Lang Pathol. 2013 Dec 11PMID: 24328352; X-5
2242. Koegel LK, Krasno AM, Taras H, et al. Is medication information for children with autism spectrum disorder monitored and coordinated across professionals? Findings from a teacher survey. School Mental Health. 2013;5(1):48-57. X-5
2243. Koegel LK, Park MN, Koegel RL. Using Self-Management to Improve the Reciprocal Social Conversation of Children with Autism Spectrum Disorder. J Autism Dev Disord. 2013 Oct 15PMID: 24127164; X-3
2244. Koegel RL, Bradshaw JL, Ashbaugh K, et al. Improving Question-Asking Initiations in Young Children with Autism Using Pivotal Response Treatment. J Autism Dev Disord. 2013 Sep 7PMID: 24014174; X-3
2245. Koehler-Platten K, Grow LL, Schulze KA, et al. Using a lag reinforcement schedule to increase phonemic variability in children with autism spectrum disorders. Anal Verbal Behav. 2013;29(1):71-83. PMID: 23814368; X-3
2246. Kohlstadt I, Wharton G. Clinician uptake of obesity-related drug information: a qualitative assessment using continuing medical education activities. Nutr J. 2013;12:44. PMID: 23575242; X-5
2247. Kondo N, Sakai M, Kuroda Y, et al. General condition of hikikomori (prolonged social withdrawal) in Japan: psychiatric diagnosis and outcome in mental health welfare centres. Int J Soc Psychiatry. 2013 Feb;59(1):79-86. PMID: 22094722; X-5
2248. Korkiakangas TK, Rae JP. Gearing up to a new activity: how teachers use object adjustments to manage the attention of children with autism. Augment Altern Commun. 2013 Mar;29(1):83-103. PMID: 23521354; X-5
2249. Kouijzer ME, van Schie HT, Gerrits BJ, et al. Is EEG-biofeedback an effective treatment in autism spectrum disorders? A randomized controlled trial. Appl Psychophysiol Biofeedback. 2013 Mar;38(1):17-28. PMID: 22903518; X-1, X-3
2250. Krstovska-Guerrero I, Jones EA. Joint attention in Autism: Teaching smiling coordinated with gaze to respond to joint attention bids. Research in Autism Spectrum Disorders. 2013;7(1):93-108. X-3
2251. Krueger DD, Brose N. Evidence for a common endocannabinoid-related pathomechanism in autism spectrum disorders. Neuron. 2013 May 8;78(3):408-10. PMID: 23664608; X-5
2252. Kuroda M, Kawakubo Y, Kuwabara H, et al. A cognitive-behavioral intervention for emotion regulation in adults with high-functioning autism spectrum disorders: study protocol for a randomized controlled trial. Trials. 2013;14:231. PMID: 23880333; X-5
2253. Lahav O, Apter A, Ratzon NZ. Psychological adjustment and levels of self esteem in children with visual-motor integration difficulties influences the results of a randomized intervention trial. Res Dev Disabil. 2013 Jan;34(1):56-64. PMID: 22940159; X-5
2254. Lahiri U, Bekele E, Dohrmann E, et al. Design of a virtual reality based adaptive response technology for children with autism. IEEE Trans Neural Syst Rehabil Eng. 2013 Jan;21(1):55-64. PMID: 23033333; X-5
2255. Lai MC, Lombardo MV, Baron-Cohen S. Autism. Lancet. 2013 Sep 25PMID: 24074734; X-5
2256. Landsberger SA, Diaz DR, Spring NZ, et al. Psychiatric Diagnoses and Psychosocial Needs of Outpatient Deaf Children and Adolescents. Child Psychiatry Hum Dev. 2013 Mar 16PMID: 23504290; X-5
2257. Langdon PE, Murphy GH, Clare IC, et al. An evaluation of the EQUIP treatment programme with men who have intellectual or other developmental disabilities. J Appl Res Intellect Disabil. 2013 Mar;26(2):167-80. PMID: 23281218; X-5
2258. Langdon PE, Murphy GH, Wilson E, et al. Asperger syndrome and anxiety disorders (PAsSA) treatment trial: a study protocol of a pilot, multicentre, single-blind, randomised crossover trial of group cognitive behavioural therapy. BMJ Open. 2013;3(7)PMID: 23901031; X-5
2259. Lange N, McDougle C. Help for the child with autism. Sci Am. 2013 Oct;309(4):72-7. PMID: 24137859; X-1, X-2, X-3, X-4
2260. Lanovaz MJ, Rapp JT, Ferguson S. Assessment and treatment of vocal stereotypy associated with television: A pilot study. Journal of Applied Behavior Analysis. 2013;46(2):544-8. X-3, X-5
2261. Lanz TA, Guilmette E, Gosink MM, et al. Transcriptomic analysis of genetically defined autism candidate genes reveals common mechanisms of action. Mol Autism. 2013 Nov 15;4(1):45. PMID: 24238429; X-1, X-3, X-4
2262. Latta A, Rampton T, Rosemann J, et al. Snapshots reflecting the lives of siblings of children with autism spectrum disorders. Child Care Health Dev. 2013 Aug 19PMID: 23952538; X-5

2263. Leaf JB, Tsuji KH, Lentell AE, et al. A comparison of discrete trial teaching implemented in a one-to-one instructional format and in a group instructional format. Behavioral Interventions. 2013;28(1):82-106. X-3
2264. Lecavalier L, Wood JJ, Halladay AK, et al. Measuring Anxiety as a Treatment Endpoint in Youth with Autism Spectrum Disorder. J Autism Dev Disord. 2013 Oct 26PMID: 24158679; X-4
2265. Lee A, Lang R, Davenport K, et al. Comparison of therapist implemented and iPad-assisted interventions for children with autism. Dev Neurorehabil. 2013 Oct 2PMID: 24088050; X-3
2266. Lee DR, McKeith I, Mosimann U, et al. Examining carer stress in dementia: the role of subtype diagnosis and neuropsychiatric symptoms. Int J Geriatr Psychiatry. 2013 Feb;28(2):135-41. PMID: 22422615; X-5
2267. Lehti V, Brown AS, Gissler M, et al. Autism spectrum disorders in IVF children: a national case-control study in Finland. Hum Reprod. 2013 Mar;28(3):812-8. PMID: 23293220; X-5
2268. Lemaire M, Thomazeau B, Bonnet-Brilhault F. Gender Identity Disorder and Autism Spectrum Disorder in a 23-Year-Old Female. Arch Sex Behav. 2013 Jul 9PMID: 23835847; X-5
2269. Lipton J, Sahin M. Fragile X syndrome therapeutics: translation, meet translational medicine. Neuron. 2013 Jan 23;77(2):212-3. PMID: 23352156; X-5
2270. Liu X, Lack D, Rakowski JT, et al. Fast Monte Carlo simulation for total body irradiation using a (60)Co teletherapy unit. J Appl Clin Med Phys. 2013;14(3):4214. PMID: 23652253; X-5
2271. Liyanage VR, Zachariah RM, Rastegar M. Decitabine alters the expression of Mecp2 isoforms via dynamic DNA methylation at the Mecp2 regulatory elements in neural stem cells. Mol Autism. 2013 Nov 15;4(1):46. PMID: 24238559; X-5
2272. Lloyd-Fox S, Blasi A, Elwell CE, et al. Reduced neural sensitivity to social stimuli in infants at risk for autism. Proc Biol Sci. 2013 May 7;280(1758):20123026. PMID: 23486434; X-5
2273. Lo-Castro A, Curatolo P. Epilepsy associated with autism and attention deficit hyperactivity disorder: Is there a genetic link? Brain Dev. 2013 May 29PMID: 23726375; X-5
2274. Lock RH, Bradley L, Hendricks B, et al. Evaluating the success of a parent-professional autism network: Implications for family counselors. The Family Journal. 2013;21(3):288-96. X-5
2275. Locke J, Rotheram-Fuller E, Xie M, et al. Correlation of cognitive and social outcomes among children with autism spectrum disorder in a randomized trial of behavioral intervention. Autism. 2013 Oct 8PMID: 24104511; X-5
2276. Lofkvist U, Almkvist O, Lyxell B, et al. Lexical and semantic ability in groups of children with cochlear implants, language impairment and autism spectrum disorder. Int J Pediatr Otorhinolaryngol. 2013 Nov 25PMID: 24332667; X-4
2277. Lopata C, Toomey JA, Fox JD, et al. Prevalence and Predictors of Psychotropic Use in Children with High-Functioning ASDs. Autism Res Treat. 2013;2013:384527. PMID: 23762550; X-1, X-4
2278. Lopes AM, Aston KI, Thompson E, et al. Human spermatogenic failure purges deleterious mutation load from the autosomes and both sex chromosomes, including the gene DMRT1. PLoS Genet. 2013 Mar;9(3):e1003349. PMID: 23555275; X-5
2279. Lopez-Pison J, Garcia-Jimenez MC, Monge-Galindo L, et al. Our experience with the aetiological diagnosis of global developmental delay and intellectual disability: 2006-2010. Neurologia. 2013 Dec 10PMID: 24332781; X-5
2280. Lorenzo G, Pomares J, Lledo A. Inclusion of Immersive Virtual Learning Environments and Visual Control Systems to Support the Learning of Students with Asperger Syndrome. Computers & Education. 2013 March 2013;62(3):88-101. X-5
2281. Louw K-A, Bentley J, Sorsdahl K, et al. Prevalence and patterns of medication use in children and adolescents with autism spectrum disorders in the Western Cape, South Africa. Journal of Child and Adolescent Mental Health. 2013;25(1):69-79. X-1, X-4
2282. Lundqvist L-O. Prevalence and Risk Markers of Behavior Problems among Adults with Intellectual Disabilities: A Total Population Study in Orebro County, Sweden. Research in Developmental Disabilities: A Multidisciplinary Journal. 2013 April 2013;34(4):1346-56. X-5
2283. Lyall K, Munger KL, O'Reilly EJ, et al. Maternal dietary fat intake in association with autism spectrum disorders. Am J Epidemiol. 2013 Jul 15;178(2):209-20. PMID: 23813699; X-5
2284. Ma WJ, Hashii M, Munesue T, et al. Non-synonymous single-nucleotide variations of the human oxytocin receptor gene and autism spectrum disorders: a case-control study in a Japanese population and functional analysis. Mol Autism. 2013;4(1):22. PMID: 23815867; X-5
2285. MacDonald M, Lord C, Ulrich D. The relationship of motor skills and adaptive behavior skills in young children with autism spectrum disorders. Research in Autism Spectrum Disorders. 2013;7(11):1383-90. X-5

2286. Maenner MJ, Smith LE, Hong J, et al. Evaluation of an activities of daily living scale for adolescents and adults with developmental disabilities. Disabil Health J. 2013 Jan;6(1):8-17. PMID: 23260606; X-5
2287. Magaña S, Lopez K, Aguinaga A, et al. Access to diagnosis and treatment services among Latino children with autism spectrum disorders. Intellectual and Developmental Disabilities. 2013;51(3):141-53. X-5
2288. Majewska MD, Hill M, Urbanowicz E, et al. Marked elevation of adrenal steroids, especially androgens, in saliva of prepubertal autistic children. Eur Child Adolesc Psychiatry. 2013 Sep 17PMID: 24043498; X-5
2289. Mandell DS, Stahmer AC, Shin S, et al. The role of treatment fidelity on outcomes during a randomized field trial of an autism intervention. Autism. 2013 May;17(3):281-95. PMID: 23592849; X-5
2290. Manoach DS, Agam Y. Neural markers of errors as endophenotypes in neuropsychiatric disorders. Front Hum Neurosci. 2013;7:350. PMID: 23882201; X-5
2291. Manseau M, Case BG. Racial-Ethnic Disparities in Outpatient Mental Health Visits to U.S. Physicians, 1993-2008. Psychiatr Serv. 2013 Oct 15PMID: 24129773; X-5
2292. Mari-Bauset S, Zazpe I, Mari-Sanchis A, et al. Food Selectivity in Autism Spectrum Disorders: A Systematic Review. J Child Neurol. 2013 Oct 4PMID: 24097852; X-5
2293. Marrus N, Veenstra-Vanderweele J, Hellings JA, et al. Training of child and adolescent psychiatry fellows in autism and intellectual disability. Autism. 2013 Oct 10PMID: 24113341; X-5
2294. Marshall J, Hill RJ, Dodrill P. A survey of practice for clinicians working with children with autism spectrum disorders and feeding difficulties. Int J Speech Lang Pathol. 2013 Jun;15(3):279-85. PMID: 23577744; X-5
2295. Marshall J, Hill RJ, Ziviani J, et al. Features of feeding difficulty in children with Autism Spectrum Disorder. Int J Speech Lang Pathol. 2013 Sep 3PMID: 24001171; X-1, X-2
2296. Martel-Laferriere V, Laflamme P, Ghannoum M, et al. Treatment of prosthetic joint infections: validation of a surgical algorithm and proposal of a simplified alternative. J Arthroplasty. 2013 Mar;28(3):395-400. PMID: 23151368; X-5
2297. Marti LF. Dietary Interventions in Children with Autism Spectrum Disorders- An Updated Review of The Research Evidence. Curr Clin Pharmacol. 2013 Sep 20PMID: 24050740; X-6
2298. Maruta H. Herbal Therapeutics that Block the Oncogenic Kinase PAK1: A Practical Approach towards PAK1-dependent Diseases and Longevity. Phytother Res. 2013 Aug 14PMID: 23943274; X-5
2299. Mascaro JS, Rilling JK, Tenzin Negi L, et al. Compassion meditation enhances empathic accuracy and related neural activity. Soc Cogn Affect Neurosci. 2013 Jan;8(1):48-55. PMID: 22956676; X-1, X-5
2300. Mathersul D, McDonald S, Rushby JA. Psychophysiological correlates of social judgement in high-functioning adults with autism spectrum disorder. Int J Psychophysiol. 2013 Jan;87(1):88-94. PMID: 23183316; X-5
2301. Matson JL, Adams HL, Williams LW, et al. Why Are There so Many Unsubstantiated Treatments in Autism? Research in Autism Spectrum Disorders. 2013 March 2013;7(3):466-74. X-5
2302. Matson JL, Konst MJ. What Is the Evidence for Long Term Effects of Early Autism Interventions? Research in Autism Spectrum Disorders. 2013 March 2013;7(3):475-9. X-1, X-2, X-3, X-4
2303. Matson JL, Kozlowski AM, Fitzgerald ME, et al. True versus False Positives and Negatives on the "Modified Checklist for Autism in Toddlers". Research in Autism Spectrum Disorders. 2013 January 2013;7(1):17-22. X-5
2304. Mavranezouli I, Megnin-Viggars O, Cheema N, et al. The cost-effectiveness of supported employment for adults with autism in the United Kingdom. Autism. 2013 Oct 14PMID: 24126866; X-5
2305. May RJ, Hawkins E, Dymond S. Brief Report: Effects of Tact Training on Emergent Intraverbal Vocal Responses in Adolescents with Autism. Journal of Autism and Developmental Disorders. 2013 April 2013;43(4):996-1004. X-5
2306. Mayr R, Burger M. Value of fluorescence cystoscopy in high risk non-muscle invasive bladder cancer. Curr Urol Rep. 2013 Apr;14(2):90-3. PMID: 23341375; X-5
2307. Mazefsky CA, Schreiber DR, Olino TM, et al. The association between emotional and behavioral problems and gastrointestinal symptoms among children with high-functioning autism. Autism. 2013 Oct 8PMID: 24104507; X-5
2308. Mazurek MO, Engelhardt CR. Video game use in boys with autism spectrum disorder, ADHD, or typical development. Pediatrics. 2013 Aug;132(2):260-6. PMID: 23897915; X-5
2309. Mbadiwe T, Millis RM. Epigenetics and Autism. Autism Res Treat. 2013;2013:826156. PMID: 24151554; X-2, X-5
2310. McCartney M. MMR, measles, and the South Wales Evening Post. BMJ. 2013;346:f2598. PMID: 23610382; X-5
2311. McCleery JP, Elliott NA, Sampanis DS, et al. Motor development and motor resonance difficulties in autism: relevance to early intervention for language and communication skills. Front Integr Neurosci. 2013;7:30. PMID: 23630476; X-5

