

Critical Review:  
**Are social skill interventions an effective means of reducing social deficits in school aged children with fetal alcohol spectrum disorders?**

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This critical review examines the effectiveness of social skill interventions with school aged children who have documented FASD. Studies evaluated include a single subject "N of 1" AB case study design and a between groups nonrandomized clinical trial. Overall, findings suggest that interventions focusing on this domain may have positive effects on specific areas of functioning. Recommendations and clinical implications are also discussed.

### *Introduction*

The term Fetal Alcohol Spectrum Disorders (FASD) represents a continuum of disorders related to alcohol exposure in utero (Schonfeld, Paley, Frankel & O'Connor, 2009; Frankel & O'Connor, 2009). Fetal Alcohol Syndrome (FAS), Partial Fetal Alcohol Syndrome (Partial FAS), alcohol-related neurodevelopmental disorders (ARND) and alcohol-related birth defects (ARBD) are encompassed by the umbrella term FASD (Paley & O'Connor, 2009; Schonfeld et al., 2009; O'Connor et al., 2006). FAS represents the most severe end of the spectrum. Those with a history of prenatal alcohol exposure who do not meet criteria for FAS are still likely to experience significant deficits in many areas of functioning (Schonfeld et al., 2009). Prevalence rates are difficult to obtain as diagnosis depends on confirmation of alcohol consumption during pregnancy by the mother. The most recent prevalence rates (in the United States of America) estimate full FAS occurs in 2-5 cases per 1000; prevalence of the entire spectrum is estimated at 2-4% (Paley & O'Connor, 2009).

Children who meet criteria for FASD often experience significant cognitive, behavioural, adaptive, social and emotional impairments (Paley & O'Connor, 2009). Documented deficits include: speech and language delays, intellectual and learning disabilities, inattention, hyperactivity, problems with memory and executive functions, externalizing and internalizing behaviour problems and social impairments (Paley & O'Connor, 2009; O'Connor et al., 2006). Additionally, these children are at risk for continuing mental health issues, institutionalization, academic underachievement/failure, substance abuse and incarceration (Paley & O'Connor, 2009).

In addition to aforementioned deficits, significant impairments in social functioning are often present. Reported difficulties include: reading social situations,

interpreting and responding to social cues and communicating in social contexts (O'Connor et al., 2006). Additionally, caregivers of children with FASD have reported difficulty with perspective taking (Timler, Olswang & Coggins, 2005). Research indicates that these pervasive deficits are likely to continue into adulthood placing children with a history of Prenatal Alcohol Exposure (PAE) at risk for peer rejection and development of emotional/behavioural disorders (Paley & O'Connor, 2009).

Social skills represent an important intervention target particularly since poor early peer relationships are predictive of early school withdrawal, delinquency, depression, and anxiety (Paley & O'Connor, 2009). It is important to examine the evidence regarding social skill based interventions and their particular effectiveness for children with FASD given the pervasive nature of social deficits. Additionally, social communication is a common area addressed by the Speech Language Pathologist (SLP) (Timler et al., 2005).

### *Objectives*

The primary objective of this paper is to critically evaluate the existing literature on the effectiveness of social skill interventions on social deficits in school aged children with a history of FASD. A secondary objective is to develop evidence-based recommendations for clinical practice and to suggest areas for future research.

### *Methods*

#### Search Strategy

The internet databases CINAHL, PubMed, SCOPUS and MEDLINE were searched using the following terms:

((fetal alcohol spectrum disorders) OR (fetal alcohol syndrome) OR (prenatal alcohol exposure)) AND ((social intervention) OR (social skills) OR (social

communication) OR (social stories) OR (pragmatics) OR (social skills intervention)).

The search was limited to English articles. No limitations were set on date of publication.

#### Selection Criteria

Papers addressing social skill interventions provided to school-aged children with a documented FASD were included in this critical review. No limitations were placed on the type of social intervention provided that it targeted social and/or social communication skills.

#### Data Collection

The search of the literature yielded five articles that met criteria. Included articles consisted of: between-groups non-randomized clinical trial with two case control follow-ups, single subject "N of 1" AB case study design and a discussion paper.

