



**Horses & Humans Research Foundation**

***The Effect of Equine Assisted Activities on the Social Functioning in Children with Autism***

**Research Team: Good Hope Equestrian Training Center, Inc.**

## **I. Scientific Abstract:**

Autism is a neurological disability characterized by impairments in social interaction, communication, and emotional behavior. To date, there have been few studies that have shown animal assisted activities benefit the cognitive, psychological and social domains of individuals with developmental disorders. Equine assisted activities; a subtype of animal assisted programs has been used to treat populations with physical and mental disabilities. The goal of this study is to replicate a pilot study by further investigating the effects of equine assisted activities on social functioning in children with autism, using a larger sample size, additional controls, and an extended assessment period. We hypothesize the experimental group (n= 25) exposed to twelve weeks of equine assisted activities will exhibit improvement in social functioning and attention relative to control participants (n=25) at the completion of the intervention. We further hypothesize the effects will maintain two months following the intervention. The data will be collected from the participants' parents and teachers and the analysis will be done using SPSS. Descriptive statistics will be calculated and frequency distributions will be examined. The results from this study will provide further evidence that equine assisted activities are a viable option in treating children with autism.

## **II. Need/Justification:**

Autism is a pervasive developmental disorder, identified as neurological and characterized by severe impairment in several areas of development, including social, communication, and motor skill functioning (American Psychiatric Association, 2007). Classic features include lack of social awareness and communication, deficits in sensory integration, and an inability to initiate directed attention. Autism affects 1 in 150 births (Centers for Disease Control and Prevention, 2007).

The economic impact of this disease is estimated to cost \$30,000 per year per child. It can cost about \$3.2 million to take care of an autistic person over his or her lifetime. Data from the Family Experiences with Autism Survey showed that families of autistic children had financial problems due to un-reimbursed medical and therapy expenses (Baker & Sharpe, 2007). Although many therapies, treatment programs, dietary regimens, and other interventions have been proposed, few have shown improvements among children diagnosed with autism. Proposed therapies with some documented success include the following: Applied Behavior Analysis, Sensory Integration Therapy, Relationship Development Intervention, Hyperbaric Oxygen Therapy, and the Floortime program.

Applied Behavioral Analysis is an intensive teaching program based on the work of Skinner, first published in 1938. Lovass designed a structured teaching program with lessons broken down into simple elements and used with repeated trials. In each trial, the child is presented with a stimulus and is encouraged through positive reinforcement. Significant improvements were made when children were taught using these principles twenty to forty hours per week (Lovass, 1987; McEachin, Smith, & Lovass, 1993).

Sensory Integration therapy (Ayres, 1972), has been used by occupational therapists and involves placing the children in a room specifically designed to stimulate and challenge all of their senses. It is based on the assumption that the autistic child is either over-stimulated or under-stimulated by the environment. Since sensory information received from the environment is vital, relations between the child and the environment shape the brain and influence learning. The aim of this therapy is to improve the ability of the brain to process sensory information for more effective function (Schaff & Miller, 2005).

Relationship Development Intervention (RDI) (Gutstein & Sheely, 2001) involves the use of parents and peers serving as “coaches” in a process that includes structured social games and activities. Proponents of the program assert that neurologic changes create flexible thinkers and creative problem solvers, and assist children in expanding the quality of relationships and social experiences. According to RDI (Nancarrow, 1998), over 70% of participants in their initial study improved their diagnosis on the Autism Diagnostic Observation Schedule (ADOS). On follow-up testing administered within eighteen months, over fifty percent of the RDI group scored in the non-autism category.

Hyperbaric Oxygen Therapy (HBOT) has been used with clinical success in several cerebral hypoperfusion syndromes. Studies have shown that individuals with autism have diminished blood flow to the temporal regions of the brain that affect language comprehension and auditory processing. Rossignol (2007) hypothesized that HBOT would compensate for decreased blood flow to these areas, in return diminishing stereotypical autism behaviors. In a study of the effects of the HBOT on autistic children, the group who received forty treatments of HBOT made improvements in cognition, language, and development of new words and sentences.