2312. McConachie H, McLaughlin E, Grahame V, et al. Group therapy for anxiety in children with autism spectrum disorder. Autism. 2013 Oct 7PMID: 24101715; X-1
2313. McCurdy EE, Cole CL. Use of a Peer Support Intervention for Promoting Academic Engagement of Students with Autism in General Education Settings. J Autism Dev Disord. 2013 Oct 22PMID: 24146130; X-3
2314. McGinnis AA, Blakely EQ, Harvey AC, et al. The behavioral effects of a procedure used by pediatric occupational therapists. Behavioral Interventions. 2013;28(1):48-57. X-3
2315. McGregor KK, Rost G, Arenas R, et al. Children with ASD can use gaze in support of word recognition and learning. J Child Psychol Psychiatry. 2013 Jul;54(7):745-53. PMID: 23574387; X-5
2316. McGuinness TM, Johnson K. DSM-5 changes in the diagnosis of autism spectrum disorder. J Psychosoc Nurs Ment Health Serv. 2013 Apr;51(4):17-9. PMID: 23445685; X-5
2317. McGuinty E, Armstrong D, Carriere AM. A Clinical Treatment Intervention for Dysphoria: Externalizing Metaphors Therapy. Clin Psychol Psychother. 2013 May 20PMID: 23686568; X-5
2318. McMahon CM, Lerner MD, Britton N. Group-based social skills interventions for adolescents with higher-functioning autism spectrum disorder: a review and looking to the future. Adolesc Health Med Ther. 2013 Jan 22;2013(4):23-8. PMID: 23956616; X-5
2319. Memari AH, Ghaheri B, Ziaee V, et al. Physical activity in children and adolescents with autism assessed by triaxial accelerometry. Pediatr Obes. 2013 Apr;8(2):150-8. PMID: 23042790; X-5
2320. Memari AH, Shayestehfar M, Mirfazeli FS, et al. Cross-cultural adaptation, reliability, and validity of the autism treatment evaluation checklist in persian. Iran J Pediatr. 2013 Jun;23(3):269-75. PMID: 23795248; X-5
2321. Messinger D, Young GS, Ozonoff S, et al. Beyond Autism: A Baby Siblings Research Consortium Study of High-Risk Children at Three Years of Age. Journal of the American Academy of Child & Adolescent Psychiatry. 2013 March 2013;52(3):300-8. X-5
2322. Miltenberger CA, Charlop MH. Increasing the Athletic Group Play of Children with Autism. J Autism Dev Disord. 2013 May 23PMID: 23700189; X-3
2323. Minjarez MB, Mercier EM, Williams SE, et al. Impact of pivotal response training group therapy on stress and empowerment in parents of children with autism. Journal of Positive Behavior Interventions. 2013;15(2):71-8. X-5
2324. Mire SS, Nowell KP, Kubiszyn T, et al. Psychotropic medication use among children with autism spectrum disorders within the Simons Simplex Collection: Are core features of autism spectrum disorder related? Autism. 2013 Sep 26PMID: 24031086; X-1, X-4
2325. Miyajima T, Kumada T, Saito K, et al. Autism in siblings with autosomal dominant nocturnal frontal lobe epilepsy. Brain Dev. 2013 Feb;35(2):155-7. PMID: 22883468; X-5
2326. Molteni M, Cattaneo D, Nobile M, et al. Potential Benefits and Limits of Psychopharmacological Therapies in Pervasive Developmental Disorders. Curr Clin Pharmacol. 2013 Sep 20PMID: 24050744; X-5
2327. Molteni P, Guldberg K, Logan N. Autism and multidisciplinary teamwork through the SCERTS model. British Journal of Special Education. 2013;40(3):137-45. X-1, X-3, X-4
2328. Monahan M, Classen S, Helsel PV. Pre-driving evaluation of a teen with attention deficit hyperactivity disorder and autism spectrum disorder. Can J Occup Ther. 2013 Feb;80(1):35-41. PMID: 23550495; X-5
2329. Moore DW, Venkatesh S, Anderson A, et al. TOBY play-pad application to teach children with ASD - A pilot trial. Dev Neurorehabil. 2013 Jul 19PMID: 23869435; X-1, X-4
2330. Moran MF, Foley JT, Parker ME, et al. Two-legged hopping in autism spectrum disorders. Front Integr Neurosci. 2013;7:14. PMID: 23532337; X-5
2331. Moss J, Oliver C, Nelson L, et al. Delineating the profile of autism spectrum disorder characteristics in Cornelia de Lange and Fragile X syndromes. Am J Intellect Dev Disabil. 2013 Jan;118(1):55-73. PMID: 23301903; X-5
2332. Moyal WN, Lord C, Walkup JT. Quality of Life in Children and Adolescents with Autism Spectrum Disorders: What Is Known About the Effects of Pharmacotherapy? Paediatr Drugs. 2013 Oct 24PMID: 24155138; X-1, X-2, X-3, X-4
2333. Mucchetti CA. Adapted shared reading at school for minimally verbal students with Autism. Autism. 2013 May 2013;17(3):358-72. X-3, X-4
2334. Mukherjee S, Rupani K, Dave M, et al. Evaluation of Effectiveness of Integrated Intervention in Autistic Children. Indian J Pediatr. 2013 Sep 21PMID: 24057967; X-5
2335. Mulligan CK, Trauner DA. Incidence and Behavioral Correlates of Epileptiform Abnormalities in Autism Spectrum Disorders. J Autism Dev Disord. 2013 Jul 20PMID: 23872941; X-5
2336. Murray KE, Nyp SS, Wassom MC. Journal article reviews. Journal of Developmental and Behavioral Pediatrics. 2013;34(2):141-5. X-5

2337. Murray ML, Hsia Y, Glaser K, et al. Pharmacological treatments prescribed to people with autism spectrum disorder (ASD) in primary health care. Psychopharmacology (Berl). 2013 May 17PMID: 23681164; X-1, X-3, X-4
2338. Myers CL, Gross AD, McReynolds BM. Broadband Behavior Rating Scales as Screeners for Autism? J Autism Dev Disord. 2013 Nov 28PMID: 24287879; X-5
2339. Naber FB, Poslawsky IE, van Ijzendoorn MH, et al. Brief Report: Oxytocin Enhances Paternal Sensitivity to a Child with Autism--A Double-Blind Within-Subject Experiment with Intranasally Administered Oxytocin. Journal of Autism and Developmental Disorders. 2013;43(1):224-9. X-5
2340. Narayanan S, Georgiou PG. Behavioral Signal Processing: Deriving Human Behavioral Informatics From Speech and Language: Computational techniques are presented to analyze and model expressed and perceived human behavior-variedly characterized as typical, atypical, distressed, and disordered-from speech and language cues and their applications in health, commerce, education, and beyond. Proc IEEE Inst Electr Electron Eng. 2013 Feb 7;101(5):1203-33. PMID: 24039277; X-5
2341. Narcisa V, Discenza M, Vaccari E, et al. Parental interest in a genetic risk assessment test for autism spectrum disorders. Clin Pediatr (Phila). 2013 Feb;52(2):139-46. PMID: 23193169; X-5
2342. Narzisi A, Colombi C, Balottin U, et al. Non- Pharmacological Treatments in Autism Spectrum Disorders: An Overview on Early Interventions for Pre-schoolers. Curr Clin Pharmacol. 2013 Sep 20PMID: 24050743; X-2
2343. Neal D, Matson JL, Belva BC. An examination of the reliability of a new observation measure for Autism spectrum disorders: The autism spectrum disorder observation for children. Research in Autism Spectrum Disorders. 2013;7(1):29-34. X-5
2344. Neece CL. Mindfulness-Based Stress Reduction for Parents of Young Children with Developmental Delays: Implications for Parental Mental Health and Child Behavior Problems. J Appl Res Intellect Disabil. 2013 Jul 1PMID: 23813562; X-1, X-4
2345. Neuhaus E, Bernier R, Beauchaine TP. Brief Report: Social Skills, Internalizing and Externalizing Symptoms, and Respiratory Sinus Arrhythmia in Autism. J Autism Dev Disord. 2013 Aug 28PMID: 23982488; X-5
2346. Neumeyer AM, Gates A, Ferrone C, et al. Bone density in peripubertal boys with autism spectrum disorders. Journal of Autism and Developmental Disorders. 2013;43(7):1623-9. X-5
2347. Norbury CF. Practitioner Review: Social (pragmatic) communication disorder conceptualization, evidence and clinical implications. J Child Psychol Psychiatry. 2013 Oct 9PMID: 24117874; X-5
2348. Nosik MR, Williams WL, Garrido N, et al. Comparison of computer based instruction to behavior skills training for teaching staff implementation of discrete-trial instruction with an adult with autism. Res Dev Disabil. 2013 Jan;34(1):461-8. PMID: 23041660; X-5
2349. Nousen EK, Franco JG, Sullivan EL. Unraveling the Mechanisms Responsible for the Comorbidity between Metabolic Syndrome and Mental Health Disorders. Neuroendocrinology. 2013 Sep 21PMID: 24080959; X-5
2350. Occelli V, Esposito G, Venuti P, et al. The Takete-Maluma phenomenon in autism spectrum disorders. Perception. 2013;42(2):233-41. PMID: 23700961; X-5
2351. Ogletree BT, Morrow-Odom KL, Westling D. Understanding the brain-behaviour relationship in persons with ASD: Implications for PECS as a treatment choice. Dev Neurorehabil. 2013 Sep 24PMID: 24063565; X-2, X-5
2352. O'Haire ME. Animal-Assisted Intervention for Autism Spectrum Disorder: A Systematic Literature Review. Journal of Autism and Developmental Disorders. 2013 Jul 2013;43(7):1606-22. X-5
2353. O'Haire ME, McKenzie SJ, McCune S, et al. Effects of Classroom Animal-Assisted Activities on Social Functioning in Children with Autism Spectrum Disorder. J Altern Complement Med. 2013 Oct 24PMID: 24156772; X-5
2354. O'Hearn K, Franconeri S, Wright C, et al. The development of individuation in autism. J Exp Psychol Hum Percept Perform. 2013 Apr;39(2):494-509. PMID: 22963232; X-5
2355. Omori M, Yamamoto J. Stimulus pairing training for Kanji reading skills in students with developmental disabilities. Res Dev Disabil. 2013 Apr;34(4):1109-18. PMID: 23357673; X-3, X-5
2356. Onore CE, Careaga M, Babineau BA, et al. Inflammatory macrophage phenotype in BTBR T+tf/J mice. Front Neurosci. 2013;7:158. PMID: 24062633; X-5
2357. Oranje B, Lahuis B, van Engeland H, et al. Sensory and sensorimotor gating in children with multiple complex developmental disorders (MCDD) and autism. Psychiatry Res. 2013 Apr 30;206(2-3):287-92. PMID: 23164481; X-5
2358. Orellana LM, Martinez-Sanchis S, Silvestre FJ. Training Adults and Children with an Autism Spectrum Disorder to be Compliant with a Clinical Dental Assessment Using a TEACCH-Based Approach. J Autism Dev Disord. 2013 Sep 4PMID: 24002415; X-5

2359. Ozdemir S, Tuncer U, Tarkan O, et al. Factors contributing to limited or non-use in the cochlear implant systems in children: 11 years experience. Int J Pediatr Otorhinolaryngol. 2013 Mar;77(3):407-9. PMID: 23280278; X-5
2360. Pahnke J, Lundgren T, Hursti T, et al. Outcomes of an acceptance and commitment therapy-based skills training group for students with high-functioning autism spectrum disorder: A quasi-experimental pilot study. Autism. 2013 Oct 18PMID: 24142796; X-5
2361. Panerai S, Tasca D, Lanuzza B, et al. Effects of repetitive transcranial magnetic stimulation in performing eye-hand integration tasks: Four preliminary studies with children showing low-functioning autism. Autism. 2013 Oct 10PMID: 24113340; X-2, X-3, X-5
2362. Pardo CA, Buckley A, Thurm A, et al. A pilot open-label trial of minocycline in patients with autism and regressive features. J Neurodev Disord. 2013 Apr 8;5(1):9. PMID: 23566357; X-5
2363. Parellada M, Boada L, Moreno C, et al. Specialty care programme for autism spectrum disorders in an urban population: A case-management model for health care delivery in an ASD population. European Psychiatry. 2013;28(2):102-9. X-5
2364. Parenteau RE, Luiselli JK, Keeley M. Direct and collateral effects of staff-worn protective equipment on injury prevention from child aggression. Dev Neurorehabil. 2013;16(1):73-7. PMID: 23249373; X-5
2365. Park DH, Lim S, Park ES, et al. A nine-month-old boy with isodicentric chromosome 15: a case report. Ann Rehabil Med. 2013 Apr;37(2):291-4. PMID: 23705128; X-5
2366. Park S, Park M-H, Kim HJ, et al. Anxiety and Depression Symptoms in Children with Asperger Syndrome Compared with Attention-Deficit/Hyperactivity Disorder and Depressive Disorder. Journal of Child and Family Studies. 2013;22(4):559-68. X-5
2367. Pascoe JM. Foreword. Curr Probl Pediatr Adolesc Health Care. 2013 Jan;43(1):1. PMID: 23332396; X-5
2368. Pasquali M, Schwarz E, Jensen M, et al. Feasibility of newborn screening for guanidinoacetate methyltransferase (GAMT) deficiency. J Inherit Metab Dis. 2013 Nov 26PMID: 24276113; X-5
2369. Pasterski V, Gilligan L, Curtis R. Traits of Autism Spectrum Disorders in Adults with Gender Dysphoria. Arch Sex Behav. 2013 Jul 18PMID: 23864402; X-5
2370. Patten E, Baranek GT, Watson LR, et al. Child and family characteristics influencing intervention choices in autism spectrum disorders. Focus on Autism and Other Developmental Disabilities. 2013;28(3):138-46. X-5
2371. Paul R, Campbell D, Gilbert K, et al. Comparing Spoken Language Treatments for Minimally Verbal Preschoolers with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders. 2013;43(2):418-31. X-5
2372. Pavone P, Striano P, Falsaperla R, et al. Infantile spasms syndrome, West syndrome and related phenotypes: What we know in 2013. Brain Dev. 2013 Nov 19PMID: 24268986; X-5
2373. Pearson DA, Santos CW, Aman MG, et al. Effects of extended release methylphenidate treatment on ratings of attention-deficit/hyperactivity disorder (ADHD) and associated behavior in children with autism spectrum disorders and ADHD symptoms. Journal of Child and Adolescent Psychopharmacology. 2013;23(5):337-51. X-5
2374. Pedersen L, Parlar S, Kvist K, et al. Data mining the ScanBrit study of a gluten- and casein-free dietary intervention for children with autism spectrum disorders: Behavioural and psychometric measures of dietary response. Nutr Neurosci. 2013 Sep 7PMID: 24075141; X-5
2375. Penjweini R, Loew HG, Eisenbauer M, et al. Modifying excitation light dose of novel photosensitizer PVP-Hypericin for photodynamic diagnosis and therapy. J Photochem Photobiol B. 2013 Mar 5;120:120-9. PMID: 23375215; X-5
2376. Perou R, Bitsko RH, Blumberg SJ, et al. Mental health surveillance among children--United States, 2005-2011. MMWR Surveill Summ. 2013 May 17;62 Suppl 2:1-35. PMID: 23677130; X-5
2377. Persicke A, Tarbox J, Ranick J, et al. Teaching children with autism to detect and respond to sarcasm. Research in Autism Spectrum Disorders. 2013;7(1):193-8. X-3
2378. Perumal N, Balan N, Stanfield A. Psychopharmacology in children with intellectual disability and autism—A cross-sectional analysis (2010). International Journal of Developmental Disabilities. 2013;59(1):11-9. X-5
2379. Peters B, Williams KC, Gorrindo P, et al. Rigid-Compulsive Behaviors are Associated with Mixed Bowel Symptoms in Autism Spectrum Disorder. J Autism Dev Disord. 2013 Nov 29PMID: 24293040; X-5
2380. Peters LC, Thompson RH. Some indirect effects of positive practice overcorrection. Journal of Applied Behavior Analysis. 2013;46(3):613-25. X-5
2381. Pettygrove S, Pinborough-Zimmerman J, John Meaney F, et al. Predictors of ascertainment of autism spectrum disorders across nine US communities. Journal of Autism and Developmental Disorders. 2013;43(8):1867-79. X-5