#### *Results*

Two intervention approaches were discussed in the examined studies. Both targeted various social skills in a group based format.

#### Single Subject "N of 1" AB Case Study:

Timler et al. (2005) investigated the use of an untested program focusing on mental state verbs and social cognitive skills. The program was applied to a school aged child with FASD using a single subject "N of 1" AB case study design (level 1; highest level of evidence). This was a feasibility study which sought to determine the clinical viability of an untested intervention aimed at addressing the social deficits of this population. According to the authors, research indicates targeting mental state verbs improves performance on false belief Theory of Mind (ToM) tasks; a specific deficit the authors sought to address. Background information provided in the article appears to support this notion; however, findings also indicate that improving ToM performance does not necessarily improve social skills. To address this, the authors also targeted specific social cognitive skills including generating multiple strategies in a given situation and selecting the most appropriate response/solution while using a checklist.

This specific case study focused on 1 girl, aged 9 years 8 months. She was recruited from the University of Washington's Fetal Alcohol Syndrome Diagnostic Prevention Network Clinic. The group provided an in depth description of her birth, developmental and academic histories. Specific assessment results reported included: *Social Skills Rating System Parent (SRSS-P)*, non-standardized descriptive assessment of pragmatic skills, *Wechsler Intelligence Scale for*

*Children – III (WISC-III)*, *Comprehensive Assessment of Neuropsychological Development in Children (NEPSY)*, narrative memory task, *Clinical Evaluation of Language Fundamentals – 3 (CELF-3)* and informal probes. It was not stated if these tests were used to determine eligibility, appropriateness for treatment or if the assessments were performed by the study group. The child was enrolled in a six week intervention program. The first two weeks involved twice weekly one hour sessions while the final four weeks were a group based format which included two other children with FASD. Group based sessions were provided three times per week (two hours per session). Intervention data and probe data was collected to evaluate results (baseline probes, treatment data, post-treatment data). Data was graphed over a period of 12 weeks. Results indicated that the child was not observed to use mental state verbs prior to treatment; she had variable use during and following treatment. Available intervention data suggested a provided checklist was facilitative in generating alternative strategies during social interactions. It was reported that the child's first stated strategy was often an inappropriate response and that she required prompting to use the checklist during role play situations. Her ability to state the perspective of another when discussing consequences of her actions did not change as a result of treatment. No data was available for the other two children enrolled in the group program.

Inter-rater reliability was determined by having a student not involved in data collection score randomly selected responses. Reliability was calculated to be 100%. Any changes that occurred over the treatment block were not submitted to statistical analysis thus the significance could not be determined. However, the fact the group collected baseline data on 3 occasions does suggest treatment may have had an effect on use of mental state verbs. The authors concluded that although a single case study does not unequivocally determine an intervention's effectiveness, it does reveal possible benefits of treatment. Evidence from this study was judged to be equivocal based on the variable treatment findings, the lack of statistical analysis and the fact it was a single subject case study.

#### Between-Groups Nonrandomized Clinical Trial:

O'Connor et al. (2006) examined the impact of Children's Friendship Training (CFT) on the social knowledge of children with a documented or known history of prenatal alcohol exposure. The CFT treatment group was compared with a delayed treatment control group (DTC). The study design was a between groups nonrandomized clinical trial (level 1; highest level of evidence). Maintenance of gained skills was examined 3 months post treatment. According to the

authors, CFT is an empirically validated program based on the social learning theory (Frankel, 2005 as cited in O'Connor et al., 2006). It has been successfully used as an intervention for children, aged 6-12, with various clinical profiles.

Participants were recruited over a two year period. Letters were provided to local physicians and flyers were posted in medical clinics. Eligibility requirements included: 6-12 years of age, documented history of prenatal alcohol exposure, a score 1 standard deviation (SD) below the mean on the Socialization Domain on the *Vineland Adaptive Behavior Scales* and have a verbal IQ of  $\geq 70$  as measured by the *Kaufman Brief Intelligence Test*. Children with motor or sensory deficits and those with a diagnosis of pervasive developmental disorder were not included in this study. A study physician conducted a physical examination of each child to assess the diagnostic features of FASD as outlined by the *Diagnostic Guide for Fetal Alcohol Spectrum Disorders*. In total, 100 children met the above criteria for the study. Of these children, 11% presented with FAS, 43% with partial FAS and 46% with static encephalopathy which is consistent with ARND.

