

### **Critical Review:**

Does animal assisted intervention have positive outcomes on the social/communication skills of children with Autism Spectrum Disorder?\*

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This critical review examines the efficacy of Animal Assisted Intervention (AAI) as a treatment approach for improving the social skills of children with Autism Spectrum Disorder (ASD). Four articles were reviewed including one single subject design, two randomized clinical trials, and a systematic review. Overall, the results of this review suggest that the use of AAI yields positive social outcomes for children with ASD. However, the implementation of more rigorous assessment tools and therapy protocols is required to strengthen the evidence. Clinical implications for professional practice and the need for further research are discussed.

#### ***Introduction***

Individuals with physical and intellectual disabilities have benefitted from the support of trained therapy animals, assisting with their activities of daily living and improving their quality of life (CRTASA, 2010). Animal Assisted Intervention (AAI) is a “goal-directed intervention designed to promote improvement in physical, social, emotional and/or cognitive functioning of the person(s) involved and in which a specially trained animal-handler team is an integral part” (Animal Assisted Intervention, 2013). One of the populations proposed to benefit from the implementation of AAI is people with ASD.

ASD is a complex developmental disorder characterized by two core symptoms: social-communication and repetitive and rigid behaviors (American Psychiatric Association, 2015). For several years, researchers have proposed, and provided some evidence supporting the use of, animal therapy to improve social skills and communication in individuals with ASD (Martin, 2002). The belief is that children will establish a bond with the animal and in turn be better at establishing bonds with people (Martin, 2002). However, to date, there is little concrete evidence proving that AAI is an effective intervention for children with ASD. Therefore, it is critical to evaluate the evidence base for AAI in order to determine whether or not the delivery of effective treatment could in fact improve the social and communication skills for children with ASD.

This critical appraisal will serve to inform clinical practice by evaluating whether current research evidence supports incorporating the use of animals in therapy in order to increase communication and social skills in children with ASD.

#### ***Objectives***

The primary objective of this paper is to critically evaluate the existing literature regarding the impact of animal intervention on social skills and communication of children with ASD. The secondary objective is to provide evidence-based clinical implications for Speech Language Pathologists interested in implementing AAI when working with children with ASD.

#### ***Methods***

##### Search Strategy

The following computer based search engines were used: Google Scholar, PubMed and Scopus. Keywords used during the searches included: [(Autism Spectrum Disorder) or (Autism) or (ASD) or (Pervasive Developmental Disorders) or (PDD)] and [(Animal Assisted Intervention) or (AAI) or (Animal Assisted Therapy)] and (Social Skills).

##### Selection Criteria

Studies selected for inclusion were required to (a) include children who had a diagnosis of ASD, (b) have implemented some form of animal therapy, and (c) have included an outcome measure of social skills and/or communication. No limitations were placed on study design, age of the child, or specific type of outcome measures. Non-experimental studies were excluded.

##### Data Collection

Results of the literature review yielded four articles meeting the inclusion criteria outlined above. Study designs included a single subject design, randomized clinical trials, and a systematic review.

*\*This paper was created as a required assignment for the CSD9639 Evidence Based Practice for Clinicians course at Western. While it has been evaluated by course instructors for elements of accuracy and style, it has not undergone formal peer-review.*

## **Results**

### Randomized Clinical Trial

**O’Haire McKenzie, McCune, and Slaughter (2014)** used a multi-site, randomized clinical trial design to evaluate the social interactions of children with ASD in the classroom setting. Participants were 64 children (aged 5-13 years) with a diagnosis of ASD. Children were separated into two groups: a waitlist group and a non-waitlist group. The non-waitlist group received therapy from at the onset of the study. The waitlist group began eight weeks later. Both groups participated in two 20-minute therapy sessions a week for eight weeks. The objective was to determine whether or not the implementation of Animal Assisted Activities (AAA) affected the social outcomes of these children as measured using the Pervasive Developmental Disorder behavior Inventory (PDDBI), a questionnaire consisting of 180-items and the Social Skills Rating System (SSRS), a 57-item questionnaire. Social variables measured included activities around caring for guinea pigs (e.g. holding, feeding, brushing, grooming) and turns and initiation of conversations with classmates during therapy sessions. The measures were administered to both groups upon entering the study to establish a baseline, intermittently throughout the study, and again upon completion of therapy to determine progress. The authors conducted a hierarchical linear model (HLM) analysis, which revealed no significant change in scores pre and post waiting period. However, there were significant differences before to after AAA. Post-Hoc analysis using Bonferroni correction confirmed these findings. These results suggested that the use of AAA in the classroom improved the children’s social skills.