2382. Plumb AM, Plexico LW. Autism spectrum disorders: experience, training, and confidence levels of school-based speech-language pathologists. Lang Speech Hear Serv Sch. 2013 Jan;44(1):89-104. PMID: 23087159; X-5
2383. Politte LC, McDougle CJ. Atypical antipsychotics in the treatment of children and adolescents with pervasive developmental disorders. Psychopharmacology (Berl). 2013 Apr 4PMID: 23552907; X-2
2384. Polo-Kantola P, Lampi KM, Hinkka-Yli-Salomaki S, et al. Obstetric Risk Factors and Autism Spectrum Disorders in Finland. J Pediatr. 2013 Oct 30PMID: 24183209; X-5
2385. Poon KK, Koh L, Magiati I. Parental Perspectives on the Importance and Likelihood of Adult Outcomes for Children with Autism Spectrum Disorders, Intellectual Disabilities or Multiple Disabilities. Research in Autism Spectrum Disorders. 2013 February 2013;7(2):382-90. X-5
2386. Poot M. Towards identification of individual etiologies by resolving genomic and biological conundrums in patients with autism spectrum disorders. Mol Syndromol. 2013 Jun;4(5):213-26. PMID: 23885228; X-5
2387. Pop AS, Gomez-Mancilla B, Neri G, et al. Fragile X syndrome: a preclinical review on metabotropic glutamate receptor 5 (mGluR5) antagonists and drug development. Psychopharmacology (Berl). 2013 Nov 15PMID: 24232444; X-5
2388. Post SG, Pomeroy J, Keirns CC, et al. Brief report: Stony Brook Guidelines on the ethics of the care of people with autism and their families. Journal of Autism and Developmental Disorders. 2013;43(6):1473-6. X-5
2389. Potter JN, Hanley GP, Augustine M, et al. Treating stereotypy in adolescents diagnosed with autism by refining the tactic of "using stereotypy as reinforcement". Journal of Applied Behavior Analysis. 2013;46(2):407-23. X-5
2390. Poustka L, Brandeis D, Hohmann S, et al. Neurobiologically based interventions for autism spectrum disorders-rationale and new directions. Restor Neurol Neurosci. 2013 Apr 17PMID: 23603445; X-1, X-2, X-3, X-4
2391. Pugliese CE, White SW. Brief Report: Problem Solving Therapy in College Students with Autism Spectrum Disorders: Feasibility and Preliminary Efficacy. J Autism Dev Disord. 2013 Aug 21PMID: 23963592; X-5
2392. Qiao J, Gao J, Shu Q, et al. Long-lasting sensitization induced by repeated risperidone treatment in adolescent Sprague-Dawley rats: a possible D receptor mediated phenomenon? Psychopharmacology (Berl). 2013 Dec 21PMID: 24363078; X-5
2393. Rada RE. Treatment needs and adverse events related to dental treatment under general anesthesia for Individuals with autism. Intellectual and Developmental Disabilities. 2013;51(4):246-52. X-5
2394. Radonovich KJ, Fournier KA, Hass CJ. Relationship between postural control and restricted, repetitive behaviors in autism spectrum disorders. Front Integr Neurosci. 2013;7:28. PMID: 23675326; X-5
2395. Radulescu E, Minati L, Ganeshan B, et al. Abnormalities in fronto-striatal connectivity within language networks relate to differences in grey-matter heterogeneity in Asperger syndrome. Neuroimage Clin. 2013;2:716-26. PMID: 24179823; X-5
2396. Rafferty A, Martin J, Strachan D, et al. Cochlear implantation in children with complex needs - outcomes. Cochlear Implants Int. 2013 Mar;14(2):61-6. PMID: 22333941; X-3, X-4
2397. Rai D, Lee BK, Dalman C, et al. Parental depression, maternal antidepressant use during pregnancy, and risk of autism spectrum disorders: population based case-control study. BMJ. 2013;346:f2059. PMID: 23604083; X-5
2398. Ramaekers VT, Quadros EV, Sequeira JM. Role of folate receptor autoantibodies in infantile autism. Molecular Psychiatry. 2013;18(3):270-1. X-5
2399. Ramirez PL, Barnhill K, Gutierrez A, et al. Improvements in Behavioral Symptoms following Antibiotic Therapy in a 14-Year-Old Male with Autism. Case Rep Psychiatry. 2013;2013:239034. PMID: 23853732; X-5
2400. Ramsey JM, Guest PC, Broek JA, et al. Identification of an age-dependent biomarker signature in children and adolescents with autism spectrum disorders. Mol Autism. 2013;4(1):27. PMID: 23915542; X-5
2401. Ranick J, Persicke A, Tarbox J, et al. Teaching children with autism to detect and respond to deceptive statements. Research in Autism Spectrum Disorders. 2013;7(4):503-8. X-3
2402. Ravindran N, Myers BJ. Beliefs and Practices Regarding Autism in Indian Families Now Settled Abroad: An Internet Survey. Focus on Autism and Other Developmental Disabilities. 2013 March 2013;28(1):44-53. X-5
2403. Raz R, Lerner-Geva L, Leon O, et al. A survey of out-of-pocket expenditures for children with autism spectrum disorder in Israel. Journal of Autism and Developmental Disorders. 2013;43(10):2295-302. X-5
2404. Redhair EI, McCoy KM, Zucker SH, et al. Identification of printed nonsense words for an individual with autism: A comparison of constant time delay and stimulus fading. Education and Training in Autism and Developmental Disabilities. 2013;48(3):351-62. X-3
2405. Reeves GM, Keeton C, Correll CU, et al. Improving metabolic parameters of antipsychotic child treatment (IMPACT) study: rationale, design, and methods. Child Adolesc Psychiatry Ment Health. 2013;7(1):31. PMID: 23947389; X-1, X-2, X-3, X-4

2406. Reichow B, Volkmar FR, Bloch MH. Systematic Review and Meta-analysis of Pharmacological Treatment of the Symptoms of Attention-Deficit/Hyperactivity Disorder in Children with Pervasive Developmental Disorders. J Autism Dev Disord. 2013 Mar 7PMID: 23468071; X-5
2407. Renzi C, Schiavi S, Carbon CC, et al. Processing of featural and configural aspects of faces is lateralized in dorsolateral prefrontal cortex: a TMS study. Neuroimage. 2013 Jul 1;74:45-51. PMID: 23435211; X-5
2408. Reser JE. Solitary Mammals Provide an Animal Model for Autism Spectrum Disorders. J Comp Psychol. 2013 Nov 4PMID: 24188618; X-5
2409. Reszka SS, Boyd BA, McBee M, et al. Brief Report: Concurrent Validity of Autism Symptom Severity Measures. J Autism Dev Disord. 2013 Jun 27PMID: 23807205; X-5
2410. Rieger A, McGrail JP. Coping humor and family functioning in parents of children with disabilities. Rehabil Psychol. 2013 Feb;58(1):89-97. PMID: 23438005; X-5
2411. Rieske RD, Matson JL, Davis TE, 3rd, et al. Examination and validation of a measure of anxiety specific to children with autism spectrum disorders. Dev Neurorehabil. 2013;16(1):9-16. PMID: 23030738; X-5
2412. Rispoli M, Lang R, Neely L, et al. A Comparison of within- and across-Activity Choices for Reducing Challenging Behavior in Children with Autism Spectrum Disorders. Journal of Behavioral Education. 2013;22(1):66-83. X-3
2413. Robertson RE, Wehby JH, King SM. Increased parent reinforcement of spontaneous requests in children with autism spectrum disorder: effects on problem behavior. Res Dev Disabil. 2013 Mar;34(3):1069-82. PMID: 23299185; X-3, X-5
2414. Robins DL, Casagrande K, Barton M, et al. Validation of the Modified Checklist for Autism in Toddlers, Revised With Follow-up (M-CHAT-R/F). Pediatrics. 2013 Dec 23PMID: 24366990; X-5
2415. Rossignol DA. My experience learning about autism. Glob Adv Health Med. 2013 Nov;2(6):74-7. PMID: 24349885; X-5
2416. Rossignol DA, Frye RE. Melatonin in Autism Spectrum Disorders. Curr Clin Pharmacol. 2013 Sep 20PMID: 24050742; X-6
2417. Roux G, Sofronoff K, Sanders M. A randomized controlled trial of group Stepping Stones Triple P: A mixed-disability trial. Family Process. 2013;52(3):411-24. X-3, X-4
2418. Rubin DH, Althoff RR, Ehli EA, et al. Candidate gene associations with withdrawn behavior. J Child Psychol Psychiatry. 2013 Dec;54(12):1337-45. PMID: 23808549; X-5
2419. Ruble LA, McGrew JH, Toland MD, et al. A Randomized Controlled Trial of Compass Web-Based and Face-to-Face Teacher Coaching in Autism. Journal of Consulting and Clinical Psychology. 2013 June 2013;81(3):566-72. X-5
2420. Ruggeri B, Sarkans U, Schumann G, et al. Biomarkers in autism spectrum disorder: the old and the new. Psychopharmacology (Berl). 2013 Oct 6PMID: 24096533; X-5
2421. Russell AJ, Jassi A, Fullana MA, et al. Cognitive behavior therapy for comorbid obsessive-compulsive disorder in high-functioning autism spectrum disorders: A randomized controlled trial. Depression and Anxiety. 2013;30(8):697-708. X-5
2422. Saemundsen E, Magnusson P, Georgsdottir I, et al. Prevalence of autism spectrum disorders in an Icelandic birth cohort. BMJ Open. 2013;3(6)PMID: 23788511; X-5
2423. Sahu JK, Gulati S, Sapra S, et al. Effectiveness and safety of donepezil in boys with fragile x syndrome: a double-blind, randomized, controlled pilot study. J Child Neurol. 2013 May;28(5):570-5. PMID: 22752489; X-5
2424. Samadi SA, McConkey R, Kelly G. Enhancing parental well-being and coping through a family-centred short course for Iranian parents of children with an autism spectrum disorder. Autism. 2013 Jan;17(1):27-43. PMID: 22297201; X-5
2425. Sandell C, Kjellberg A, Taylor RR. Participating in diagnostic experience: adults with neuropsychiatric disorders. Scand J Occup Ther. 2013 Mar;20(2):136-42. PMID: 23152985; X-5
2426. Sandiford GA, Mainess KJ, Daher NS. A Pilot Study on the Efficacy of Melodic Based Communication Therapy for Eliciting Speech in Nonverbal Children with Autism. Journal of Autism and Developmental Disorders. 2013 June 2013;43(6):1298-307. X-5
2427. Sandin S, Nygren KG, Iliadou A, et al. Autism and mental retardation among offspring born after in vitro fertilization. JAMA. 2013 Jul 3;310(1):75-84. PMID: 23821091; X-5
2428. Santoleri F, Sorice P, Lasala R, et al. Patient adherence and persistence with Imatinib, Nilotinib, Dasatinib in clinical practice. PLoS One. 2013;8(2):e56813. PMID: 23437249; X-5
2429. Sappok T, Budczies J, Dziobek I, et al. The Missing Link: Delayed Emotional Development Predicts Challenging Behavior in Adults with Intellectual Disability. J Autism Dev Disord. 2013 Sep 4PMID: 24002416; X-5

2430. Sappok T, Diefenbacher A, Budczies J, et al. Diagnosing Autism in a Clinical Sample of Adults with Intellectual Disabilities: How Useful Are the "ADOS" and the "ADI-R"? Research in Developmental Disabilities: A Multidisciplinary Journal. 2013 May 2013;34(5):1642-55. X-5
2431. Scahill L, Aman MG, Lecavalier L, et al. Measuring repetitive behaviors as a treatment endpoint in youth with autism spectrum disorder. Autism. 2013 Nov 20PMID: 24259748; X-5
2432. Scahill L, Hallett V, Aman MG, et al. Brief Report: social disability in autism spectrum disorder: results from Research Units on Pediatric Psychopharmacology (RUPP) Autism Network trials. J Autism Dev Disord. 2013 Mar;43(3):739-46. PMID: 23104617; X-4
2433. Schaaf RC, Benevides T, Mailloux Z, et al. An Intervention for Sensory Difficulties in Children with Autism: A Randomized Trial. J Autism Dev Disord. 2013 Nov 10PMID: 24214165; X-5
2434. Schaaf RC, Benevides TW, Leiby BE, et al. Autonomic Dysregulation During Sensory Stimulation in Children with Autism Spectrum Disorder. J Autism Dev Disord. 2013 Aug 31PMID: 23996198; X-5
2435. Schafer EC, Mathews L, Mehta S, et al. Personal FM systems for children with autism spectrum disorders (ASD) and/or attention-deficit hyperactivity disorder (ADHD): an initial investigation. J Commun Disord. 2013 Jan;46(1):30-52. PMID: 23123089; X-3
2436. Schmidt JD, Luiselli JK, Rue H, et al. Graduated exposure and positive reinforcement to overcome setting and activity avoidance in an adolescent with autism. Behavior Modification. 2013;37(1):128-42. X-5
2437. Schmunk G, Gargus JJ. Channelopathy pathogenesis in autism spectrum disorders. Front Genet. 2013;4:222. PMID: 24204377; X-5
2438. Schneider AB, Codding RS, Tryon GS. Comparing and Combining Accommodation and Remediation Interventions to Improve the Written-Language Performance of Children with Asperger Syndrome. Focus on Autism and Other Developmental Disabilities. 2013 June 2013;28(2):101-14. X-3
2439. Schohl KA, Van Hecke AV, Carson AM, et al. A Replication and Extension of the PEERS Intervention: Examining Effects on Social Skills and Social Anxiety in Adolescents with Autism Spectrum Disorders. J Autism Dev Disord. 2013 Jul 27PMID: 23893101; X-1, X-3
2440. Schubart JR, Camacho F, Leslie D. Psychotropic medication trends among children and adolescents with autism spectrum disorder in the Medicaid program. Autism. 2013 Oct 28PMID: 24165274; X-5
2441. Schwartzberg ET, Silverman MJ. Effects of music-based social stories on comprehension and generalization of social skills in children with autism spectrum disorders: A randomized effectiveness study. The Arts in Psychotherapy. 2013;40(3):331-7. X-1, X-3
2442. Sears KM, Blair K-SC, Iovannone R, et al. Using the prevent-teach-reinforce model with families of young children with ASD. Journal of Autism and Developmental Disorders. 2013;43(5):1005-16. X-3, X-4
2443. Sellers TP, Bloom SE, Samaha AL, et al. Evaluation of some components of choice making. Journal of Applied Behavior Analysis. 2013;46(2):455-64. X-3
2444. Sharma A, Gokulchandran N, Sane H, et al. Autologous bone marrow mononuclear cell therapy for autism: an open label proof of concept study. Stem Cells Int. 2013;2013:623875. PMID: 24062774; X-1
2445. Sharma S, Woolfson LM, Hunter SC. Maladaptive cognitive appraisals in children with high-functioning autism: Associations with fear, anxiety and theory of mind. Autism. 2013 Oct 3PMID: 24092841; X-5
2446. Sharp WG, Jaquess DL, Lukens CT. Multi-Method Assessment of Feeding Problems among Children with Autism Spectrum Disorders. Research in Autism Spectrum Disorders. 2013 January 2013;7(1):56-65. X-5
2447. Shrestha A, Anderson A, Moore DW. Using Point-of-View Video Modeling and Forward Chaining to Teach a Functional Self-Help Skill to a Child with Autism. Journal of Behavioral Education. 2013 June 2013;22(2):157-67. X-3
2448. Shrestha M, Shrestha R. Symptom Recognition to Diagnosis of Autism in Nepal. J Autism Dev Disord. 2013 Nov 29PMID: 24293038; X-5
2449. Siller M, Reyes N, Hotez E, et al. Longitudinal change in the use of services in autism spectrum disorder: Understanding the role of child characteristics, family demographics, and parent cognitions. Autism. 2013 Oct 9PMID: 24108191; X-5
2450. Silva L, Schalock M. Treatment of tactile impairment in young children with autism: results with qigong massage. Int J Ther Massage Bodywork. 2013;6(4):12-20. PMID: 24298297; X-5
2451. Silverman JL, Crawley JN. The promising trajectory of autism therapeutics discovery. Drug Discov Today. 2013 Dec 18PMID: 24362109; X-5
2452. Simonoff E, Taylor E, Baird G, et al. Randomized controlled double-blind trial of optimal dose methylphenidate in children and adolescents with severe attention deficit hyperactivity disorder and intellectual disability. J Child Psychol Psychiatry. 2013 May;54(5):527-35. PMID: 22676856; X-1, X-3, X-4