Cohorts were formed from groups of 14-16 consecutive children who enrolled in the study. In an alternating sequence, each child was assigned to the CFT treatment group or to the DTC group. The CFT group received 12 weekly sessions in a group based format while parents attended simultaneous instructional sessions on FASD. Following completion of the program by the CFT group, the DTC group was enrolled. Social skills were measured using the *Test of Social Skills Knowledge (TSSK)*, *SSRS-P* and *Social Skills Rating System Teacher (SSRS-T)* at 3 time intervals: pre-treatment, post-treatment and 3 months post-treatment for the CFT group and at baseline, pre- and post-treatment for the DTC group.

Sample size was determined using power analysis for a medium effect. To determine short term efficacy of CFT, a two-condition ANCOVA was used at the group level. Grouping factor, cohort, gender, and ethnicity were evaluated preliminary. Other possible covariates included child age, IQ, home placement, number of placements, FASD diagnosis, caregiver marital status, and education. Long term effect on outcome variables was calculated using a two-tailed pairwise *t* test in which two time periods acted as the dependent variables (baseline scores to 3 month follow-up scores and post-treatment scores to follow-up scores). In total, 96 children completed the baseline, 12 week post-treatment and wait periods of the study; two children

were not able to start treatment for various reasons and two were asked to leave the program due to aggressive behaviour. Two children did not complete the 3 month follow-up assessment due to multiple missed appointments.

Results from the study indicate that according to the *TSSK*, children in the CFT group showed significant improvement ( $p < .0001$ ) in knowledge of appropriate social behaviours. Analyses of the *SSRS-P* indicated that caregivers noted significantly improved social skills ( $p < .03$ ) and significantly decreased problem behaviours ( $p < .05$ ) for children in the CFT condition when compared with the DTC group. Teacher ratings, as measured using the *SSRS-T*, showed no treatment effect. Similar results were noted for the DTC group once they completed treatment. According to the *TSSK*, children showed significantly improved knowledge of social skills ( $p < .0001$ ) following treatment. Parents noted significantly improved social skills ( $p < .006$ ) and decreased problem behaviours ( $p < .01$ ).

Normative data was available for the *SSRS-P* and *SSRS-T*. In order to determine the clinical significance of the information obtained, the group completed a one tailed *Z* test using 1.5 SD around the mean as clinically normal. Following treatment, the CFT group scores on the *SSRS-P* were clinically equivalent to the normative group. It is important to note that the CFT group mean scores remained significantly different from the normative mean. Long-term maintenance of skills gained during treatment was assessed 3 months post-treatment. Only children in the CFT group were assessed, therefore, comparison between groups could not be made. Analysis revealed that gains made following treatment, as indicated by the *TSSK*, were maintained over a 3 month period. According to the *SSRS-P*, social skill gains increased between the post-treatment and follow-up measures ( $p < .002$ ). Problem behaviour scores remained lower than pre-treatment scores, but did not decrease significantly further. Teachers noted few gains from the post-treatment time period to the 3 month follow-up.

This study was well designed and all steps were thoroughly described. The authors provided thorough information regarding the FASD diagnosis process, study design, treatment content, therapist training, treatment integrity, eligibility measures, outcome measures and data analysis plan. Participant attrition was described in detail. It is important to note very few participants failed to complete the study in its entirety. The authors noted that gains were not noticed in the classroom; an important consideration when evaluating study results and applicability. They also noted that parents may have overestimated changes in their

children due to the fact they knew they were receiving treatment. The authors believed that because the children demonstrated a significant increase in their knowledge of appropriate social behaviours, changes can most likely be a result of treatment.

