Critical Review:
In individuals with autism spectrum disorder (ASD), which particular social skills
treatment approach is most effective in a group setting?

Carrie McGregor
M.Cl.Sc. (SLP) Candidate
University of Western Ontario: School of Communication Sciences and Disorders

This critical review evaluates and compares five social skills treatment approaches used in a group setting for those with autism spectrum disorder (ASD): modeling and reinforcement, peer-mediated interventions, reinforcement schedules and activities, scripts and social stories and miscellaneous. Study designs include: 1 case control, 1 single group pre-/post-test, 1 multiple baseline across subjects, 1 multiple baseline across skills with a counterbalanced reversal, 1 case study and 2 randomized block research designs. Results confirm that group instruction is an appealing and effective service provision option for SLPs treating social skills deficits in those children along the autism spectrum. All of the five approaches were effective in eliciting some change in the social functioning of the children with ASD, however, no conclusion could be made regarding which approach was most effective due to the vast differences in research design, variables measured, and tools used to measure progress.

Introduction

Autism spectrum disorder (ASD) has three core features: difficulty with social interaction, impairments in verbal and nonverbal communication, and restrictive and repetitive patterns of behaviour (American Psychiatric Association, 1994 as cited in Wetherby & Prizant, 2000). Social skills deficits can sometimes be overlooked in the speech and language therapy process while verbal and nonverbal communication deficits tend to receive more attention. However, social skills deficits are a debilitating result of this disorder; these children have significant difficulty within their peer groups and are often without friends. These difficulties tend to get worse as children mature into adolescence and adulthood. Therefore, treatment aimed at this area is of the upmost importance for this population. As Matson (1994) found, "poor social skills are a key variable in determining outcomes for this group" (as cited in MacKay, Knott & Dunlop, 2007). Matson, Matson and Rivet (2007) completed a review of the literature on social skills treatment for individuals within the ASD spectrum. They organized the 79 studies' treatment approaches into 5 categories: modeling and reinforcement, peer-mediated interventions, reinforcement schedules and activities, scripts and social stories, and miscellaneous (e.g., social skills curriculum, Picture Exchange Communication System etc.). Although all of the treatment approaches utilized in the literature reviewed were found to lead to considerable gains in social skills for those with ASD, modeling and reinforcement were the most popular social skills treatment employed. Lastly, Matson et. al. (2007) suggested a need for group research designs within this area. From this review it was determined that a review of these five categories of treatment approaches applied to the group setting would be a valuable addition to the literature in this field. Social skills are a particularly difficult area to treat within our field, and any efforts to utilize more natural environments, settings, and participants (e.g., group therapy) could potentially contribute to more effective and efficient service provision.

Objectives

The objective of this paper is to critically evaluate and compare five social skills treatment approaches used in a group setting for those with ASD, and determine which approach(es) are most effective with individuals with ASD.

Methods

Search Strategy
Computerized databases PsycINFO and ProQuest Education Journals were searched using the following strategy:

> ((Social skills) OR (Social Learning) OR (pragmatics)) AND ((Therapy) OR (Treatment)) AND ((ASD) OR (Autism) OR (Aspergers))

The search was limited to peer-reviewed journals in English. Reference lists of articles identified through the search strategy were searched for further relevant publications.

Selection Criteria
Studies selected for inclusion in this critical review paper were required to investigate the use of one of five social skills treatment approaches with children with ASD: modeling and reinforcement, peer mediation,

reinforcement schedules and activities, scripts and social stories, or miscellaneous approaches within a group setting. No limits were set on the demographics of the research participants.

Data Collection
Results of the literature search yielded the following 7 studies matching the previously chosen selection criteria: 1 case control, 1 single group pre-/post-test, 1 multiple baseline across subjects, 1 multiple baseline across skills with a counterbalanced reversal, 1 case study and 2 randomized block research designs.