2453. Simo-Pinatella D, Font-Roura J, Planella-Morato J, et al. Types of Motivating Operations in Interventions with Problem Behavior: A Systematic Review. Behavior Modification. 2013 January 2013;37(1):3-38. X-4
2454. Simpson W, Brown C, Nisbet N, et al. Innovations in Practice: A new model of autism spectrum disorder assessment and diagnosis by multiagency community-based teams in primary schools. Child and Adolescent Mental Health. 2013;18(3):187-90. X-5
2455. Siniscalco D, Bradstreet JJ, Sych N, et al. Perspectives on the Use of Stem Cells for Autism Treatment. Stem Cells Int. 2013;2013:262438. PMID: 24222772; X-5
2456. Skotko BG, Davidson EJ, Weintraub GS. Contributions of a specialty clinic for children and adolescents with Down syndrome. Am J Med Genet A. 2013 Mar;161A(3):430-7. PMID: 23401090; X-5
2457. Smile S, Dupuis A, MacArthur C, et al. Autism Spectrum Disorder Phenotype in Children with Ambulatory Cerebral Palsy: A Descriptive Cross-Sectional Study. Research in Autism Spectrum Disorders. 2013 February 2013;7(2):391-7. X-5
2458. Smith J, Hand L, Dowrick PW. Video Feedforward for Rapid Learning of a Picture-Based Communication System. J Autism Dev Disord. 2013 Sep 26PMID: 24068486; X-3
2459. Sofronoff K, Lee J, Sheffield J, et al. The construction and evaluation of three measures of affectionate behaviour for children with Asperger's syndrome. Autism. 2013 Dec 16PMID: 24343335; X-5
2460. Solomon M, Yoon JH, Ragland JD, et al. The Development of the Neural Substrates of Cognitive Control in Adolescents with Autism Spectrum Disorders. Biol Psychiatry. 2013 Oct 24PMID: 24209777; X-5
2461. Solomon O, Lawlor MC. "And I look down and he is gone": Narrating autism, elopement and wandering in Los Angeles. Social Science & Medicine. 2013;94:106-14. X-5
2462. Song Z, Giannotti T, Reichow B. Resources and services for children with autism spectrum disorders and their families in China. Infants & Young Children. 2013;26(3):204-12. X-5
2463. Soorya L, Kolevzon A, Zweifach J, et al. Prospective investigation of autism and genotype-phenotype correlations in 22q13 deletion syndrome and SHANK3 deficiency. Mol Autism. 2013;4(1):18. PMID: 23758760; X-5
2464. Spek AA, van Ham NC, Nyklicek I. Mindfulness-based therapy in adults with an autism spectrum disorder: a randomized controlled trial. Res Dev Disabil. 2013 Jan;34(1):246-53. PMID: 22964266; X-5
2465. Spoladore A. A Young Boy Grows Away from Autism. Journal of Child Psychotherapy. 2013;39(1):22-38. X-5
2466. Sprinkle EC, Miguel CF. Establishing derived textual activity schedules in children with autism. Behavioral Interventions. 2013;28(3):185-202. X-3, X-5
2467. Srinivasan SM, Bhat AN. A review of "music and movement" therapies for children with autism: embodied interventions for multisystem development. Front Integr Neurosci. 2013;7:22. PMID: 23576962; X-1, X-2, X-3, X-4
2468. Stadnick NA, Drahota A, Brookman-Frazee L. Parent Perspectives of an Evidence-Based Intervention for Children with Autism Served in Community Mental Health Clinics. Journal of Child and Family Studies. 2013;22(3):414-22. X-1, X-3, X-4
2469. Stefansson H, Meyer-Lindenberg A, Steinberg S, et al. CNVs conferring risk of autism or schizophrenia affect cognition in controls. Nature. 2013 Dec 18PMID: 24352232; X-5
2470. Stein JL, Parikshak NN, Geschwind DH. Rare inherited variation in autism: beginning to see the forest and a few trees. Neuron. 2013 Jan 23;77(2):209-11. PMID: 23352155; X-5
2471. Stein TP, Schluter MD, Steer RA, et al. Autism and phthalate metabolite glucuronidation. Journal of Autism and Developmental Disorders. 2013;43(11):2677-85. X-5
2472. Steiner AM, Gengoux GW, Klin A, et al. Pivotal response treatment for infants at-risk for autism spectrum disorders: a pilot study. J Autism Dev Disord. 2013 Jan;43(1):91-102. PMID: 22573001; X-3
2473. Sterling AM, Mailick M, Greenberg J, et al. Language Dysfluencies in Females with the "FMR1" Premutation. Brain and Cognition. 2013 June 2013;82(1):84-9. X-5
2474. Stevenson RA, Wallace MT. Multisensory temporal integration: task and stimulus dependencies. Exp Brain Res. 2013 Jun;227(2):249-61. PMID: 23604624; X-5
2475. Stichter JP, Laffey J, Galyen K, et al. iSocial: Delivering the Social Competence Intervention for Adolescents (SCI-A) in a 3D Virtual Learning Environment for Youth with High Functioning Autism. J Autism Dev Disord. 2013 Jun 28PMID: 23812663; X-1, X-3
2476. Stockler-Ipsiroglu S, van Karnebeek C, Longo N, et al. Guanidinoacetate methyltransferase (GAMT) deficiency: Outcomes in 48 individuals and recommendations for diagnosis, treatment and monitoring. Mol Genet Metab. 2013 Nov 7PMID: 24268530; X-1, X-2, X-3, X-4

2477. Stoppelbein L, Greening L, Luebbe A, et al. The role of cortisol and psychopathic traits in aggression among at-risk girls: Tests of mediating hypotheses. Aggress Behav. 2013 Dec 2PMID: 24302544; X-5
2478. Strickland DC, Coles CD, Southern LB. JobTIPS: A transition to employment program for individuals with autism spectrum disorders. Journal of Autism and Developmental Disorders. 2013;43(10):2472-83. X-5
2479. Sukhodolsky DG, Bloch MH, Panza KE, et al. Cognitive-Behavioral Therapy for Anxiety in Children With High-Functioning Autism: A Meta-analysis. Pediatrics. 2013 Nov;132(5):e1341-50. PMID: 24167175; X-5
2480. Sun X, Allison C, Auyeung B, et al. A Review of Healthcare Service and Education Provision of Autism Spectrum Condition in Mainland China. Research in Developmental Disabilities: A Multidisciplinary Journal. 2013 January 2013;34(1):469-79. X-5
2481. Sun X, Allison C, Auyeung B, et al. Service provision for autism in mainland China: A service providers' perspective. Research in Developmental Disabilities. 2013;34(1):440-51. X-5
2482. Suren P, Roth C, Bresnahan M, et al. Association between maternal use of folic acid supplements and risk of autism spectrum disorders in children. JAMA. 2013 Feb 13;309(6):570-7. PMID: 23403681; X-5
2483. Surette S, Vanderjagt L, Vohra S. Surveys of complementary and alternative medicine usage: a scoping study of the paediatric literature. Complement Ther Med. 2013 Apr;21 Suppl 1:S48-53. PMID: 23578917; X-2, X-5
2484. Sutterland AL, Dieleman J, Storosum JG, et al. Annual incidence rate of schizophrenia and schizophrenia spectrum disorders in a longitudinal population-based cohort study. Social Psychiatry and Psychiatric Epidemiology. 2013;48(9):1357-65. X-5
2485. Sutton LR, Hughes TL, Huang A, et al. Identifying individuals with autism in a state facility for adolescents adjudicated as sexual offenders: A pilot study. Focus on Autism and Other Developmental Disabilities. 2013;28(3):175-83. X-5
2486. Swanson AR, Warren ZE, Stone WL, et al. The diagnosis of autism in community pediatric settings: Does advanced training facilitate practice change? Autism. 2013 Jul 11PMID: 23847130; X-5
2487. Tachibana M, Kagitani-Shimono K, Mohri I, et al. Long-term administration of intranasal oxytocin is a safe and promising therapy for early adolescent boys with autism spectrum disorders. Journal of Child and Adolescent Psychopharmacology. 2013;23(2):123-7. X-3
2488. Taubman MT, Leaf RB, McEachin JJ, et al. A comparison of data collection techniques used with discrete trial teaching. Research in Autism Spectrum Disorders. 2013;7(9):1026-34. X-3
2489. Taylor LJ, Maybery MT, Whitehouse AJ. Moving beyond behaviour-only assessment: Incorporating biomarkers to improve the early detection and diagnosis of autism spectrum disorders. Int J Speech Lang Pathol. 2013 Nov 18PMID: 24236911; X-5
2490. Tchanturia K, Smith E, Weineck F, et al. Exploring autistic traits in anorexia: a clinical study. Mol Autism. 2013 Nov 12;4(1):44. PMID: 24220604; X-5
2491. Thapar A, Cooper M, Eyre O, et al. Practitioner Review: What Have We Learnt about the Causes of ADHD? Journal of Child Psychology and Psychiatry. 2013;54(1):3-16. X-5
2492. Thompson GA, McFerran KS, Gold C. Family-centred music therapy to promote social engagement in young children with severe autism spectrum disorder: a randomized controlled study. Child Care Health Dev. 2013 Nov 22PMID: 24261547; X-5
2493. Tostanoski A, Lang R, Raulston T, et al. Voices from the past: Comparing the rapid prompting method and facilitated communication. Dev Neurorehabil. 2013 Oct 8PMID: 24102487; X-2, X-5
2494. Towle PO, Vacanti-Shova K, Shah S, et al. School-Aged Functioning of Children Diagnosed with Autism Spectrum Disorder Before Age Three: Parent-Reported Diagnostic, Adaptive, Medication, and School Placement Outcomes. J Autism Dev Disord. 2013 Dec 18PMID: 24346492; X-5
2495. Travers JC, Tincani M, Krezmien MP. A Multiyear National Profile of Racial Disparity in Autism Identification. Journal of Special Education. 2013;47(1):41-9. X-5
2496. Treasure J. Coherence and other autistic spectrum traits and eating disorders: building from mechanism to treatment. The Birgit Olsson lecture. Nord J Psychiatry. 2013 Feb;67(1):38-42. PMID: 22468644; X-5
2497. Trembath D, Vivanti G. Problematic but predictive: Individual differences in children with autism spectrum disorders. Int J Speech Lang Pathol. 2013 Dec 18PMID: 24345003; X-2, X-5
2498. Trevarthen C, Delafield-Butt JT. Autism as a developmental disorder in intentional movement and affective engagement. Front Integr Neurosci. 2013;7:49. PMID: 23882192; X-5
2499. Tsiouris JA, Kim S-Y, Brown TW, et al. Prevalence of Psychotropic Drug Use in Adults with Intellectual Disability: Positive and Negative Findings from a Large Scale Study. Journal of Autism and Developmental Disorders. 2013;43(3):719-31. X-5

2500. Tureck K, Matson JL, Turygin N, et al. Rates of psychotropic medication use in children with ASD compared to presence and severity of problem behaviors. Research in Autism Spectrum Disorders. 2013;7(11):1377-82. X-1, X-4
2501. Turygin N, Matson JL, Tureck K. The relationship of attention-deficit hyperactivity disorder and autism spectrum disorder to adaptive skills in young children. Dev Neurorehabil. 2013 Dec 4PMID: 24303981; X-5
2502. Ung D, Wood JJ, Ehrenreich-May J, et al. Clinical characteristics of high-functioning youth with autism spectrum disorder and anxiety. Neuropsychiatry (London). 2013 Apr;3(2)PMID: 24179485; X-5
2503. Vaiouli P, Grimmet K, Ruich LJ. "Bill is now singing": Joint engagement and the emergence of social communication of three young children with autism. Autism. 2013 Nov 19PMID: 24254638; X-3
2504. van der Meer L, Kagohara D, Roche L, et al. Teaching multi-step requesting and social communication to two children with autism spectrum disorders with three AAC options. AAC: Augmentative and Alternative Communication. 2013;29(3):222-34. X-3
2505. van Gelder MM, Bretveld RW, Roukema J, et al. Rationale and design of the PRegnancy and Infant DEvelopment (PRIDE) Study. Paediatr Perinat Epidemiol. 2013 Jan;27(1):34-43. PMID: 23215710; X-5
2506. Van Hecke AV, Stevens S, Carson AM, et al. Measuring the Plasticity of Social Approach: A Randomized Controlled Trial of the Effects of the PEERS Intervention on EEG Asymmetry in Adolescents with Autism Spectrum Disorders. J Autism Dev Disord. 2013 Jun 28PMID: 23812665; X-1, X-3
2507. van Steensel FJ, Bogels SM, de Bruin EI. Psychiatric Comorbidity in Children with Autism Spectrum Disorders: A Comparison with Children with ADHD. Journal of Child and Family Studies. 2013;22(3):368-76. X-5
2508. Vandermeer J, Beamish W, Milford T, et al. iPad-presented social stories for young children with autism. Dev Neurorehabil. 2013 Jul 1PMID: 23815083; X-3
2509. Vannucchi G, Masi G, Toni C, et al. Clinical features, developmental course, and psychiatric comorbidity of adult autism spectrum disorders. CNS Spectr. 2013 Dec 19:1-8. PMID: 24352005; X-5
2510. Vaz I. Visual symbols in healthcare settings for children with learning disabilities and autism spectrum disorder. Br J Nurs. 2013 Feb 14-28;22(3):156-9. PMID: 23411823; X-5
2511. Veiby G, Daltveit AK, Schjolberg S, et al. Exposure to antiepileptic drugs in utero and child development: a prospective population-based study. Epilepsia. 2013 Aug;54(8):1462-72. PMID: 23865818; X-5
2512. Verpelli C, Galimberti I, Gomez-Mancilla B, et al. Molecular basis for prospective pharmacological treatment strategies in intellectual disability syndromes. Dev Neurobiol. 2013 May 22PMID: 23695997; X-5
2513. Vicario CM, Nitsche MA. Non-invasive brain stimulation for the treatment of brain diseases in childhood and adolescence: state of the art, current limits and future challenges. Front Syst Neurosci. 2013;7:94. PMID: 24324410; X-5
2514. Virues-Ortega J, Rodríguez V, Yu CT. Prediction of treatment outcomes and longitudinal analysis in children with autism undergoing intensive behavioral intervention. International Journal of Clinical and Health Psychology. 2013;13(2):91-100. X-5
2515. Vismara LA, Young GS, Rogers SJ. Community Dissemination of the Early Start Denver Model: Implications for Science and Practice. Topics in Early Childhood Special Education. 2013;32(4):223-33. X-1, X-3, X-4
2516. Visser JC, Rommelse N, Vink L, et al. Narrowly versus broadly defined autism spectrum disorders: differences in pre- and perinatal risk factors. J Autism Dev Disord. 2013 Jul;43(7):1505-16. PMID: 23076505; X-5
2517. Vivanti G, Dissanayake C, Zierhut C, et al. Brief report: Predictors of outcomes in the Early Start Denver Model delivered in a group setting. J Autism Dev Disord. 2013 Jul;43(7):1717-24. PMID: 23124361; X-5
2518. Volkmar FR, Reichow B. Infants and toddlers with autism: The promise and the challenges. Int J Speech Lang Pathol. 2013 Dec 18PMID: 24345000; X-2, X-5
2519. Voos AC, Pelphrey KA, Tirrell J, et al. Neural mechanisms of improvements in social motivation after pivotal response treatment: Two case studies. Journal of Autism and Developmental Disorders. 2013;43(1):1-10. X-3
2520. Wainer AL, Ingersoll BR. Disseminating ASD interventions: a pilot study of a distance learning program for parents and professionals. J Autism Dev Disord. 2013 Jan;43(1):11-24. PMID: 22547028; X-3
2521. Wake R, Miyaoka T, Inagaki T, et al. Yokukansan (TJ-54) for irritability associated with pervasive developmental disorder in children and adolescents: A 12-week prospective, open-label study. Journal of Child and Adolescent Psychopharmacology. 2013;23(5):329-36. X-1
2522. Walsh S, Horgan J, May RJ, et al. Facilitating relational framing in children and individuals with developmental delay using the relational completion procedure. J Exp Anal Behav. 2013 Dec 11PMID: 24338682; X-3, X-5