The authors commented on methodological issues including the exclusion of children with verbal IQ's below 70. This precludes generalization of findings to a large number of children with prenatal alcohol exposure. They believed further modifications may be necessary to allow for children with a verbal IQ below 70 to participate in the program. The method of participant recruitment also merits discussion. Caregivers voluntarily approached the group affecting the likelihood of a representative sample. The CFT group mean remained significantly different from the normative mean on the *SSRS-P*. The authors reported that this is likely a function of the structural changes to the brain resulting from alcohol exposure. Although changes in social knowledge were significant, outcome measures may have been unable to account for all skills important to social competence. A most significant result was that teachers noted no change following treatment. These are individuals who interact with these children on a daily basis in a variety of social situations. The fact they did not notice a change following treatment in either group limits the applicability of the program. There was also no mention of minimum attendance requirements for weekly sessions or minimum instructor qualifications. It is unknown how many children attended all intervention sessions. Study findings are, at most, suggestive.

Keil, Paley, Frankel and O'Connor (2010) further examined the study group from the O'Connor et al. (2006) study and applied additional outcome measures. Again, the study design was a between groups nonrandomized clinical trial (level 1; highest level of evidence). Specifically, this group sought to examine if CFT would lead to decreased hostile attributions by children with documented prenatal alcohol exposure. Group entry and peer provocation scenarios were examined. As mentioned, this paper included the same participants from the O'Connor et al. (2006) study. Recruitment procedures, eligibility criteria and treatment procedures remained the same. A Hostile Attribution Measure (Cartoon Stories Task) was conducted pre, post and a 3 month follow-up for the CFT treatment group. The DTC group completed 2 pre-intervention measures (baseline and pre-intervention) and 1 post-intervention measure. Participants were presented with 8 vignettes and were asked to pretend they were in the story. At the end of the vignette, the children were asked to explain why the peer did what they did. All responses were coded as

hostile or accidental/benign. The Hostile Attribution Tendency (HAT) score was obtained from the proportion of vignettes labeled as hostile. Responses were coded by independent raters blind to alcohol exposure and treatment status. Inter-rater reliability was reported at 0.87.

ANCOVA was used to examine the effect of treatment condition on the number of hostile attributions made in group entry and provocation scenarios. Results indicated that there was not a significant effect of treatment on the provocation domain ( $p=0.88$ ) but there was in the group entry domain ( $p<.05$ ). Following treatment, the CFT group made less hostile attributions in group entry scenarios when compared with the DTC group. This decline was maintained at the 3-month follow-up. A paired samples *t*-test comparing pre- and post-treatment HAT scores for the DTC also yielded significant results for group entry scenarios ( $p<.05$ ). Peer provocation results were not mentioned in final analysis for the DTC. The authors also noted that there were no differences in final HAT scores between the DTC and CFT groups suggesting there was no further decline while the DTC group waited for treatment.

As noted in the discussion of the O'Connor et al. (2006) study, an appropriate description of statistical analysis was provided. A follow-up article by Kiel et al. (2010) provided the readers with further detailed information regarding the eligibility assessments. The fact that treatment only yielded significant results in one domain warrants discussion. Treatment did not have an effect on peer provocation scenarios suggesting limited generalization of treatment effects. Further alterations to the CFT program may lead to improved HAT scores in the peer provocation domain. Keil et al. (2010) did not have normative data for HAT scores. Lack of available norms for HAT scores makes it difficult to determine if FASD scores were of initial concern. It is not known if the group had more hostile attributions than a child without FASD. The authors noted this limitation in their discussion. They noted some hostile attributions may in fact be normal for a child in this age range. There is limited ability to generalize findings given the verbal IQ score cut-off 70; this was also discussed in the study limitations. Additionally, The Cartoon Stories task may not have been the most appropriate measure of hostile attributions in this population given their difficulty with perspective taking. The authors conclude their findings suggest social skills training may be effective in improving hostile attributions during peer group entry situations. However, the uncertainty of the evidence and lack of normative data indicates findings are no more than suggestive.

### Variables Influencing Effectiveness of Treatment

Participants from the O'Connor et al. (2006) study were further examined to determine if specific variables impacted response to treatment. Schonfeld et al. (2009) examined the role that executive functions in treatment response. Results suggested ability to control impulsivity, problem solve and control one's emotional response predicted improved social skills and decreased problem behaviours on the *SRSS-P*. Furthermore, Frankel, Paley, Marquardt & O'Connor (2006) examined 77 children from the study group to determine the impact of medication status on response to treatment. Results suggested specific medications may influence overall response to CFT. Discussion of these studies is beyond the scope of this paper. For further information, please refer to the original studies.