The Floortime program (Greenspan, 2006) has taken a social rather than a behavioral approach to autism. This approach seeks to help autistic children develop self and other concepts by working through the child’s interests. Unlike the behavioral approaches, in Floortime exercises the child is the leader. According to Greenspan, children who comprehend and control their emotions are able to regulate their behavior. In the program, the therapist or parents follow the child’s cues and works within their interests, gradually introducing observation, parallel play and ultimately, taking turns and social interactions. A follow-up study found that children

became more empathetic, creative, and reflective through the use of this tool (Greenspan & Wieder, 2006).

The National Academy of Sciences (NAS), in its report, “Educating children with Autism”, stated that research supports a number of approaches, but there is no proven “relationships between any particular intervention and the children’s progress.” The NAS analysis also stated that interventions are moving toward naturalistic, spontaneous types of learning situations that follow the child’s interest.

Over the past few years, interest in animal assisted activities has increased. However, research within the field of equine assisted therapies & activities has been limited. Recent attention has focused on animal assisted therapy as a therapeutic option for a wide range of developmental disorders. Animal assisted therapy, defined as using animals within a goal oriented setting to implement treatment, has been shown to significantly benefit cognitive, psychological, and social domains (Fine, 2006). Studies suggest that animal assisted therapy also influences physiological factors such as lowered blood pressure, heart rate, and decreased anxiety levels (Morrison, 2007).

Equine assisted programs, a subtype of animal assisted services have been used to treat populations with physical and mental disabilities. Therapeutic horseback riding is defined as using horseback riding activities to improve posture, balance, and mobility while developing a therapeutic bond between the patient and horse (All, Loving, & Crane, 1999). Equine therapy, better known as hippotherapy has been known to stimulate multiple domains of functioning and has been viewed as a promising alternative for children with neurological disorders who generally present a combination of motor, cognitive, and social disabilities.

Although we found no studies on equine assisted activities or horse related therapies for individuals with autism, there have been studies that have explored the benefits of animal assisted therapies. For example, Martin and Farnum (2002) evaluated whether therapy that involved interacting with dogs would lead to an increase in social initiation among children diagnosed with pervasive developmental disorders. Participants were exposed to three different conditions: (a) a nonsocial toy, a ball; (b) a stuffed dog; (c) a live dog. Ten participants were evaluated according to prosocial and nonsocial behaviors. During the 15 week intervention, children were exposed to all three conditions. They found that participants in the live dog condition engaged in initiating behavior and were more likely to talk to the dog, keep a focused gaze, and engage the experimenter in discussion about the dog, compared to either the stuffed dog or nonsocial toy conditions.

Sams, Fortney, and Willenbring (2006) investigated the effects of occupational therapy incorporating animals versus standard occupational therapy techniques in 22 autistic children 7-13 years old. The researchers hypothesized that the animal integrated therapy would elicit more social interaction and language use. During the fifteen week study, the subjects took part in bi-weekly occupational therapy sessions; one with an animal present, and one without. The activities targeted sensory integration, language use, sensory skills, and motor skills. Children engaged in significantly greater use of language and social interaction during the animal therapy relative to the standard occupational therapy.

As this brief review indicates, there are some treatment strategies for dealing with autistic children, but to date, there is no consensus as to which therapy and/or activity is most effective. It is possible that animal-assisted activities may provide a multisensory environment that will prove beneficial to children with profound social and communication deficits. We propose that

equine assisted activities may be particularly effective in treating children with autism spectrum disorders.

Anecdotally at GHETC we have observed improvements in the physical, cognitive, social and emotional well-being of more than six hundred children, youth and adults who participate in its equine-related programs since its inception. Our program appears to provide a powerful, effective, equine facilitated sensory integration design to help children whose means of collecting, processing and communicating information is not being fully addressed by traditional methods. It seems the bonding between the horse and participant facilitates a relaxed, emotional shift that promotes self-awareness, confidence, communication and learning.