2523. Walton KM, Ingersoll BR. Improving Social Skills in Adolescents and Adults with Autism and Severe to Profound Intellectual Disability: A Review of the Literature. Springer. 233 Spring Street, New York, NY 10013.; 2013. p. 594-615. X-4
2524. Wang L, Mandell DS, Lawer L, et al. Healthcare service use and costs for autism spectrum disorder: A comparison between Medicaid and private insurance. Journal of Autism and Developmental Disorders. 2013;43(5):1057-64. X-5
2525. Wang Q, Sourina O. Real-time mental arithmetic task recognition from EEG signals. IEEE Trans Neural Syst Rehabil Eng. 2013 Mar;21(2):225-32. PMID: 23314778; X-5
2526. Wang X, Bey AL, Chung L, et al. Therapeutic approaches for shankopathies. Dev Neurobiol. 2013 Mar 27PMID: 23536326; X-5
2527. Ward SC, Whalon K, Rusnak K, et al. The association between therapeutic horseback riding and the social communication and sensory reactions of children with autism. Journal of Autism and Developmental Disorders. 2013;43(9):2190-8. X-5
2528. Ware TL, Earl J, Salomons GS, et al. Typical and atypical phenotypes of PNPO deficiency with elevated CSF and plasma pyridoxamine on treatment. Dev Med Child Neurol. 2013 Nov 23PMID: 24266778; X-5
2529. Waris P, Lindberg N, Kettunen K, et al. The relationship between Asperger's syndrome and schizophrenia in adolescence. Eur Child Adolesc Psychiatry. 2013 Apr;22(4):217-23. PMID: 23065028; X-5
2530. Warren ZE, Zheng Z, Swanson AR, et al. Can Robotic Interaction Improve Joint Attention Skills? J Autism Dev Disord. 2013 Sep 8PMID: 24014194; X-3
2531. Wass SV, Porayska-Pomsta K. The uses of cognitive training technologies in the treatment of autism spectrum disorders. Autism. 2013 Oct 15PMID: 24129912; X-2, X-5
2532. Wehman PH, Schall CM, McDonough J, et al. Competitive Employment for Youth with Autism Spectrum Disorders: Early Results from a Randomized Clinical Trial. J Autism Dev Disord. 2013 Jul 27PMID: 23893098; X-5
2533. Weiss JA, Viecili MA, Sloman L, et al. Direct and Indirect Psychosocial Outcomes for Children with Autism Spectrum Disorder and their Parents Following a Parent-involved Social Skills Group Intervention. J Can Acad Child Adolesc Psychiatry. 2013 Nov;22(4):303-9. PMID: 24223050; X-5
2534. Weitlauf AS, Gotham KO, Vehorn AC, et al. Brief Report: DSM-5 "Levels of Support:" A Comment on Discrepant Conceptualizations of Severity in ASD. J Autism Dev Disord. 2013 Jun 28PMID: 23812664; X-5
2535. Whitby PJ. The Effects of "Solve It!" on the Mathematical Word Problem Solving Ability of Adolescents with Autism Spectrum Disorders. Focus on Autism and Other Developmental Disabilities. 2013 June 2013;28(2):78-88. X-5
2536. White SJ. The Triple I Hypothesis: taking another('s) perspective on executive dysfunction in autism. J Autism Dev Disord. 2013 Jan;43(1):114-21. PMID: 22584617; X-5
2537. White SW, Ollendick T, Albano AM, et al. Randomized controlled trial: Multimodal anxiety and social skill intervention for adolescents with autism spectrum disorder. Journal of Autism and Developmental Disorders. 2013;43(2):382-94. X-5
2538. White SW, Smith LA, Schry AR. Assessment of global functioning in adolescents with autism spectrum disorders: Utility of the Developmental Disability-Child Global Assessment Scale. Autism. 2013 Aug 21PMID: 23965288; X-5
2539. Whitehouse AJO, Holt BJ, Serralha M, et al. Maternal vitamin D levels and the autism phenotype among offspring. Journal of Autism and Developmental Disorders. 2013;43(7):1495-504. X-5
2540. Wiggins LD, Robins DL, Yeargin-Allsopp M. Short report: Improving record–review surveillance of young children with an autism spectrum disorder. Autism. 2013;17(5):623-9. X-5
2541. Williams K, Brignell A, Randall M, et al. Selective serotonin reuptake inhibitors (SSRIs) for autism spectrum disorders (ASD). Cochrane Database Syst Rev. 2013;8:CD004677. PMID: 23959778; X-5
2542. Williamson RL, Casey LB, Robertson JS, et al. Video Self-Modeling in Children with Autism: A Pilot Study Validating Prerequisite Skills and Extending the Utilization of VSM across Skill Sets. Assistive Technology. 2013 2013;25(2):63-71. X-3
2543. Wilson BJ, Berg JL, Zurawski ME, et al. Autism and Externalizing Behaviors: Buffering Effects of Parental Emotion Coaching. Research in Autism Spectrum Disorders. 2013 June 2013;7(6):767-76. X-4
2544. Wilson BJ, Manangan CN, Dauterman HA, et al. ADHD Symptoms Moderate the Relation Between ASD Status and Internalizing Symptoms in 3-6-Year-Old Children. J Autism Dev Disord. 2013 Nov 16PMID: 24242972; X-5
2545. Wilson KP. Incorporating video modeling into a school-based intervention for students with autism spectrum disorders. Lang Speech Hear Serv Sch. 2013 Jan;44(1):105-17. PMID: 23087158; X-5

2546. Winarni TI, Utari A, Mundhofir FE, et al. Fragile X Syndrome: Clinical, Cytogenetics and Molecular Screening among Autism Spectrum Disorder Children in Indonesia. Clin Genet. 2013 Jan 16PMID: 23320543; X-5
2547. Wincik S. Learning from Katie. Nursing. 2013 Jul;43(7):40-1. PMID: 23778213; X-5
2548. Wolff JJ, Hupp SC, Symons FJ. Brief report: Avoidance extinction as treatment for compulsive and ritual behavior in autism. J Autism Dev Disord. 2013 Jul;43(7):1741-6. PMID: 23179345; X-5
2549. Wolff JJ, Symons FJ. An evaluation of multi-component exposure treatment of needle phobia in an adult with autism and intellectual disability. Journal of Applied Research in Intellectual Disabilities. 2013;26(4):344-8. X-5
2550. Won H, Mah W, Kim E. Autism spectrum disorder causes, mechanisms, and treatments: focus on neuronal synapses. Front Mol Neurosci. 2013;6:19. PMID: 23935565; X-5
2551. Wong KA, Zisengwe G, Athanasiou T, et al. Outpatient laser ablation of non-muscle-invasive bladder cancer: is it safe, tolerable and cost-effective? BJU Int. 2013 Sep;112(5):561-7. PMID: 23819486; X-5
2552. Woo CC, Leon M. Environmental enrichment as an effective treatment for autism: A randomized controlled trial. Behavioral Neuroscience. 2013;127(4):487-97. X-5
2553. Wu MS, McGuire JF, Arnold EB, et al. Psychometric Properties of the Children's Yale-Brown Obsessive Compulsive Scale in Youth with Autism Spectrum Disorders and Obsessive-Compulsive Symptoms. Child Psychiatry Hum Dev. 2013 Jul 5PMID: 23827959; X-1, X-4
2554. Xu P, Grueter BA, Britt JK, et al. Double deletion of melanocortin 4 receptors and SAPAP3 corrects compulsive behavior and obesity in mice. Proc Natl Acad Sci U S A. 2013 Jun 25;110(26):10759-64. PMID: 23754400; X-5
2555. Yakubova G, Taber-Doughty T. Brief Report: Learning via the Electronic Interactive Whiteboard for Two Students with Autism and a Student with Moderate Intellectual Disability. Journal of Autism and Developmental Disorders. 2013 June 2013;43(6):1465-72. X-3
2556. Yanardag M, Akmanoglu N, Yilmaz I. The effectiveness of video prompting on teaching aquatic play skills for children with autism. Disabil Rehabil. 2013 Jan;35(1):47-56. PMID: 22624856; X-3
2557. Yazawa M, Dolmetsch RE. Modeling Timothy syndrome with iPS cells. J Cardiovasc Transl Res. 2013 Feb;6(1):1-9. PMID: 23299782; X-5
2558. Zachor DA, Curatolo P. Recommendations for early diagnosis and intervention in autism spectrum disorders: An Italian-Israeli consensus conference. Eur J Paediatr Neurol. 2013 Sep 25PMID: 24095105; X-5
2559. Zerbo O, Iosif AM, Walker C, et al. Is maternal influenza or fever during pregnancy associated with autism or developmental delays? Results from the CHARGE (CHildhood Autism Risks from Genetics and Environment) study. J Autism Dev Disord. 2013 Jan;43(1):25-33. PMID: 22562209; X-5
2560. Zito JM, Burcu M, Ibe A, et al. Antipsychotic use by medicaid-insured youths: impact of eligibility and psychiatric diagnosis across a decade. Psychiatr Serv. 2013 Mar 1;64(3):223-9. PMID: 23242390; X-4, X-5

Appendix F. Characteristics and Outcomes of Studies of Early Intensive Behavioral and Developmental Interventions

Table F-1. Characteristics and outcomes of early intensive behavioral and developmental intervention studies

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months ± SD IQ, Mean ± SD	Intervention Provider Intervention Setting	Intervention Manualized?	Intervention Intensity, Duration, And Focus	Key Outcomes
ABA-Based Approaches					
Peters-Scheffer et al. 2013[1] Netherlands **G1:** Low intensity Lovaas-based intervention+specialized preschool, 20/20 **G2:** Specialized preschool, 20/20 Quality: Good	**G1+G2:** 62.52 ± 16.96 (median) **G1:** 40.66 ± 20.1 **G2:** 40.14 ± 18.3	**G1:** Master's trained special education or psychology therapists **G2:** Preschool teachers (no additional information reported) **G1+G2:** Specialized preschools	**G1:** Yes **G2:** NR	**G1:** Mean 4.98±1.45 hours/week one-to-one treatment plus standard specialized preschool for 24 months; intervention included programs focused on compliance/attention, imitation, matching, categorization, PECS, motor skills, language, memory, play, adaptive behavior, academic skills, social interaction/communication **G2:** Hours not reported; standard preschool incorporating TEACCH, PECS, individualized speech therapy, sensory integration, language, play, sensory-motor	• 9/20 participants in G1 received 1 year of treatment vs. 2 years • Developmental age in both groups improved over time, but increase was greater in G1 vs. G2 (p=.001); effect size for change=1.09 • IQ improved significantly from baseline to 12 months (mean 40.66 to 48.17, P<.001) in G1 and remained stable from 12-24 months; no significant change over time in G2 (baseline mean=40.14, 24-month mean=39.42); effect size for change=0.40 • Total Vineland and subscale scores improved in both groups with greater improvements in G1 vs. G2 (p values<.001); effect size for change in total score=1.74 • Receptive language improved at 24 months in G1 vs. G2 (p=.04); expressive language improve over time in both groups but between group differences at 24 months were not significant (effect size for change=0.40) • Both groups generally improved over time on Early Social Communication Scales domains but between group differences were not significant at 24 months

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months ± SD IQ, Mean ± SD	Intervention Provider Intervention Setting	Intervention Manualized?	Intervention Intensity, Duration, And Focus	Key Outcomes
					• Severity ratings (CARS, ADOS) decreased significantly over time for G1 but not G2; effect size for change in ADOS=1.51, CARS=1.50) • Differences between groups in measures of emotional and behavioral problems and behavioral flexibility were not significant • More G1 participants achieved clinical and reliable significant on developmental age, adaptive behavior, interpersonal relationships, play and leisure time, receptive and expressive language, ASD severity, and responding to social interaction vs. G2 • More G2 vs. G1 participants obtained clinical and reliable significance on measures of problem behavior and maternal stress; equal numbers of G1 and G2 participants obtained clinical and reliable significance on IQ, behavioral flexibility, joint attention, behavioral requests, and initiating social interaction • Diagnoses changes from autism to PDD-NOS in 45% of G1 and 20% of G2; 10% in G1 classified as non-autistic at 24 months (0 in G2); level of intellectual disability declined in 55% of G1 and 5% of G2 • Baseline hours of treatment, developmental age, IQ, level of adaptive behavior, play skills , receptive language significant predictors of progress
Dawson et al. 2012[22, 23] US	**G1:** 23.9 ± 4.0 **G2:** 23.1 ± 3.9	**G1:** Trained therapists,	**G1:** Yes **G2:** NR	**G1:** Mean 15.2 ± 1.4 therapist-delivered	1 year outcomes: • Significantly greater improvement in IQ for

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months ± SD IQ, Mean ± SD	Intervention Provider Intervention Setting	Intervention Manualized?	Intervention Intensity, Duration, And Focus	Key Outcomes
G1: ESDM, 24/24 **G2:** Community-based interventions, 24/21 Quality: Good	**G1:** 61.0 ± 9.2 **G2:** 59.4 ± 8.6	clinical psychologist, speech language pathologist, developmental behavioral pediatrician, parents **G2:** Community-based therapists		hours/week + mean 16.3 ± 6.2 parent-delivered hours/week for 24 months, intervention focused on interpersonal exchange, positive affect, shared engagement with real life materials/activities, communication, and adult responsiveness to child cues **G2:** Mean 9.1 hours/week of individual therapy and 9.3 of group delivered interventions, potentially including speech language and occupational therapy, developmental preschool	G1 (154 vs. 22 points) compared with G2 • No adaptive behavior differences 2 year outcomes: • Significantly more improvement in G1 vs. G2 on IQ; receptive language, and expressive language • Adaptive behavior improvements in both groups (all domains except socialization); significantly greater improvements in G1 • No change in ADOS severity scores or repetitive behavior • Diagnostic shift toward milder diagnosis (PDD-NOS) greater for ESDM group • No differences between groups in EEG measurements of perceptual face processing • EEG measures of engagement/cognitive processing comparable to those of typically developing children for G1 children with usable EEG data; 11/15 G1 participants and 4/14 G2 showed faster neural response to faces vs. objects
Peters-Scheffer et al. 2010[2] Netherlands **G1:** Specialized preschool + UCLA/Lovaas-based intervention, 12/12 **G2:** Specialized preschool, 22/22 Quality: Fair	**G1:** 53.5 ± 5.52 **G2:** 52.95 ± 11.14 **G1:** 47.00 ± 10.33 **G2:** 45.73 ± 15.99	**G1:** Psychologist, special educator, preschool teachers and parents with workshop training in ABA techniques **G2:** Psychologist,	**G1:** Yes **G2:** NR	**G1:** Mean 28.38 hours intervention/week for 8 months using elements of TEACCH, incidental and structured teaching, individualized speech, occupational, music therapy plus mean 6.29 hours/week 1:1 Lovaas-based intervention focused on developmental age and adaptive skills	• Both groups improved over time on cognitive and adaptive measures; G1 improved significantly compared with G2 on IQ/developmental age and Vineland composite, communication, daily living, and socialization domains (all p≤.02) • G2 had greater emotional and behavioral problem scores at baseline vs. G1 (p<.05), changes in scores not significant for either group over time • Decreases in symptom severity not

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months ± SD IQ, Mean ± SD	Intervention Provider Intervention Setting	Intervention Manualized?	Intervention Intensity, Duration, And Focus	Key Outcomes
		special educator, preschool teachers **G1+ G2:** Preschool for children with intellectual disabilities		**G2:** Mean 23.38 hours intervention/week using elements of TEACCH, incidental and structured teaching, individualized speech, occupational, music therapy	significant between groups
Itzchak et al. 2011[3, 4] Israel **G1:** ABA-based approach, 45/45 **G2:** Eclectic approach, 33/33 Quality: Fair	**G1:** 25.1 ± 3.9 **G2:** 26.0 ± 4.6 **G1:** 72.2 ± 19.2 **G2:** 73.3 ± 22.2	**G1:** Psychology or special education master's trained board certified behavior analysts, trained therapists, speech language pathologists, occupational therapists, preschool teachers **G2:** Clinical psychologist, special education preschool teacher, speech language pathologist, occupational	**G1:** NR **G2:** NR	**G1:** 20 hours/week for 12 months, 1:1 intervention with focus on language, play, social, emotional, academic, adaptive skills, and reducing inappropriate behavior **G2:**19 hours/week for 12 months, 1:1 intervention and parental involvement in intervention 1 day/week; overall treatment integrated developmental approaches	• Overall high level of diagnostic stability from baseline to end of 12-month intervention: 91% of children retained autism diagnosis. Classification improved for 3 G1 and 2 G2 participants and deteriorated for 2 children in G1 • Cognitive abilities (Mullen Scales) and overall Vineland raw scores improved in both groups (p<.001) over time; no significant differences between groups at followup; overall Vineland standard scores improved for both groups (p<.05) • Vineland motor skills domain decreased over time for both groups (p<.001) • Children in G1+G2 with lower severity (ADOS) improved significantly more than those with higher severity on cognitive and adaptive measures; both groups declined on measures of motor skills, with greater decline for those with higher severity • G2 participants with lower severity improved significantly on Vineland communication and socialization measures compared with G1 (p<.001)