### *Discussion*

Children with FASD represent a heterogeneous population; skill profiles may vary from child to child. Additionally, diagnosis of FASD will depend on parent report of alcohol consumption or report by a reliable source. As a result, this is a difficult population to study. Despite this, emerging literature is suggestive that social skill interventions may positively influence social knowledge, reported social skills, hostile attributions during group entry scenarios and reported problem behaviours. All studies revealed there was some positive effect from providing a social skill intervention for school-aged children with a documented FASD. Timler et al. (2005) found that one child with a documented FASD had variable use of mental state verbs during and following treatment; the subject used none at baseline. However, her ability to state the perspective of another when discussing consequences of her actions did not change as a result of treatment. O'Connor et al. (2006) noted improved social skill knowledge and parent report of social skills following CFT. Parents also noted a decrease in problem behaviours. Teachers failed to note improvement in either area in the classroom. Finally, Keil et al. (2010) found that, following CFT, children with an FASD had fewer hostile attributions during group entry scenarios. Peer provocation scenarios did not have significant improvement.

There were specific findings and limitations which warrant discussion. The body of literature regarding social skill training with children who have an FASD is extremely limited. A thorough search of the literature revealed three studies specifically addressing the question at hand; two of which used the same treatment population and one which reported results based on a single subject. Additionally, as noted earlier, evidence from the Timler et al. (2005) single subject case study

did not show an outright success of treatment. Results were equivocal as there was a lack of information regarding statistical analysis, limited treatment success, a lack of standardized assessment measures and the fact results were limited to one single subject. Additionally, O'Connor et al. (2006) failed to find results of treatment generalizing to the classroom. Teachers have a unique opportunity to see children interact in a variety of social interactions. Failure to observe improvements is a cautionary finding. Keil et al. (2010) only observed significant improvement in group entry scenarios. However, it is unknown if these children significantly differed from the norm at baseline.

Furthermore, there is limited knowledge regarding an appropriate approach to treatment design. Results from O'Connor et al. (2006) were suggestive of a positive effect of group treatment. CFT was designed from a psychological perspective and an SLP may not have the specific qualifications required to implement the program. Discussion of interventionist qualifications was not discussed in either paper in which CFT was the treatment of choice. The treatment program discussed in Timler et al. (2005) was designed from a speech and language perspective. The authors used a mixed treatment approach, combining individual and group therapy. This yielded with mixed results. Also, group therapy was intensive. Participants attended 3 sessions per week for 2 hours each. This may not be feasible in clinical practice. However, as previously mentioned, results from such study are equivocal. At this time, it is unknown which is most effective: individual or group treatment.

Finally, strict eligibility criteria of large studies implementing CFT limit the generalizability of results. Excluding children with a non-verbal IQ below 70 may limit applicability of results to a significant percentage of this population.

Additional research is required prior to implementation of such programs into clinical practice. Future areas of consideration include:

- a) Studies which include children with a verbal IQ below 70. This will allow for increased generalization of results.
- b) The specific role of the SLP in the management of social skill deficits in children with an identified FASD.
- c) Thorough description of specific approaches to treatment and their effectiveness in managing social skill deficits.
- d) Examination of the effectiveness of group versus individual treatment.

### *Conclusion*

Social deficits are of primary concern for children with FASD. To date, evidence of intervention targeting such area is, at best, suggestive. As this is a relatively new topic of interest in the literature, these studies may provide a foundation for further research.

### *Clinical Implications*

Pragmatics, in general, is an important area of concern for an SLP (Timler et al., 2005). Children with FASD may present with additional speech and language concerns or learning disabilities (Paley & O'Connor, 2009; O'Connor et al., 2006) and therefore been seen, at some point, by an SLP. SLPs need to be prepared to take the lead in addressing pragmatic deficits and do so in a flexible manner given the wide range of deficits these children face. At this time, the effectiveness of social skill interventions remains an important area requiring further investigation.

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