Results

Modeling and Reinforcement

Kroeger, Schultz, and Newsom (2007) utilized a case control study design with direct video modeling group instruction as the treatment condition and a free play group as the control condition. Twenty five children, boys and girls 4-6 years of age with an autism diagnosis were assigned to groups. Group assignment was based on parent preference of time slots and then matched based on level of functioning using the *Gilliam Autism Rating Scale (GARS)* and t-tests to ensure group equality.

Pre-test and post-test data were collected for each of the participants at the first and last session using the *Social Interaction Observation Code (SIOC)* and the *Assessment of Basic Language and Learning Skills (ABLLS)*. The *SIOC* was used to measure frequency, duration and nature of social interactions (specifically initiating, responding and interacting behaviours) during unstructured play with no prompting or reinforcement from adults. This information was obtained from video footage of the first and last sessions. Raters were two psychology graduate students blinded to the study. Interrater reliability was 98.4% using an exact agreement formula. The *ABLLS* is a criterion-referenced skills test. The researchers used the group instruction subtest to measure learning readiness and group orienting behaviours. This information was obtained from data gathered during the first and last sessions "hello" and "goodbye" circle time activities (i.e., small group learning activity). Group facilitators conducted the *ABLLS* assessments on the children. Different facilitators rated pre and post intervention to try to eliminate biases. Cronbach's alpha resulted in 0.912 indicating that group facilitators were internally consistent using the *ABLLS*.

Intervention consisted of a "hello" circle time, playtime and a "goodbye" circle time for both groups; however the direct video modeling group had half playtime and half video instruction and also they were prompted during play and reinforced for appropriate social behaviour. The video consisted of 2-5 year old typical children modeling skills, then a time delay to allow the children with autism to imitate the skills and reinforcement cartoon breaks intermittently throughout the video. The videos for the five weeks of the study focused on different socialization skills (e.g., joint play and pretend play).

Data collected using the *SIOC* and the *ABLLS* were analyzed utilizing a multivariate analysis of variance for repeated measures using the General Linear Model statistic. Results from the *SIOC* showed both groups improved in their prosocial behaviours (initiating, responding and interacting) from pre- to post-intervention measures. However, the direct video modeling group consistently made more gains in the social skills measured than the free play group. Further, all improvements were statistically significant ($p<0.05$) and had large effect sizes (>0.14). Results from the *ABLLS* showed both groups improved their learning readiness and group orienting behaviours over the course of the intervention (statistically significant $p<0.05$). However, there were no statistical differences between improvements in the direct video modeling group and the free play group.

A parent satisfaction rating scale was given at the end of the study to test for social validity. The parents were equally and generally satisfied with the results of the intervention. Although no data verification was provided, parents reported improvements in social-communicative language.

Overall, these results suggest that video modeling in a group setting is a possible treatment option for improving social skills in children with autism. This level II research study led to some meaningful changes in the social skills of the children involved, which were verified with social validity testing (i.e., parent satisfaction rating scale). However, these results need to be interpreted with caution since the researchers could not show a statistical difference between the control group and the treatment group for all measures tested.

Lim, Kattapuram and Lian (2007) utilized a single group pre-/post-test design. Ten children, all boys 5-7 years of age with an autism diagnosis (8) or a language delay (2) were assigned to two groups.

Pre-test and post-test quantitative data were taken for each participant before the first session and during the last session using the Observation Profile from the *Asperger's Syndrome: a Practical Guide for Teachers* manual; this information was rated by the parents. The

researchers also gathered qualitative data with two questionnaires they developed: the *Child Portfolio* and the *Parent Perception Form*. The *Child Portfolio* was given before the sessions began to ask the parents for three problem areas to work on in therapy. The *Parent Perception Form* was given after the sessions were complete to provide parents with an opportunity to discuss specific improvements in their child's social skills. Before the sessions began the parents attended a 1-hour workshop presented by the researchers to discuss their child's social skills deficits, some ways to improve them, and also inform them on how the 8-week sessions would run.