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months ± SD IQ, Mean ± SD	Intervention Provider Intervention Setting	Intervention Manualized?	Intervention Intensity, Duration, And Focus	Key Outcomes
		therapist, cognitive trainer, music therapist, teacher's aids **G1+G2:** Autism-specific preschools			• In analyses combining G1 and G2, higher cognitive abilities at baseline, particularly verbal abilities, and older maternal age were associated with greater adaptive skills at followup (p<.05) • Among those with greater severity, greater verbal ability was associated with better adaptive skills at followup (r=.672, p<.001) • Cognitive gains were greater for those with lower severity (p<.01) and older, more educated mothers (p values <.001, .05); younger children had a better chance of cognitive improvement with intervention (p=NS)
Strain et al. 2011[5] US **G1**: LEAP program with coaching and training, 28 classrooms (27 analyzed)/177 children **G2**: LEAP intervention manuals only, 28 classrooms (23 analyzed)/117 children Quality: Fair	**G1:** 50.1 ± 4.6 **G2:** 50.7 ± 4.2 **G1:** 59.6 ± 6.9 **G2:** 63.2 ± 6.6	**G1+G2:** Preschool teachers **G1+G2:** Preschool	**G1+G2:** Yes	**G1:**2 years intervention, mean 17 hours/week (teachers received 23 full days coaching/training), peer mediated social skills, incidental teaching, pivotal response training, PECS, positive behavior support **G2:** 2 years intervention, mean 17 hours/week, intervention as above, no specific training for teachers beyond provision of LEAP manual	• Significant gains on CARS, language, cognitive, and social skills measures for G1 vs. G2 (p<.05) • G1 improved by 18.5 points compared with 9.4 for G2 on the Preschool Language Scale (effect size difference=0.92, p<.01) • G1 improved by 28.6 points compared with 12 for G2 on socials skills rating (effect size difference=1.22, p<.01) • Greater intervention fidelity associated with better outcomes on all measures
Eldevik et al. 2012[6] Norway **G1:** Preschool-based EIBI,	**G1:** 42.2 ± 9.0 **G2:** 46.2 ± 12.4 **G1:** 51.6 ± 16.9	**G1:** Board certified behavior analyst and	**G1:** Yes **G2:** NR	**G1:** Mean 13.6 hours/week over 24 months, ABA-based EIBI intervention using	• Greater gains in cognitive outcomes (p=.004) and overall adaptive behavior (p=.036) , Vineland communication (p=.034)

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31/31 **G2:** Usual care preschool, 12/12 Quality: Fair	**G2:** 51.7 ± 18.1	psychologist, bachelor's trained therapists with ABA-training **G2:** Special education teacher, trained therapists **G1+G2:** Preschool		discrete trial training, operant conditioning to promote communication, gross and fine motor skills, play and social skills, adaptive behavior **G2:** Mean 5+ hours/week over 24 months, intervention including elements of alternative communication, ABA-based approaches, sensory motor skills, TEACCH, adaptive and communication skills	and socialization (p=.008) for G1 vs. G2; no significant differences in Vineland daily living skills between groups • Effect size for change in IQ=1.03 (95% CI: .34 to 1.72) and for change in overall adaptive behavior=.73 (95% CI: .05 to 1.36) • Baseline age and PDD-NOS or Asperger diagnosis correlated with larger gains in overall adaptive behavior, communication, and daily living skills; baseline IQ positively correlated with Vineland socialization gains
Eikeseth et al. 2012 [7] Norway/Sweden **G1:** EIBI, 35/13-15 depending on outcome **G2:** Standard care, 24 / NR Quality: Fair	**G1:** 3.9 ± 0.9 years **G2:** 4.4 ± 1.2 years Vineland age equivalent: **G1:** 1.9 ± 0.9 **G2:** 2.1 ± 0.8	**G1**: Therapist, parents, Supervisor from Banyan Center, school staff **G2**: Special education teacher, teacher assistant **G1**+**G2**: Mainstream public preschools or kindergartens, and home	**G1**:Yes **G2**:NR	**G1**: One year of 15 to 37 hours-per-week, with an estimated mean of 23 hours ± 5.3 comprehensive intervention focused on adapative behavior, ASD severity **G2**: individual special education program	• G1 scored significantly higher on all Vineland scales as compared to G2 (p<0.05) with an effect size of Total (composite)=0.92, Communication=1.08, ADL=0.71, Socialization=0.75,Motor=0.70, and Learning rate=0.97 • G1: CARS scores continued to decrease significantly during the second year of treatment (from 31.8 (SD=8.5) to 27.2 (SD=6.2), p<.05), effect size of 0.59 • Children receiving G1 scored significantly higher on standard scores of adaptive behavior • Significant improvements were found in maladaptive behaviors and excess and deficit behaviors as compared to G2 • Largest gains were observed during the first year. Effect size on all measures at year one

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					were moderate to large
Flanangan et al. 2012[8-13] Canada **G1:** Intensive behavioral intervention, 61/61 **G2:** Wait list control (matched by age), 61/61 Quality: Fair	**G1:** 42.93 ± 11.53 **G2:** 42.79 ± 10.51 NR	**G1:** Trained instructor therapists, masters-degreed or certified behavior analyst supervisors, psychologists **G2:** Community-based interventionists **G1:** Specialized centers, preschools, home **G2:** Community-based with multiple settings	**G1:** No **G2:** NR	**G1:**Mean 25.81 ± 3.44 hours intervention/week for varied time period depending on age at enrollment, ABA-based, center- and home-based, publicly funded intervention incorporating discrete trial training and naturalistic approaches and curricula focusing on impairments of a specific child **G2:** Mean 17.9 ± 12.3 hours/week of school based services and <10 hours/week of behavioral intervention; community based interventions including low intensity ABA, speech therapy, occupational therapy, behavioral consultation	• In 2008 retrospective case series (Perry 2008) reporting on ~30% of G1 participants ASD severity (CARS), cognitive level, adaptive behavior, and rate of development improved significantly (all p<.001); outcomes varied across children: approximately 25% showed substantial improvements, 30% showed clinically significant improvement, 19% showed some/modest improvement, 25% showed no improvement or worsening of outcome. Analyses of a subset of the total participants (n=89) showed similar improvements (Freeman 2010) • Age (younger at baseline), IQ, adaptive behavior, and ASD severity were correlated with outcome; IQ was strongest predictor, accounting for 5-12% of the variance in outcomes (Perry 2011); in sub-set analysis (Shine 2010), duration of intervention also associated with better outcomes • In 151 participants with parental stress data available, higher maternal stress at baseline was correlated with lower child adaptive behavior skills at end of intervention (p<.01) (Shine 2010) • ASD severity improved for G1 vs. G2 as did Vineland composite standard and ratio scores and IQ estimates (p values ≤ .033, effect sizes ranging from 0.53 to 0.83); 19 point difference in IQ at end of intervention in favor of G1

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					• Younger age at intervention and higher adaptive skills associated with better outcomes; adaptive skills also associated with better outcomes for G2. Duration of intervention became nonsignificant after intervention type was entered into statistical models (Flanagan 2012) • In retrospective analyses (Perry 2013), higher baseline IQ predicted gains in IQ, and children starting early intervention at younger ages (2-5 yrs) gained significantly more IQ points (mean 17 points vs. mean 2 points) than children entering intervention at older ages (6-13 yrs); differences in adaptive behavior gains were not significant
Boyd et al. 2013[14] US **G1:** TEACCH preschools, 85/81 **G2:** LEAP preschools, 54/48 **G3:** Non-model specific preschools, 59/56 Quality: Fair	**G1:** 48 ± 6.84 **G2:** 47.52 ± 8.4 **G3:** 48.84 ± 7.68 NR	**G1:** Teachers in high fidelity TEACCH programs **G2:** Teachers in high fidelity LEAP programs **G3:** Teachers in inclusive or special education preschools **G1+G2+G3:** Preschools	**G1:** Yes **G2:** Yes **G3:** No	**G1:** Half or full school day for 6 months of cognitive social learning based intervention that uses visual schedules and other modifications to the environment to promote learning and engagement **G2:** Half day for 6 months of interventions blending ABA and early childhood education techniques and peer mediation and focused on reducing ASD characteristics to promote learning **G3:** Half or full day for 6	• Groups differed at baseline on autism characteristics and severity (p=.0013), communication (p<.001), parent-rated reciprocal social interaction (p=.0241) and fine motor (p=.0066) composite scores • All groups showed significant change over time on the autism characteristics and severity, fine motor, and communication composites (p values ≤.05); G1 and G2 improved on teacher-rated reciprocal social interaction (p≤.05). G1 improved on parent-rated reciprocal social interaction (p<.05) • No significant differences among groups on any measure at followup • Children with higher Mullen scores made fewer gains in G1; children with high Preschool Language Scale scores at baseline had higher communication and

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				months, inclusive or special education preschool	autism characteristics and severity composite scores in G1 • Females in G2 had smaller communication gains, although few females in study overall (n=33)
Kovshoff et al. 2011[15, 16] UK **G1:** EIBI (publicly-funded or privately purchased), 23/23 **G2:** Usual care, 21/18 Quality: Poor	**G1:** 35.7 ± 4.0 **G2:** 38.4 ± 4.4 **G1:** 61.43 ± 16.43 **G2:** 62.33 ± 16.64	**G1:** Trained behavior analysts and special educators **G2:** NR **G1:** Home **G2:** Community-based interventions	**G1:** NR **G2:** NR	**G1:** Mean 25.6 hours/week 1:1 teaching for 24 months, ABA-based intervention using discrete trial training in natural environment to improve, language, social skills, behavior **G2:** Hours of intervention over 24 months NR, intervention included speech therapy, PECS, TEACCH, medications, and other approaches as provided in the community	• Groups differed significantly on age at baseline (p<.05) • IQ, mental age, and language comprehension improved significantly for G1 vs. G2 after 24 months of intervention (p≤.05); effect size for IQ change=0.77 • Vineland daily living and motor skills scores improved for G1 vs. G2 (p<.05) but composite, communication, severity, and socialization scores did not differ significantly between groups at the 24 month followup • Parents noted more positive social behavior for G1 vs. G2 at the 24 month followup • Intervention responders had higher IQ, higher mental age, higher Vineland composite, communication, and socialization scores, lower motor skills, more behavior problems, and more autistic symptoms and fewer hours of intervention in Year 2 • At followup of 41 participants 2 years after the end of the 24-month intervention, 14/23 G1 and 4/18 G2 children in mainstream education settings (p=.013), most receiving some 1:1 support • At 2-year followup no significant group differences in IQ, adaptive behavior, communication, socialization, or behavior; more G1 participants achieved standard

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					score on receptive language measure vs. G2 (p=.048) • In analyses of G1 participants in privately purchased vs. publicly funded EIBI programs, IQ declined for the publicly funded group compared with the control or privately purchased participants (p<.0001); privately purchased participants maintained IQ and adaptive behavior gains from end of intervention to the 2 year followup. Publicly funded group had more severe ASD symptoms, lower adaptive behavior, and received less intensive intervention than the privately purchased group
Parent Training					
Schreibman et al. 2013[17] US **G1:** Pivotal Response Training (PRT), 20/20 **G2:** PECS, 19/19 Quality: Good	**G1:** 29.5 ± 6.9 **G2:** 28.9 ± 4.2 NR	**G1+G2:** Trained therapists, parents **G1+G2:** Home	**G1:** Yes **G2:** Yes	**G1+G2:** Mean 247 hrs treatment over 23 weeks, G1 focused on motivational techniques delivered by parents to facilitate communication. G2 focused on motivational techniques to facilitate augmented communication	• Children in both G1 and G2 showed gains in language from baseline to followup 3 months after the end of treatment but no between group differences reported; effect sizes for change ranged from .001 to .486 • In the PECS group 12/19 children mastered requesting and were learning to comment using pictures • Mean number of spoken words gained across groups=80; individual progress varied widely , with 78% of children using at least 10 spoken words at final followup
Strauss et al, 2012 [18, 19] Italy **G1**: Staff and parent mediated EIBI, 24/24	**G1**: 55.67 ± 17.63 **G2**: 41.94 ± 13.07 GMDS-ER GQ **G1**: 55.65 ± 20.06	**G1**+**G2**: Staff and parents **G2**: Parents **G1**:	**G1**: No **G2**: No	**G1:** For 12 months, alternated between one week of 25 hours of therapist-led center-based intervention and 3	• Compared to G2, children in G1 showed significant decrease in autism symptom severity, increases in language production and mental development • Compared to G1, children in G2 had

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G2: Eclectic, 20/20 Quality: Good	**G2**: 74.29 ± 29.37	Treatment center and home **G2**: Home		weeks of an average of 14 hours/week parent-led home intervention. Focus on individual skills, problem behaviors, and facilitated play and social interaction **G2**: In-home developmental intervention and cognitive behavioral treatment for approximately 12 hours/week. Focus determined by staff expertise and preferences.	improved parent-reported socialization and motor skills • In G1, older children achieved better adaptive behavior outcomes; younger children made more gains in early language comprehension and production. Children who gained more language comprehension had higher adaptive behavior scores pre-treatment. Pre-treatment language comprehension predicted post-treatment language production • In G2, higher pre-treatment mental development state and early language skills predicted better outcome on adaptive behaviors. Initial higher adaptive behaviors predicted better post-treatment early language comprehension. • In both groups, child outcomes on early language skills, mental developmental state and adaptive behaviors were significantly influenced by parental stress, child ability to respond correctly to prompts, number and difficulty of treatment targets, and child problem behaviors in sessions. The predictive power of parental stress on outcome autism severity was modified by perception of difficult child, with higher perceptions of difficulty associated with lower decreases in autism severity • Less parent inclusion in treatment provision resulted in decreased perceptions of a difficult child and less parental stress
Landa et al. 2012[20, 21]	**G1:** 28.6 ± 2.6	**G1:** Trained	**G1:** Yes	**G1:** Mean 205.66 ±	• Greater socially engaged imitation in G1

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US **G1:** Assessment Evaluation and Programming System for Infants and Children (AEPS) curriculum+additional joint attention and social interaction opportunities, 25/24 **G2:** AEPS curriculum, 25/24 Quality: Good	**G2:** 28.8 ± 2.8 **G1+G2:** 60.1 ± 11.9	interventionist + parent **G2:** Trained interventionist + parent **G1+G2:** Specialized clinic classroom	(AEPS), NR (additional joint attention) **G2:** Yes	18.63 hours of intervention over 6 months, intervention included elements of discrete trial training, pivotal response training, routines-based interaction, augmented communication, and visual cues and structure + orchestrated opportunities for initiation of joint attention(IJA), shared positive affect (SPA), and socially engaged imitation (SEI) **G2:** Mean 196±21 hours intervention over 6 months, intervention included elements of discrete trial training, pivotal response training, routines-based interaction, augmented communication, and visual cues and structure	compared with G2 at end of intervention and at 6-month followup (effect size=0.86, p.01); growth occurred during intervention period vs. followup period • Initiations of joint attention did not differ significantly between groups at the 6-month followup, though each group improved over time • Measures of expressive language and nonverbal cognition did not differ between groups at the 6-month followup • At long-term followup of G1+G2 (n=34) at mean 37.6 months after end of intervention (mean age=72.6 ± 17.5 months), IQ and Vineland communication scores increased from baseline (mean change 21.4 ± 22.9, effect size=1.02, p<.001 and 12.7 ± 19.4, effect size=0.81, p<.001, respectively) • No change in symptom severity (ADOS) at the long-term followup
Roberts et al. 2011[24] Australia **G1**: Individualized home-based program, 34/27 **G2**: Small group center-based program combined with parent training and support group, 33/29	**Age:** **G1**: 41.5 **G2**: 43.1 **G3:** 43.7 **IQ:** **G1**: 57 ± 11.7 **G2**: 66 ± 17.7 **G3:** 63.3 ± 15.5	**G1**+**G2**+**G3**: Multidisciplinary teams of teachers, speech pathologists, occupational therapists and psychologists	**G1**: NR **G2**: Yes **G3:** NA	**G1**: 2 hour visit every 2 weeks, 20 sessions max, 40 weeks duration, focused on communication, social skills, adaptive functioning and psychopathology, parent stress **G2**: weekly 2 hour	• Significant greater improvement in Reynell comprehension standard score for G2 compared to G1 (-7.3; 95% CI: -13.9 to - 0.7, p=0.02) • Greater improvement for expression standard score of the Reynell for the G2 compared to G1 (-3.0; 95% CI: -9.0, to 2.9, p=0.31 • Reynell standard comprehension and

