

## **Final Research Study Report from Margaret M. Bass, Ph.D. & Maria Llabre, Ph.D., HHRF Grant Recipients**

To date, there have been few studies that have been implemented to assess animal assisted activities on the cognitive, physical, psychological and social domains of individuals with developmental disabilities. The goal of this study was to replicate our 2006 pilot study by further investigating the effects of equine assisted activities on social functioning in children with autism (ages 7-12), using a larger sample size, additional controls, and an extended assessment period. We hypothesized that the experimental group (n= 25) exposed to twelve weeks of equine assisted activities would exhibit improvement in social functioning and attention relative to control participants (n=25) at the completion of the intervention. We further hypothesized that the effects would sustain two months following the intervention. The data was collected from the participants' parents and teachers and the analysis was performed using SPSS.

During the intervention phase, the participants were provided twelve consecutive EAA activities, each session lasting one hour and fifteen minutes each week. The weekly sessions provided the project participants training within the following program facets: grooming and tacking assigned equine, mounting/dismounting, warm-up exercises, riding skills, & mounted games (individual/group). The EAA activities utilized were selected to target the participants' vestibular processing while also allowing the children to engage in physically demanding exercises to increase attention, cognition, communication and sensory processing.

### **Measures**

The Social Responsiveness Scale (SRS) and Sensory Profile (SP) were used in the analysis to assess social functioning at three times during the study: pre-and-post intervention and a two month follow-up. The Social Responsiveness Scale (SRS) (Constantino, 2002) is a 65-item questionnaire that measures the severity of autism spectrum disorder symptoms. Raw scores were computed for five treatment subscales: social awareness, social cognition, social communication, social motivation, and autistic mannerisms. The SRS has high overall internal consistency ( $\alpha = .97$ ), and retest temporal stability in males and females ( $r = .85$  and  $r = .77$ , respectively). Internal consistency for each treatment scale was also tested and yielded high Cronbach alpha scores, with social communication being the highest ( $\alpha = .92$ ) (Constantino, 2002).

The Sensory Profile (SP) (W. Dunn, 1999) is a 125-item questionnaire that is administered to parents or teachers (School Companion, W. Dunn, 2006). This measurement uses a 5-point Likert scale ranging from 1 (*always*) to 5 (*never*). The questions address overall social functioning and the degree to which children exhibit problems in (a) sensory processing, (b) modulation, and (c) behavioral and emotional responses. The SP for parents is composed of nine subscales: sensory seeking, emotionally reactive, low endurance/tone, oral sensory sensitivity, inattention/distractibility, poor registration, sensory sensitivity, sedentary, and fine motor/perception. The School Companion is scored in four quadrants: registration, seeking, sensitivity, and avoiding.

### **Data Analysis and Results**

#### ***Pretest***

Means and standard deviations were computed for all subscales from the SRS and SP administered to the parents and the teachers at each of the three time points (pretest, posttest, and follow-up). We first compared the groups on their means at pretest using independent group t-tests. We then compared them at posttest and at follow-up. All t-tests were conducted at the .05

level of significance. A comparison between the treatment and control groups on the SP subscales administered to parents revealed no significant difference ( $p > .05$ ) between the means on any of the subscales. Similar results were obtained when comparing the means between the two groups at pretest for the teachers' subscales based on the four factors and the four quadrants.

With respect to the SRS, a comparison between the treatment and control group subscale means at pretest indicated no significant difference ( $p > .05$ ) on the parent or teacher data. We concluded that the randomization rendered the two groups comparable with respect to the outcome measures at pretest.

### ***Posttest***

For the parent data, t-tests comparing the means between the treatment and control groups at posttest indicated significant group differences on the following SP scales: sensory seeking, emotionally reactive, inattention/distractibility, and sensory sensitivity ( $p$ 's  $< .05$ ). Group differences were not statistically significant at posttest on the following SP scales from the parents: low endurance/tone, oral sensory sensitivity, poor registration, sedentary, and fine motor/perceptual ( $p > .05$ ).

For the SP teacher data at posttest, all four quadrant scores: registration, seeking, sensitivity, and avoiding; as well as all four factor scores: need for external supports, awareness and attention, tolerance for sensory input, and availability for learning yielded significant mean differences between treatment and control groups ( $p < .05$ ).

In terms of the SRS parent data, significant group differences at posttest were observed in all but one subscale. There was no significant group difference in the awareness subscale ( $p > .05$ ). However, the differences in cognition, communication, motivation, and mannerisms were significant ( $p < .05$ ). For the teacher SRS data, significant group differences in the means were observed on all the subscales.

More specifically, compared to wait list control participants, autistic children in the experimental group improved in critical areas such as sensory seeking, emotional reactive, inattention/distractibility and sensory sensitivity. The experimental subjects also demonstrated improved cognition, communication as well as motivation following the intervention. Both parents and teachers observed treatment effects at the first posttest. Although there was a significant difference following the initial posttest for the experimental group, these effects had subsided for most of the subscales except for three scales of the SP completed by parents.

This study is the second of its kind to evaluate and quantify the impact of EAA on the social functioning of children diagnosed with ASD. Our results indicate that EAA services are a beneficial intervention for this population. We are very appreciative to the HHRF for funding this research project and we hope the results will provide important evidence for the effectiveness of EAA activities.