The intervention targeted eight specific social skills areas over the 8-weeks (e.g., making friends and emotions). Behavioural and cognitive strategies (e.g., modeling and reinforcement) were utilized throughout the sessions to improve social skills in all of the children, and the children were given homework after each session to allow the parents opportunities to practice skills learned at home. Quantitative data collected using the Observation Profile from the *Asperger's Syndrome: a Practical Guide for Teachers* manual was analyzed using descriptive and non-parametric statistics. The researchers found reductions in social interaction, social imagination, social communication, and motor and organizational skills as well as the overall social skills score suggesting improvement since lower scores are positive. Although the Wilcoxon Signed Rank Test was used to measure the pre- to post- test differences, the sample was too small to yield any significant differences or a reliable conclusion.

Qualitative data collected using the *Parent Perception Form* were reviewed for trends. The following trends were found: 100% reported 2 or more aspects of social skills improved, 90% were able to provide an example at home or school of an improvement in social skills, and 90% were able to list knowledge they had gained that could help their child's social skills.

Overall, these results suggest that modeling and reinforcement of social skills in a group setting is a possible treatment option for professionals to choose from. This level II research study led to some suggestive results which were confirmed with social validity testing (i.e., *Parent Perception Form*). However, these results should be interpreted with caution due to the possible reporting bias in the quantitative data collected from parents (i.e., Observation Profile from the *Asperger's Syndrome: a Practical Guide for Teachers* manual) and the fact that no statistical significance was found.

Peer-Mediated Interventions

Kamps, Leonard, Vernon, Dugan, Delquadri, Gershon, Wade and Folk (1992) utilized a multiple baseline across subjects design. Three children, all males 7 years 5 months to 7 years 9 months of age all with a diagnosis of autism, were targeted for intervention in their fully integrated grade one classroom. The first grade classroom consisted of 11 non-handicapped peers, 3 students with autism, and 2 students with physical disabilities.

The *Social Interaction Code* was used to measure the frequency of, time engaged in, and duration of social interactions during the intervention (i.e., play groups). The researchers also utilized a 21-item social skills rating scale to measure appropriate social behaviour during the play groups. Researchers measured inter-observer agreement for all data collected; the *Social Interaction Code* average was 80.6%-87.5%, while the 21-item social skills rating scale average was 73%.

The baseline condition consisted of 20 minute play sessions four times a week for 2-6 weeks within a play group. Each play group consisted of 3 non-handicapped peers and one child with autism. Children were asked to stay in the groups and follow directions with no direct prompting given regarding appropriate social behaviour. The intervention consisted of social skills training (e.g., including others in activities) within the first 10 minutes of the 20 minute play groups, four times a week. Training lasted 2-3 weeks for each skill. The children with autism were given a feedback session during free play after all of the social skills training was complete and were reinforced with stickers for appropriate social behaviour. A follow-up session was conducted one month after the last feedback session. The children were reminded of appropriate social behaviour and given positive feedback.

Results of the *Social Interaction Code* showed improvements in the frequency of, time engaged in, and duration of social interactions for all three students with autism. Ratings using the 21-item social skills rating scale also improved over the course of the intervention. Data was also collected periodically for typically developing peers and the researchers found improvements in their social behaviour as well. Interestingly the researchers found that the responsivity of the typically developing peers toward the children with autism and vice versa improved during and after the play groups. Results were maintained during the feedback session and follow-up.

Overall, these results indicate that social skills training with peers in a classroom setting may be a possible

treatment option for children with ASD. This level I research study led to some suggestive results. However, it should be noted that the small sample size (3 participants) may not be representative of the heterogeneous ASD population, and the measures utilized were simply tabulations of observations, and not tested for statistical significance.

Morrison, Kamps, Garcia and Parker (2001) utilized a multiple baseline design across skills with a counterbalanced reversal design. Four children, boys and girls 10-13 years of age all with a diagnosis of autism, were targeted for intervention in their schools. There were four intervention groups consisting of one child with autism and two to three non-handicapped peers. The groups met outside the classroom (e.g., conference room) three times a week for 20-30 minutes.