Strengths of this study include an adequate sample size covering a wide range of ages. Also, the participants were measured across several different sites, which may allow for a more representative sample. Although the implementation of the assessment tools used to measure social outcomes is flexible in that they can be administered by an untrained parent or teacher, it is important to note that there is no mention of whether or not the assessment questionnaires were administered in a reliable and accurate way every time as the authors didn’t report inter-rater reliability. Also, findings rely on the subjective ratings of parents and teachers who were not blinded to the participant status. Another limitation of the study is that, when assigning children to the waitlist and non-waitlist groups, authors did not control for factors such as verbal ability, IQ, level of assistance in the classroom, or independent confirmation of ASD diagnoses. As a result, there may have been significant differences between the children

who were allocated into these groups. Although the experimenters did acknowledge this limitation, it raises concerns about unknown participant factors that may influence outcomes.

Overall this study offers a suggestive level of evidence that AAA improves social outcomes for children with ASD.

**Fung and Leung (2014)** conducted a randomized clinical trial in which children with ASD were separated into two groups. The first group (experimental group) participated in Animal Assisted Play Therapy (AAPT) with a real dog and the second group (comparison group) participated in play therapy with a baby doll (the real dog surrogate). Participants were 10 children (eight boys and two girls) ranging in age from 7 to 10 years who were enrolled in a school in Hong Kong. Children were paired based on intellectual disability, gender, and verbal ability. Then, one member of each pair was randomly assigned to one of the two treatment groups. After 14 individual therapy sessions, social outcomes were examined and compared between groups. The objective was to determine whether or not the children interacting with the real dog had more social gains than the children interacting with the baby doll during AAPT. Social skills were measured using a coding system created by the experimenters that evaluated the number of social behaviors (SB) and non-social behaviors (NSB) that took place during a 20-min therapy session. Social variables measured included sharing and responding to the therapist and animal, and communication measures included tracking verbal imitations, expression of needs, and asking questions. Pre-post treatment differences were analyzed both within-group and between-group. Results revealed that children in both groups made significant improvements in their verbal social behavior. The experimental group made more gains than the comparison group, however there was not a significant difference between groups.

The implementation of treatment for this study was excellent, taking into consideration continuity between each therapy session. The sessions were planned ahead of time to cover specific goals so every child in the AAPT group and the comparison group received the same therapy. Also, within-group and between-group data were analyzed using the Wilcoxon signed-ranks test. By measuring gains not only within a group but also between the groups, researchers were able to compare outcomes of therapy with a real dog and a surrogate, allowing some insight as to whether or not exposure to therapy is beneficial or if the dog contributed to social gains. Another strength of the study is that all therapy sessions were conducted by one therapist, which provided treatment fidelity. However,

experimenters did not analyze whether the therapist may have had an impact on treatment outcomes. As such, it is difficult to ascertain whether improvements were solely attributable to AAPT or whether the therapist may have also played a role. A quantitative observation scale was created to determine SB and NSB outcomes. The coders were selected ahead of time, blinded, and had high inter-coder agreement between both SB and NSB. However, this coding system was created by the experimenters, therefore, it is not clear whether the construct of the tool itself is valid. Weaknesses reported by the authors include a small sample size, which likely led to the non-significant outcome in their group comparison. Lastly, the overall sample size for this study was small and had a limited range in age amongst participants. As such, the sample is likely not a good representation of the general ASD population.

Overall, based on the low number of participants and the non-significant group comparisons, this study offers an equivocal level of evidence that AAPT does not result in social gains for children with ASD.

#### Single Subject Design (Behavior and verbal 662)

**Martin and Farnum (2002)** conducted a single subject design (multi-element) with 10 children ranging in ages from 3 to 13 years with a diagnosis of Pervasive Developmental Disorder (PDD). The children met with therapists one-on-one for a 15-minute therapy session three times a week for 15 weeks. Each week the child would be exposed to Animal-Assisted Therapy (AAT) with a live dog, therapy with an inanimate object (e.g. a ball), and therapy stuffed dog in order to determine if the real dog would elicit a greater number social behaviors than the inanimate objects. Sessions were recorded and randomized sections of the video were selected from a random coding sequence for observation. Four different coders were used to assess specific social and communicative behaviors including physical contact, answering yes/no questions, ignoring questions, social agreement, refusing to comply, echolalia, and crying. Children's interactions were measured as a function of three different conditions (e.g. dog, doll, ball) using repeated measures ANOVA. Results indicated that children were more likely to engage the therapist socially and maintain attention throughout sessions when the real dog was present.

Strengths of this study include the use of two different therapists who had received extensive training from members of the People-Pet Partnership to conduct the sessions. These therapists followed the same protocol, ensuring that the children were not impacted by the implementation of therapy in a different way. Another

strength was that children interacted with three different therapy dogs, which may support generalization. Authors acknowledge that a weakness of the study is that they employed a research protocol instead of a therapy protocol. Experimenters did not try to modify the children's behaviors, whereas, in a therapy protocol, they would have. Lastly, coders were not blinded to experimental conditions, which may bias their ratings.