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G3: Waitlist, 28/28 Quality: Good		**G1**:Home **G2**:Center **G3:** home/center		sessions, 40 weeks duration, six playgroups of 4–6 children, with six concurrent parent support and training groups, focused on communication, social skills, adaptive functioning and psychopathology, parent stress **G3:** Waiting list	expression scores **G3** performed better than G1, but not significantly • For the Reynell standard comprehension and expression scores G2 performed better than **G3** but not significantly. • **G3** improved significantly more G1 on the Vineland socialization scale • There were no statistically significant differences among the three groups for other child outcomes. When analyses were limited only to children with autism spectrum diagnoses, the magnitude of the effects increased but the presence or absence of statistical significance did not. • Parent outcomes: Parenting: statistically significant differences favoring G2 vs. G1 • No significant difference between groups for stress
Aldred et al. 2011[25, 26] UK **G1:** Parent training in social communication intervention plus community intervention, 14/14 **G2:** Community intervention, 14/14 Quality: Good	**G1:** 51.4 ± 11.8 **G2:** 50.9 ± 16.3 NR	**G1:** Speech language therapists, parent **G2:** Routine care as provided in community—speech pathologists, behavior analyst **G1:** Clinic, home **G2:** Community	**G1:** Yes **G2:** NR	**G1:** Suggested 30 minutes/day parent training, parents received monthly training for 6 months followed by training ~2 months for 6 months, intervention focused on facilitating communication via parental sensitivity and responsiveness, adapted communication strategies, consolidation, elaboration + routine care **G2:** Intensity NR, routine care including speech	• G1 showed improvements in ADOS scores, social interaction, expressive language, child communication acts during interaction • No adaptive behavior differences or differences in parenting stress between groups • Language gains particularly prominent in younger, lower functioning children • Increased parental synchrony (communication which maintained vs. redirected or controlled child responses) in G1 associated with reduction in child ADOS

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				pathology, ABA-based treatment	score (decreased impairment, p=.014); reduction in synchrony for G2 and small increase in mean ADOS scores • In tests of mediation, change in parental synchrony accounted for 34% of total treatment effect on ADOS outcome
Keen et al. 2010[27] Australia **G1:** Professional parent intervention, 17 families/NR **G2:** Self-directed video based parent intervention, 22 families/NR Quality: Good	**G1:** 36.38 ± 7.54 **G2:** 35.71 ± 6.92 **G1:** 53.06 ± 9.06 **G2:** 52.86 ± 6.53	**G1**: Doctoral students (facilitator) **G2**: DVD-led curriculum **G1**: Workshop / home **G2**: Home	**G1**:NR **G2**:NR	**G1**: 2-day parent group workshop and a series of 10 home-based consultations 10 X 1 hour home-visits which occurred twice-weekly over 5–6 weeks, focused on parental stress, child communication **G2**: Self-directed parent intervention group received an interactive instructional DVD "Being Responsive: You and Your Child with Autism" lasting for 6 weeks, focused on parental stress, child communication	• G1 showed significantly greater improvement on social communication at follow-up than G2 regardless of values at baseline • Parents low in self-efficacy at baseline demonstrated relatively higher levels of self-efficacy if they received G1 vs. G2 • G1 reduced child-related stress relative to G2 for both mothers and fathers • Fathers reported higher levels of stress than mothers in both groups • Behavior sample scores at follow-up not affected by group condition • All outcomes are based on parent report
Casenhiser et al. 2013[28] **G1:** MEHRIT (developmental individualized relationship-based intervention), 25/25 **G2:** Community-based treatment, 26/26	**G1:** 42.5 ± 8.8 (mo.) **G2:** 46.4 ± 8.3 (mo.) NR	**G1:** Speech-language pathologists, occupational therapists **G2:** Varied community-based	**G1:** Yes **G2:** NR	**G1:** 2 hours/week therapist training+3 hours parent interaction for 12 months; intervention focused on social interaction, communication, parental responsiveness,	• At pretreatment, G2 had higher scores on investigator-rated "enjoyment in interaction" domain of the modified Child Behavior Rating Scale; at followup, G1 improved significantly more compared with G2 on the domains of attention to activity, involvement, initiation of joint attention, and enjoyment in

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Quality: Fair		therapists **G1:** NR **G2:** Community-based		sensory-motor skills **G2:** Mean 3.9 hours treatment/week; treatment included speech therapy, ABA-based approaches, occupational therapy, social skills training, and specialized day care	interaction (p values <.05, effect sizes 0.63-1.02); no significant difference in compliance domain • Both groups improved from baseline to followup on language developmental quotient measure but no significant between group difference • Greater baseline language skills, initiation of joint attention, and involvement were significant predictors of language change
Rogers et al. 2012[29, 30] US **G1**: Parent-delivered Early Start Denver mode (ESDM), 49/49 **G2**: Community treatment as usual, 49/49 Quality: Fair	**G1:** 21.02 ± 3.51 **G2:** 20.94 ± 3.42 **G1:** 64.88 ± 17.22 **G2:** 63.08 ± 15.93	**G1:** Credentialed therapists trained in ESDM methodology **G2:**Community-based interventionists **G1:** University clinics 60-minute session weekly for 12 weeks **G2:** Interventions available in community	**G1:** Yes **G2:** NR	**G1:** 60-minute session weekly/12 weeks, ESDM intervention using parent training in increasing child attention and motivation; sensory social routines; engagement and joint activity; nonverbal communication; imitation skills; joint attention; speech development; using antecedent-behavior-consequence relationships; prompting, shaping, and fading techniques; conducting functional assessments to develop new interventions **G2:** Community interventions as selected by parents	• At followup, G1 received mean 1.48 hours treatment/week G2 received 3.68 (p<.05) • G2 had more severe social affect symptoms at baseline, poorer imitation and nonsocial orienting scores compared with G1 (p<.05) • No significant group differences on ADOS scores or measures of development at followup • Measures of parent acquisition of parent-child interaction skills did not differ between groups at followup • Social orienting and imitation skills were not found to be moderators of outcomes; increased hours of intervention and younger child age were significantly associated with improved developmental and vocabulary scores in a pooled analysis (p≤.05). In analyses by group, age and hours of intervention associated with improvements in vocabulary for G1 (p≤.05) • Parent stress decreased in G1 compared with G2 (p<.05)

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Pajareya et al. 2011[31] Thailand **G1:** DIR/Floortime,16/15 **G2:** Usual care, 16/16 Quality: Fair	**G1:** 56.6 ± 10.1 **G2:** 51.5 ± 13.9 NR	**G1:** Clinician trained in rehabilitation medicine **G2:** NR **G1:** Parents (attended one day training workshop, received 3-hour DVD lecture, and had two one-hour home visits with a trainer) **G2:** Community-based interventions	**G1:** Yes **G2:** NR	**G1:** Parent-administered DIR/Floortime for an average of 15.2 hours/week for 3 months. Intervention focused on following child's cues related to communication and engagement **G2:** 3 months of usual care interventions	• G1 improved significantly on the Functional Emotional Assessment Scale compared with G2 (p=.045) • CARS scores decreased (improved) for G1 vs. G2 (mean change 2.9 vs. 0.8, p=.004) • G1 scores on parent-rated measure of emotional development significantly improved compared with G2 (mean change 7.7 vs. 0.8, p=.007)
Carter et al. 2011 [32] US **G1**: More than Words, 32/29 **G2**: Control, 30/26 Quality: Fair	**G1:** 21.11 ± 2.71 **G2**: 21.51 ± 2.82 **G1**& **G2**: NR	**G1**+**G2**: Speech / language therapist **G1**+**G2**: Clinic , Home	**G1**:Yes **G2**:NR	**G1**: 8 group sessions with parents only and 3 in-home individualized parent –child sessions over 3.5 months, focused on enhancing parental responsivity and child communication **G2**: No treatment /treatment as usual	• No treatment effect on parental responsivity • G1 showed differential effects on child communication depending on a baseline child factor • Children with lower levels of baseline object interest exhibited facilitated growth in communication • Children with higher levels of object interest exhibited growth attenuation

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Oosterling et al. 2010[33] **G1:** Nonintensive parent training+specialized preschool, 40/36 **G2:** Specialized preschool, 35/31 Quality: Fair	**G1:** 35.2 ± 5.5 **G2:** 33.3 ± 6.4 **G1:** 58.4 ± 16.8 **G2:** 58.0 ± 16.9	**G1:** Parents **G2:** Preschool teachers **G1:** Home **G2:** Preschool	**G1:** NR **G2:** NA	**G1:** Parents received 4 two-hour training sessions plus 3 hour home visits every 6 weeks for 12 months focusing on promoting joint attention and language skills; children also received standard preschool care as noted below (mean 5.2 periods in preschool/day, mean 70.9 ± 131.2 minutes of therapies in preschool/week) **G2:** Specialized daycare or medical nursery for children with developmental issues; both provide individualized speech, motor, music, and play therapy with variable levels of parental support (mean 4.2 periods in preschool/day, mean 76.4 ± 112.8 minutes of therapies in preschool/week)	• No between group differences on language development after 12 months of intervention, though language skills within groups improved over time • No differences in CGI-Improvement scores (G1: 57% much improved, G2: 52% much improved) • No significant effects on parenting skills in either group; engagement, early social communication precursors, parental skills not found to be mediators of effects. DQ not a significant moderator

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Reed et al. 2012[34] UK **G1:** ABA, 14 **G2:** Special nursery, 21 **G3:** Portage, 18 **G4:** Local authority-developed parent training, 13 Quality: Fair	**G1:** 39.0 ± 6.9 **G2:** 41.5 ± 4.0 **G3:** 39.5 ± 6.3 **G4:** 40.2 ± 6.3 **G1:** 55.1 ± 17.3 **G2:** 52.2 ± 17.1 **G3:** 54.0 ± 15.4 **G4:** 51.7 ± 14.5	**G1:** Board certified behavior analysts or Complete Application of Behavior Analysis to Schools-trained individuals, trained tutors **G2:** Post-graduate special education teachers, learning support assistants **G3:** Graduate level Portage supervisor **G4:** Educational psychologist, trained teaching assistants **G1:** Home **G2:** Preschool **G3:** Home **G4:** Home	**G1:** Yes **G2:** Yes **G3:** Yes **G4:** NR	**G1:** Mean 30.4 hours/week for 9 months, 1:1 discrete trial based intervention **G2:** Mean 12.7 hours/week for 9 months, group-based intervention focused on social, motor, and other skills, some TEACCH elements **G3:** Mean 8.5 hours/week for 9 months, 1:1 intervention **G4:** Mean 12.6 hours/week for 9 months, 1:1 child training plus parent-delivered intervention	• Scores on cognitive and adaptive measures were not significantly different among groups • Scores on British Abilities Scale improved for G1 vs. G2-G4 ($p<.05$) • Composite change scores (mean of change scores on cognitive, adaptive, and educational measures) were not statistically significantly different across groups, although G1 vs. G2-G4 and G2 vs. G3-G4 approached significance ($p<.06$) • Composite change scores were inversely related to initial ASD severity for G2-G4 but positively related for G1; the strength of that relationship only differed significantly between G1 and G3 ($p<.05$) • As time in intervention increased, composite scores improved for G2-G4 but worsened for G1 ($p<.05$). No differences were found in the amount of improvement between G2-G4

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months ± SD IQ, Mean ± SD	Intervention Provider Intervention Setting	Intervention Manualized?	Intervention Intensity, Duration, And Focus	Key Outcomes
Reed et al. 2011[35] UK **G1:** Barnet Early Autism Model (BEAM), 16/16 **G2:** Portage Treatment, 16/16 Quality: Poor	**G1:** 43.6 ± 5.8 **G2:** 40.1 ± 8.3 **G1:** 83.3 ± 23.7 **G2:** 72.3 ± 12.5	**G1:** Trained facilitators, speech and occupational therapists, educational psychologist **G2:** Trained Portage facilitators **G1+G2:** Home	**G1:** Yes **G2:** NR	**G1:** Mean 6.4±2.1 hours/week individualized therapy focused on social communication, emotion regulation, transactional support and including TEACCH, PECS, music and speech therapy, communication, sensory integration **G2:** 8.5±6.8 hours/week delivered by parents and focused on communication, skill building based on Floortime model	• Significant gains from baseline to followup for G1 vs. G2 in investigator-and parent-rated measures of adaptive behavior and language (p values<.05) • Greater reduction in parental stress and increase in satisfaction in G1 vs. G2 (p values <.01) • Lower parent stress at baseline correlated with gains in adaptive behavior and language (p values <.05)
Wong et al., 2010[36] China **G1**: Early intervention, 9/9 **G2**: Control, 8/8 Quality: Poor	**G1**: 25.33 ± 6 **G2**: 27.88 ± 5.57 **G1**: 17.85 ± 4.16 **G2**: 17.91 ± 4.49	**G1+G2**: Trained interventionists **G1+G2**: Clinic	**G1**: NR **G2**: NR	**G1**: Ten 30-min sessions for 2 weeks with focus on communication, social interaction, parent stress **G2**: Starting from Week 5 with the same 10-session intervention, with focus on communication, social interaction, parent stress	• No significant group difference on communication, reciprocal social interaction or symbolic play • No between group differences on parent observation on language and relationship to people • No group difference on the total parent stress scores
McConkey et al., 2010[37] UK **G1**: Keyhole EIBI program, 36/35 **G2**: Control, 26/26 Quality: Poor	**G1**: 2.8 years **G2**: 3.4 years NR	**G1+G2**: Early intervention therapists **G1+G2**: Home	**G1**: NR **G2**: NR	**G1**:15–18 home visits over a nine-month period in 2 separate geographical areas, focus on child communication, parental stress **G2**: 5 home visits (n=15) and no additional	• G1 showed significant improvements on different indices of communication than G2 • Mothers improved on measures of health G1 more than G2 but not of stress • higher percentage of parents in G2 reported the children were improving on language and imitation at Time 1 compared to G1 but the percentages were comparable at Time 2

Author, Year, Country Groups, N Enrollment/N Final Study Quality	Age, Mean Months ± SD IQ, Mean ± SD	Intervention Provider Intervention Setting	Intervention Manualized?	Intervention Intensity, Duration, And Focus	Key Outcomes
				services or supports (n=11), focus on child communication, parent stress	• Only parents in G1 reported significant improvements from Time 1 to Time 2 on language, imitation and relating to others • Both groups improved on ratings of improvements in play • On all the Vineland measures, the standard deviations rose markedly at Time 2 for children in G1 but not for G2

ABA-applied behavior analysis; AEPS- assessment evaluation and programming system for infants and children; ADOS- autism diagnostic observation schedule; ASD- autism spectrum disorder; CARS-Childhood Autism Rating Scale; CI-confidence interval; DIR- Developmental, Individual Difference, Relationship-based (DIR®) Model; DTT- discrete trial training; DQ- developmental quotient; EEG- electroencephalogram; EIBI- early intensive behavioral intervention; ESDM- Early Start Denver Model; Z-group; IJA- initiation of joint attention; LEAP- learning experiences and alternate program for preschoolers and their parents; N-number; NR-not reported; SD-standard deviation; SEI- socially engaged imitation; SPA- shares positive affect; PECS- picture exchange communication system; PDD-NOS-Pervasive Developmental Disorder-Not Otherwise Specified; TEACCH- treatment and education of autistic and related communication-handicapped children