Intervention centered around three core social skills: requesting, commenting, and sharing. The intervention consisted of games and activities being placed in the group (e.g., Ker-Plunk) and the children were asked to play with them together. The groups were also given charts with definitions of the social skills. The children with autism were given reinforcers (e.g., candy and stickers) for appropriate social behaviour.

During the first baseline all games and activities were given to groups with no prompting or instructions except to stay seated and play with the games and activities provided. During the first intervention phase (requesting plus monitoring) all of the games and activities were given to the group again, however this time they were also given a chart for requesting. They were trained for the first 10 minutes of the 20-30 minute sessions about requesting and asked to give examples of requesting using the materials provided. The children were then taught how to monitor these skills. In the self-monitoring groups (2 groups) all children were given a paper and marker and asked to mark down when they displayed requesting and then they would be given a reinforcer. In the peer-monitoring groups (different 2 groups) the peers were given the paper and marker and were rewarded for every time they correctly marked another peer's requesting behaviours. The child with autism, however, did not rate another peer. After this they participated in free play with the games and activities and were given reinforcers for correct usage of the requesting skill. During the second baseline the children were asked not to monitor each other or themselves, they were given games and activities again and were not prompted or reinforced. During the second intervention phase (retraining requesting) the same procedures as the first intervention phase were followed however, the 2 groups who were self-monitoring switched to peer-monitoring and vice versa. Following

this phase the groups switched back to self- or peer-monitoring and the commenting social skill was introduced (commenting plus monitoring). The same procedures were followed as the first intervention phase except that now the students were to use and monitor requesting *and* commenting in themselves and others. Monitoring conditions were alternated for each student again. Following acquisition of the commenting phase the students were introduced to the sharing social skill. All of the procedures were followed again and the monitoring conditions were alternated for each student again.

Data was collected from live and videotaped sessions and were recorded on two separate data sheets. The first sheet tabulated: initiations, responses, social interactions and inappropriate behaviour; the second sheet recorded: requesting, commenting and sharing. Generalization data were also collected during recess and lunch. Inter-observer agreement for these measures across subjects ranged between 90-98%.

Results show an increase in initiations, responses and social interactions for all four children over the course of the intervention. The researchers also found decreases in inappropriate behaviours. Generalization data was promising for only 2 of the 4 participants. Data also showed improvements for all social skills trained including requesting, commenting and sharing. Lastly, there were no differences found for self- vs. peer-monitoring during the sessions.

Overall, these results indicate that peer modeling is a possible treatment option for remediating social skills deficits in children with autism. This level I research study led to some suggestive results. However, these results should be interpreted with caution since the measures utilized were simply tabulations of observations, and not tested for statistical significance. Also, generalizations did not occur for all participants, and the small sample size (4 participants) again may not be representative of the heterogeneous ASD population.

Reinforcement Schedules and Activities

MacKay, Knott and Dunlop (2007) utilized a randomized block design. Forty six children, boys and girls 6-16 years of age with high functioning ASD, were assigned to 6 groups with 7-8 children in each. Groups were not randomly assigned but based on age, geographical location, and availability over the course of the 12-16 weekly meetings. The *Vineland Adaptive Behaviour Scales, Survey Form (VABS)* was used to collect data on the characteristics of the sample. Results of the *VABS* showed that the sample had marked

difficulties in socialization when compared with the general population.

The groups ran for 12-16 weeks and each group met for 1 ½ hours after school. The three key themes: social and emotional perspective-taking, conversation skills and friendship skills were the focus of the group intervention. The groupwork consisted of a review of the timetable, small and large group activities and free play. The researchers also attempted to foster generalization of skills outside the group setting, utilizing community outings, practice of the skills at home and feedback meetings with parents.