Despite these limitations, evidence is suggestive that the use of AAT will improve social skills in children with ASD.

#### Systematic Literature Review

**O'Haire (2012)** conducted a systematic review of evidence on the efficacy of AAI for children with ASD from 14 studies. O'Haire found that, although evidence did support the use of AAI for improving the social skills of children with ASD, there seemed to be a lack of strong methodology across AAI research causing researchers to rely on anecdotal reports. O'Haire pointed out that, because there is no universal term for AAI, a universal protocol for tracking data/therapy has not yet been created and standardized. Therefore, research and evidence for the use of AAI to increase social/other outcomes for children with ASD is in initial stages, and further research is needed.

The review was clearly outlined the objective for the review, protocol that was followed, methods used, and approach to locating articles, which is a strength. Also, a thorough list of search terms was generated and many databases were used to search for an exhaustive list of terms when searching for articles for inclusion. The author also took into consideration the methods used to compile data and administer therapy, and weighed the effectiveness of those methods. The fact that author did not have multiple blinded reviewers coding each article is a limitation. Instead, the coders worked together to summarize and interpret results.

This review provides an equivocal level of evidence for the use of AAI as an effective intervention for children with ASD.

#### *Discussion*

Research investigating the use of AAI to increase communication/social skills in individuals with ASD yielded an equivocal level of evidence. Although all of the studies included in this review indicated that participants made gains in their social and

communication abilities, gains were not statistically significant.

Although studies consistently demonstrated adequate statistical analysis of experimental data, the research reviewed had several limitations. With the exception of O'Haire et al. (2014), the most apparent limitation across the studies was the use of small sample sizes (10 children). This limits the likelihood that the children used in the research represent the ASD population as a whole.

Another limitation shared by all of the studies was the ages of the participants included. Research has indicated that the implementation of early intervention services from birth to age three is helpful for children with ASD (CDC, 2015). However, only one of the studies reviewed included a child that was three years old. Having more data for children ages three and younger would be highly beneficial.

As a relatively new therapy approach, AAI does not yet have a universal term. A possible consequence to this is a lack of uniformity across study methodology in terms of how therapy is being executed and progress is being measured. As such, a considerable methodological weakness across all studies was the failure to consistently implement a standardized therapy protocol. In addition, with the exception of O'Haire (2014), researchers also failed to administer standardized measures of baseline and progress.

### ***Clinical Implications***

As more research is conducted, there is growing evidence indicating that some type of interaction or animal based therapy has proven helpful in improving the social and communication abilities of children with ASD. However, articles appraised in this literature review provided only an equivocal level of evidence. As such, the implementation of AAI for children with ASD cannot be considered an evidence-based intervention at present.

Additional research is necessary prior to the implementation of AAI in a clinical setting in order to address the limitations previously discussed throughout this literature review. Recommendations for future research include:

- Create a universal term for Animal Assisted Intervention

- Develop a standardized protocol for delivering therapy
- Blind all raters and therapists involved in the study/therapy
- Increase sample sizes in order to ensure better representation of the ASD population
- Research the effects of AAI on children under the age of three years

### ***References***

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5<sup>th</sup> ed.). Washington, DC.
- Canadian Registry of Therapy Animals and Service Animals (2010). Why we are needed. Retrieved February 8, 2015, from <http://www.crtasa.com/why-we-are-needed.php>
- Animal Assisted Intervention (2013). Animal Assisted Intervention (AAI). Retrieved March 6, 2015, from <http://www.animalassistedintervention.org/AnimalAssistedIntervention.aspx>
- Fung, S. C., & Leung, A. S. M. (2014). Pilot study investigating the role of therapy dogs in facilitating social interaction among children with autism. *Journal of Contemporary Psychotherapy*, 44(4), 253-262.
- Martin, F., & Farnum, J. (2002). Animal-assisted therapy for children with pervasive developmental disorders. *Western Journal of Nursing Research*, 24(6), 657-670
- O'Haire, M. E. (2012). Animal-assisted intervention for autism spectrum disorder: A systematic literature review. *Journal of Autism and Developmental Disorders*, 43(7), 1606-1622.
- O'Haire, M. E., McKenzie, S. J., McCune, S., & Slaughter, V. (2014). Effects of classroom animal-assisted activities on social functioning in children with autism spectrum disorder. *Journal of Alternative and Complementary Medicine*, 20(3), 162-168.
- Treatment. (2015, February 24). Retrieved April 8, 2015, from <http://www.cdc.gov/ncbddd/autism/treatment.html>