References

1. Peters-Scheffer N, Didden R, Mulders M, et al. Effectiveness of low intensity behavioral treatment for children with autism spectrum disorder and intellectual disability. Research in Autism Spectrum Disorders 2013;7(9):1012-25.
2. Peters-Scheffer N, Didden R, Mulders M, et al. Low intensity behavioral treatment supplementing preschool services for young children with autism spectrum disorders and severe to mild intellectual disability. Res Dev Disabil 2010 Nov-Dec;31(6):1678-84. PMID: 20627451.
3. Itzchak EB, Zachor DA. Who Benefits from Early Intervention in Autism Spectrum Disorders? Research in Autism Spectrum Disorders 2011;5(1):345-50.
4. Zachor DA, Itzchak EB. Treatment Approach, Autism Severity and Intervention Outcomes in Young Children. Research in Autism Spectrum Disorders 2010;4(3):425-32. PMID: 742864417; EJ878590.
5. Strain PS, Bovey EH. Randomized, Controlled Trial of the Leap Model of Early Intervention for Young Children with Autism Spectrum Disorders. Topics in Early Childhood Special Education 2011;31(3):133-54.
6. Eldevik S, Hastings RP, Jahr E, et al. Outcomes of behavioral intervention for children with autism in mainstream pre-school settings. J Autism Dev Disord 2012 Feb;42(2):210-20. PMID: 21472360.
7. Eikeseth S, Klintwall L, Jahr E, et al. Outcome for Children with Autism Receiving Early and Intensive Behavioral Intervention in Mainstream Preschool and Kindergarten Settings. Research in Autism Spectrum Disorders 2012;6(2):829-35.
8. Flanagan HE, Perry A, Freeman NL. Effectiveness of large-scale community-based intensive Behavioral Intervention: A waitlist comparison study exploring outcomes and predictors. Research in Autism Spectrum Disorders 2012;6(2):673-82.
9. Freeman N, Perry A. Outcomes of intensive behavioural intervention in the Toronto Preschool Autism Service. Journal on Developmental Disabilities 2010;16(2):17-32.
10. Shine R, Perry A. The relationship between parental stress and intervention outcome of children with autism. Journal on Developmental Disabilities 2010;16(2):64-6.
11. Perry A, Cummings A, Geier JD, et al. Predictors of Outcome for Children Receiving Intensive Behavioral Intervention in a Large, Community-Based Program. Research in Autism Spectrum Disorders 2011;5(1):592-603.
12. Perry A, Blacklock K, Dunn Geier J. The relative importance of age and IQ as predictors of outcomes in Intensive Behavioral Intervention. Research in Autism Spectrum Disorders 2013;7(9):1142-50.
13. Perry A, Cummings A, Geier JD, et al. Effectiveness of Intensive Behavioral Intervention in a Large, Community-Based Program. Research in Autism Spectrum Disorders 2008 Oct;2(4):621-42.
14. Boyd BA, Hume K, McBee MT, et al. Comparative Efficacy of LEAP, TEACCH and Non-Model-Specific Special Education Programs for Preschoolers with Autism Spectrum Disorders. J Autism Dev Disord 2013 Jun 28. PMID: 23812661.
15. Kovshoff H, Hastings RP, Remington B. Two-year outcomes for children with autism after the cessation of early intensive behavioral intervention. Behav Modif 2011 Sep;35(5):427-50. PMID: 21586502.
16. Remington B, Hastings RP, Kovshoff H, et al. Early intensive behavioral intervention: outcomes for children with autism and their parents after two years. Am J Ment Retard 2007 Nov;112(6):418-38. PMID: 17963434.
17. Schreibman L, Stahmer AC. A Randomized Trial Comparison of the Effects of Verbal and Pictorial Naturalistic Communication Strategies on Spoken Language for Young Children with Autism. J Autism Dev Disord 2013 Nov 23. PMID: 24272416.
18. Strauss K, Vicari S, Valeri G, et al. Parent inclusion in Early Intensive Behavioral Intervention: the influence of parental stress, parent treatment fidelity and parent-mediated generalization of behavior targets on child outcomes. Res Dev Disabil 2012 Mar-Apr;33(2):688-703. PMID: 22188793.
19. Fava L, Strauss K, Valeri G, et al. The Effectiveness of a Cross-Setting Complementary Staff- and Parent-Mediated Early Intensive Behavioral Intervention for Young Children with ASD. Research in Autism Spectrum Disorders 2011;5(4):1479-92.
20. Landa RJ, Holman KC, O'Neill AH, et al. Intervention targeting development of socially synchronous engagement in toddlers with autism spectrum disorder: a randomized controlled trial. J Child Psychol Psychiatry 2011 Jan;52(1):13-21. PMID: 21126245.
21. Landa RJ, Kalb LG. Long-term outcomes of toddlers with autism spectrum disorders exposed to short-term intervention. Pediatrics 2012 Nov;130 Suppl 2:S186-90. PMID: 23118250.
22. Dawson G, Jones EJ, Merkle K, et al. Early behavioral intervention is associated with normalized brain activity in young children with autism. J Am Acad Child Adolesc Psychiatry 2012 Nov;51(11):1150-9. PMID: 23101741.

23. Dawson G, Rogers S, Munson J, et al. Randomized, Controlled Trial of an Intervention for Toddlers With Autism: The Early Start Denver Model. Pediatrics 2010 January 2010.
24. Roberts J, Williams K, Carter M, et al. A Randomised Controlled Trial of Two Early Intervention Programs for Young Children with Autism: Centre-Based with Parent Program and Home-Based. Research in Autism Spectrum Disorders 2011;5(4):1553-66.
25. Aldred C, Green J, Adams C. A new social communication intervention for children with autism: pilot randomised controlled treatment study suggesting effectiveness. J Child Psychol Psychiatry 2004 Nov;45(8):1420-30. PMID: 15482502.
26. Aldred C, Green J, Emsley R, et al. Mediation of treatment effect in a communication intervention for pre-school children with autism. Journal of Autism and Developmental Disorders 2012;42(3):447-54.
27. Keen D, Couzens D, Muspratt S, et al. The effects of a parent-focused intervention for children with a recent diagnosis of autism spectrum disorder on parenting stress and competence. Research in Autism Spectrum Disorders 2010;4(2):229-41.
28. Casenhiser DM, Shanker SG, Stieben J. Learning through interaction in children with autism: preliminary data from asocial-communication-based intervention. Autism 2013 Mar;17(2):220-41. PMID: 21949005.
29. Rogers SJ, Estes A, Lord C, et al. Effects of a brief Early Start Denver Model (ESDM)–based parent intervention on toddlers at risk for autism spectrum disorders: A randomized controlled trial. Journal of the American Academy of Child & Adolescent Psychiatry 2012;51(10):1052-65.
30. Estes A, Vismara L, Mercado C, et al. The Impact of Parent-Delivered Intervention on Parents of Very Young Children with Autism. J Autism Dev Disord 2013 Jul 10PMID: 23838727.
31. Pajareya K, Nopmaneejumruslers K. A pilot randomized controlled trial of DIR/Floortime parent training intervention for pre-school children with autistic spectrum disorders. Autism 2011 Sep;15(5):563-77. PMID: 21690083.
32. Carter AS, Messinger DS, Stone WL, et al. A randomized controlled trial of Hanen's 'More Than Words' in toddlers with early autism symptoms. J Child Psychol Psychiatry 2011 Jul;52(7):741-52. PMID: 21418212.
33. Oosterling I, Visser J, Swinkels S, et al. Randomized controlled trial of the focus parent training for toddlers with autism: 1-year outcome. J Autism Dev Disord 2010 Dec;40(12):1447-58. PMID: 20440639.
34. Reed P, Osborne L. Impact of Severity of Autism and Intervention Time-Input on Child Outcomes: Comparison across Several Early Interventions. British Journal of Special Education 2012;39(3):130-6.
35. Reed P, Osborne LA, Makrygianni M, et al. Evaluation of the Barnet Early Autism Model (BEAM) Teaching Intervention Programme in a "Real World" Setting. Research in Autism Spectrum Disorders 2013 June 2013;7(6):631-8.
36. Wong VCN, Kwan QK. Randomized controlled trial for early intervention for autism: A pilot study of the Autism 1-2-3 project. Journal of Autism and Developmental Disorders 2010;40(6):677-88.
37. McConkey R, Truesdale-Kennedy M, Crawford H, et al. Preschoolers with Autism Spectrum Disorders: Evaluating the Impact of a Home-Based Intervention to Promote Their Communication. Early Child Development and Care 2010;180(3):299-315.

Appendix G. Applicability Tables

Table G-1. Applicability of early intensive behavioral and developmental intervention studies

Domain	Description of applicability of evidence
Population	Studies included both toddlers and preschool children (i.e., children from 2-5 years; range of mean ages: 20.94 – 55.7 months). Baseline cognitive, language, and adaptive scores typically fell within the impaired range, reflecting characteristics of young children with ASD in the community. Most participants were male. Where reported, other population demographic characteristics were mixed regarding race, ethnicity, language spoken, parental education level, and socioeconomic status.
Intervention	Interventions included early intensive behavioral intervention without (EIBI) and with (Parent training) large parent training components. Approaches ranged in terms of manualization, techniques (e.g., DIR vs. TEACCH), provider, setting (i.e., school vs. home; individual vs. group), frequency, and intensity. 14/25 studies provided at least 6 months of treatment and 11/25 provided at least a year.
Comparators	Comparators included eclectic interventions, “treatment as usual” in the community, lower levels of manualized treatments, providing manuals with no additional training/support, special education preschool curricula, DVD-based parent training, and parent support. As in the intervention groups, comparators varied by setting, provider, frequency, and intensity, all of which were inconsistently documented.
Outcomes	Studies commonly assessed IQ, language, autism severity, and adaptive behavior outcomes after anywhere from 2 weeks to 2 years of intervention. Many studies found that both groups improved in IQ, adaptive behavior, and language/communication skills. Others found differential treatment effects. Because most studies compared one treatment to another without controlling for frequency or intensity, it is not always clear whether improvement is due to receiving any treatment vs. specific treatment modalities. Some evidence emerged that baseline age, autism severity, language, and cognitive skills interacted with specific treatment types to predict differential outcomes.
Setting	Studies took place in home, clinic, and school settings in the United States, Canada, Israel, China, Sweden, Italy, Norway, the Netherlands, Australia, Thailand, and the United Kingdom. Participants were assigned to treatment groups in a variety of ways including random assignment, parental preference, educational system and governmental decisions, geographical location, and availability of services.

Table G-2. Applicability of social skills studies

Domain	Description of applicability of evidence
Population	Studies typically included school-aged children (i.e. children from 4-13), typically male, diagnosed with high-functioning autism, with baseline cognitive scores typically within the average range, even though some studies also included children and classified them as high-functioning as long as they met an IQ score cutoff of 70 or above. The populations studied generally only reflect the IQ and language characteristics of school-aged children with ASD without concomitant cognitive and/or language deficits in the community.
Intervention	Social skills interventions varied widely in terms of scope and intensity. Examples included a few studies that replicated interventions using the manualized Skillstreaming model; a few studies that incorporated peer-mediated and/or group-based approaches; and interventions that focused on emotion identification and theory of mind training. One study examined long-term follow-up of the Children's Friendship Training program and another study was a Japanese pilot study of the Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH) model. The studies also varied in intensity, with the majority of the studies consisting of 1-2 hour sessions/week lasting for approximately 4-5 weeks; however, some of the group-based approaches lasted for 15-16 weeks.
Comparators	Comparators were varied but the majority of studies included a wait-list control group. Other comparative interventions included revised or updated versions of previously utilized interventions or variations of group makeup (i.e. peer group only versus peer group with a sibling; child-directed group interaction or peer-directed group interaction).
Outcomes	Studies varied widely in their assessment of outcome measures. Several studies measured learning of new skills specific to the treatment (i.e. Skillstreaming Knowledge Assessment). Several studies utilized parent-report of social skills, including scores on the Social Responsiveness Scale, the Social Skills Rating System, and the BASC-2. Other studies utilized behavioral ratings by staff and/or teachers on the child's social interactions and social network salience. Finally, some studies examined emotion identification or theory of mind measures. All of the studies were short-term in nature, with follow-up occurring approximately 2-3 months post-intervention, if follow-up was done at all. The results indicated that most studies reported short-term gains in social skills and emotion recognition as reported by parents or within study measures. However, maintenance and generalization of these skills beyond the treatment context had variable results.
Setting	Studies were conducted in the US, Australia, Japan, and Europe (The Netherlands) in primarily clinic settings, even though a few group-based interventions were utilized in the school/community setting, and the emotion-identification interventions utilizing media were implemented in the home setting.

Table G-3. Applicability of studies of interventions addressing conditions commonly associated with ASD

Domain	Description of applicability of evidence
Population	Studies included children ages 4-16 with ADOS-confirmed ASD diagnosis and often with primary anxiety diagnosis. Most studies required IQ greater than 70 with children falling in the average range. Children were recruited from a range of sources including outpatient psychiatry clinics, schools, pediatrician's offices, parent and family support groups, university medical clinics and research centers. Children were mostly male, and primarily Caucasian in studies conducted within the US.
Intervention	Interventions consisted of cognitive behavioral therapy (CBT) typically provided on a weekly basis for 60-90 minutes over a period of four months although treat although treatment times ranged from 7 to 32 weeks. Interventions were typically manualized and included both children and parents. One study did not examine CBT rather examined parent training as an augmentation to risperidone.
Comparators	Most studies compared CBT to either wait list or treatment as usual controls, and two studies compared CBT to social skills therapies The study examining parent training augmentation compared participants on risperidone with parent training to those on risperidone without parent training.
Outcomes	Studies primarily targeted anxiety symptoms therefore the outcome measures included various measures of anxiety both at end of intervention and at a follow-up interval of 3 months to one year following termination of intervention. Measures of anxiety most commonly included the Anxiety Disorders Interview Schedule, the Spence Children's Anxiety Scale, the Multidimensional Anxiety Scale for Children and the Clinical Global Impressions-Severity Scale. Several studies additionally measured improvements in adaptive behavior measured by the Vineland Adaptive Behavior Scale as an outcome, and, one study measured improvements in executive functioning and one study measured improvements in emotion regulation as the primary outcome. The study assessing utilization of parent training augmentation of risperidone examined outcomes including irritability, maladaptive behaviors, socialization and communication.
Setting	Studies were primarily conducted in the US with one study conducted in Singapore. Interventions typically occurred in outpatient treatment centers and in the participants' homes.

Table G-4. Applicability of studies evaluating play/interaction-based interventions

Domain	Description of applicability of evidence
Population	Studies included children between 21 and 75 months of age with confirmed ASD diagnoses. The majority of children were male and were generally recruited from populations of children already receiving intervention in early intervention settings, preschools, or specialty schools. Children in studies were representative of the larger population of children with ASD in early intervention programs.
Intervention	Interventions used approaches focusing on joint attention, with most joint attention interventions using elements of Kasari's 2006 model; play skills/pretend play with a typically developing peer model; imitation; and parental responsivity. On study modified the Hanen More than Words approach. Intervention was mediated by parents/caregivers, teachers, and interventionists.
Comparators	Comparators included early intervention without additional joint attention or interaction training or no specific intervention.
Outcomes	Targeted outcomes included joint attention and engagement, imitation, language, play skills, and social skills.
Setting	Studies were conducted in mainstream and ASD-specific preschools, specialty schools, mainstream public schools, and research centers in the US, Belgium, and Norway.

Table G-5. Applicability of studies evaluating other behavioral approaches

Domain	Description of applicability of evidence
Population	Studies of neurofeedback included children between the ages of 8-12 years and had IQs in the average range (>70); children were recruited from a special education school and from the community. Studies of sleep interventions included children between 2 and 10 years of age. Participants were drawn from the Autism Treatment Network and from children attending a pediatrics and psychiatry clinic. Participants were generally reflective of the larger population of children with ASD and sleep issues. One study included young children (36-104 months) who may have issues with feeding/mealtime.
Intervention	Interventions included neurofeedback training, a sleep education pamphlet, and CBT with and without melatonin, parent education in sleep hygiene and in promoting appropriate mealtime behaviors.
Comparators	Comparators included no treatment/waiting list, group vs. individual training, and in one sleep study, melatonin alone, CBT+melatonin, or placebo.
Outcomes	Outcomes in neurofeedback studies included measures of executive function and social and communication skills. Sleep studies assessed sleep parameters including night wakings, time to fall asleep, sleep duration, and sleep anxiety. The feeding study assessed mealtime behaviors such as food acceptance.
Setting	Studies were set in the home and treatment centers in the US, the Netherlands, and Italy.