Pre-/post-intervention data were collected by neutral assessors who were not involved in the groupwork intervention. Parents were asked to complete *The Spence Social Skills Questionnaire-Parents (SSQ-P)* and *The Spence Social Competence with Peers Questionnaire-Parents (SCPQ-P)* before and after the 12-16 week intervention. Where possible the children were asked to complete *The Spence Social Skills Questionnaire-Pupils (SSQ-PU)* and *The Spence Social Competence with Peers Questionnaire-Pupils (SCPQ-PU)* before and after the intervention. The researchers also gathered 'the three things' from parents before and after the intervention which were the three social skills their child needed to work on the most. This information was gathered from a normed likert scale. Lastly, follow-up interviews were conducted with the parents to probe parent and child perceptions and experiences with the group intervention.

The pre-/post-test data from all four *Spence Questionnaires* and 'the three things' gathered from parent report were compared using paired t-tests; as well the follow-up interviews were examined for common themes. The *Spence Questionnaires* results pre-intervention confirmed the social limitations of the participants as found on the *VABS*. The post-test results from all four questionnaires showed higher scores post intervention which were all statistically significant ($p<0.01$). Effect sizes ranged from medium effects on the questionnaires answered by the children (0.34 & 0.56), to substantial effects on the questionnaires answered by the parents (0.51 & 0.68). 'The three things' gathered from the parents were centered on common social deficits in those with an autism diagnosis (e.g., poor turn-taking skills). The pre-test to post-test results showed a considerable improvement in the ratings given by parents of those three things their child needed to work on most (4.12 to 9.03). The results from the follow-up interviews showed the groups were helpful, particularly evident in changes on 'the three things' rating. Specific changes were noted in their child's social behavior. Parents reported that their children found the experience enjoyable and the only complaint was that the program was too short and should continue in a community centre for their child and other children with an autism diagnosis.

Overall, these results suggest that social skills activities in a group setting are a viable possible option for treatment of those within the autism spectrum. This level II research study led to some meaningful changes in the social skills of the children involved, which were verified with social validity testing (i.e., follow-up parent interview). However, these results should be interpreted with caution due to the possible reporting bias in the data collected from parents and participants themselves.

Scripts and Social Stories

Ruble, Willis and McLaughlin-Crabtree (2008) conducted a case study on outpatient social skills group therapy for children with autism. Six children, all boys 9-12 years of age with a diagnosis of autism, were referred to the clinic in which they participated in the outpatient group. Pre-intervention data was collected using the *Treatment and Research Institute for Autism Spectrum Disorders (TRIAD) Social Skills Assessment (TSSA)*. This criterion based assessment gathers information through parent and teacher report as well as assessment of direct child interactions with the clinician. This measure was used to ensure the children had all of the skills necessary to complete the intervention. As well, parents were asked for their primary concerns about their child. This information was categorized into two main groups of concerns: conversational skills and social problem-solving/flexibility skills. These concerns were used for organizing goals for the intervention groups.

The researchers assessed conversational skills and problem-solving/flexibility skills prior to the intervention as well as following the group treatment. Conversational skills were measured during a 5-minute role-play conversation with the child with autism in which various skills were rated (e.g., how they end a conversation). Inter-rater reliability of this measure was 83%. Problem-solving/flexibility skills were measured through asking questions following a vignette read by the child with autism. Inter-rater reliability of this measure was 97.5%. As well, parents filled out rating scales of social skills use during sessions that they observed. Social validity of this intervention was measured using pre-/post-treatment questionnaires filled out by the parents. Generalization concerns were addressed through homework activities, the parents observing each session, and the parents completing the pre-/post-intervention questionnaire.

Intervention groups met for 75 minutes once a week for 12 weeks. The groups followed a curriculum with skills such as social thinking and starting and ending a conversation. Each skill was taught using four steps: read a social story, sort picture cards of social situations, role-playing, and homework on the skill. The conversational skills were split up into: get attention, ask question/make statement, stay on topic and end conversation.

Results showed improvements in all of the conversational skills except for staying on topic. The problem-solving/flexibility skills were shown to improve with particular improvement in the ability to generate multiple solutions to problems. The parental ratings of social skills use during the intervention were split up into initiating skills, maintenance skills, and responding skills. Improvements were found in 8 out of the 12 skills; particularly skills in the responding group made the most gains (e.g., answer, express interest). Social validity and generalization were measured with parent report following the intervention. All of the qualitative responses were positive and discussed the improvements in conversational and problem-solving/flexibility skills after the intervention group.

Overall, these results suggest that social skills group therapy utilizing social stories may be a viable possible option for treatment of those within the autism spectrum. This level IV research study led to some suggestive results. However, these results should be interpreted with caution due to the possible reporting bias in the data collected from parents, since the measures utilized were simply tabulations of observations, and not tested for statistical significance. As well, yet again the small sample size (6 participants) may not be representative of the heterogeneous ASD population.

Miscellaneous

Epp (2008) utilized a randomized block research design to evaluate results from the SuperKids program. Sixty-six children, boys and girls between primary and secondary school age all with either a diagnosis of autism or a suspected diagnosis, participated in the intervention. The SuperKids program addresses many different social skills within their program (e.g., conversation skills and friendship skills). The program splits up the children into groups of six children of similar age and social communication ability. The SuperKids program utilizes cognitive-behavioural (e.g., discussions of self-talk) and art therapy strategies during the intervention groups.

The groups met weekly during the school year from September to May. Intervention was once a week for 1 hour and consisted of: an introduction with snack, 10 minutes of conversation skills practice (e.g., what happened today?), 30 minute structured art activity, and 20 minutes of free play with the group leader coaching/reinforcing appropriate social behaviour.

The *Social Skills Rating System (SSRS)* was utilized as a pre-/post-intervention assessment tool. The *SSRS* gathers information through parent and teacher report on a rating scale. This rating scale measures social skills (cooperation, assertion, responsibility and self-control) and problem behaviours (externalizing, internalizing and hyperactivity) through the questionnaires. The internal consistency of this measure is .83-.94 for the social skills questionnaire and .73-.88 for the problem behaviours questionnaire.

Statistical analysis was conducted using paired t-tests with the data collected. Results showed statistically significant changes ($p<0.05$) in the following: improvement in assertion skills, decrease in internalizing behaviours, decrease in hyperactivity, and a decrease in the overall problem behaviours throughout the course of the intervention. The rest of the skills measured did show improvement (except for responsibility); however, the changes were not statistically significant.

Overall, these results suggest that social skills group therapy utilizing art therapy may be a viable possible option for treatment of those within the autism spectrum. This level II research study led to some suggestive results. However, it should be noted that statistically significant changes were not found for all variables measured.

Conclusion

The studies reviewed used designs that are considered to be a relatively high level of evidence (level I and II) according to Dollaghan (2007), with the exception of the case study (level IV). In addition the overall quality of the studies was high. The studies used appropriate designs considering the heterogeneity of the population studied. While individually the studies do not provide compelling evidence regarding the treatment approaches that improve social skills in those with ASD, when combined the studies share similar conclusions. The replication of the results leads to an increased overall reliability of the evidence.

The results confirm that group instruction is an appealing and effective service provision option for SLPs treating social skills deficits in those children

along the autism spectrum. Each of the treatment approaches has its own pros and cons depending on your caseload, client characteristics and funding availability. All of the five approaches: modeling and reinforcement, peer-mediated interventions, reinforcement schedules and activities, scripts and social stories and miscellaneous were effective in eliciting some change in the social functioning of the children with ASD. However, no conclusion could be made regarding which approach was most effective due to the vast differences in research design, variables measured, and tools used to measure progress.

Recommendations

Further research is needed to clarify and confirm the research that has already been completed in the area of group instruction. Future research should include high quality quanitative research, as it would provide a stronger evidence base to our group service provision. As well, the addition of longer term follow-up of these children with ASD after a social skills program will allow for more valuable information regarding generalization of skills.

Speech language pathologists should continue to advocate for funding to create and administer social skills programs for those with ASD. Replicating some of the programs reviewed in this paper will allow for an evidence-based treatment selection which we are always striving to accomplish in our field.

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