The mounted equine assisted activity gives the rider a very different perspective, literally and figuratively, on themselves and their surroundings. Physically, the natural gait of the horse exactly duplicates the vestibular motion of the human walk, side to side, forward and up and down. The horse is a multi-sensory tool which can assist the autistic child to integrate their senses and better understand how their bodies relate to external forces and surfaces. The excitement of the experience may encourage speech when communicating with the horse or instructor. The non-judgmental feature of the equine creates a bond between the horse and the child, encouraging the child to form an attachment with another living being, which is especially difficult for autistic children to achieve.

We have conducted a pilot study to test our program in a sample of autistic children. As detailed in the following section, our preliminary results are very promising. The pilot study was the first of its kind to evaluate and quantify the impact of equine assisted activities on the social functioning of autistic children. However, in the search for best practices with this population, replication is needed to further assess its therapeutic effects with better controls. The ultimate

goal of the study is to replicate the effects of equine assisted activities on the social functioning of children with autism.

### **III. Research Narrative:**

The purpose of the proposed project is to replicate the pilot study (see below) with a larger sample, additional controls, and an extended assessment period. The following research questions will be addressed:

1. Do equine assisted activities improve the social function and attention of children diagnosed with autism spectrum disorder?
2. Do the effects sustain two months after the intervention is completed?

We **hypothesize** autistic children exposed to twelve weeks of equine assisted activities will exhibit improvement in social functioning and attention relative to control participants at the completion of the intervention. We further hypothesize the effects will maintain two months after the end of the intervention.

### **IV. Design & Methods:**

The study will be a two group randomized experimental design with repeated assessments taken at baseline, at the completion of the intervention (12 weeks later), and two-months (8 weeks later) after completion of the intervention. Participants will be recruited from three agencies: the Agency for Persons with Disabilities, the University of Miami Center for Autism and Related Disabilities (CARD), and Parent to Parent of Miami-Dade County. GHETC has established collaborative partnerships with these agencies.

Parents of potential participants will receive a letter describing the study. The letter will be followed with a phone call to answer questions and screen candidates to insure they meet **eligibility criteria**. For admission into the study participants must be

between 7 and 12 years old and have received a diagnosis of autism spectrum disorder as specified in DSM-IV-TR (American Psychiatric Association, 2007) spectrum diagnosis from the referring agency and/or the child's physician. Parents must consent to pre-testing, twelve weeks of equine assisted activities and two post testing sessions. The subjects selected will have had no significant equine therapy, which constitutes that the child has not received hippotherapy services by a licensed therapist (Occupational Therapist, Physical Therapist &/or Speech Therapist) over the past year. If the subject had received hippotherapy within their lifetime, participation will not exceed six months of treatment. The subjects selected for this study will have had no experience in equine assisted activities provided by a NARHA certified riding instructor. The subjects from both groups will need to have medical approval from their doctors prior to their enrollment.

The equine assisted activity sessions will take place at GHETC in Miami, Florida. GHETC is the only Miami-Dade County Premier Accredited North American Riding for the Handicapped (NARHA) facility. The five GHETC personnel involved in this study consist of (3) certified NARHA riding instructors, as well as (2) instructors in-training. The thirty trained volunteers who will assist during the equine assisted activity classes will be required to complete the GHETC volunteer training course & the NARHA on-line volunteer course to ensure that each individual has mastered the following duties: horse handler, side walker & assistant during mounting/dismounting procedures. GHETC will utilize (30) trained and experienced volunteers to assist the instructors during the interventions, as well as to set-up the riding ring for the classes. These groups will be broken down into two groups: morning shift (7:45 a.m. – 12:00 p.m.) & afternoon shift (12:45 p.m. – 4:15 p.m.). The morning group will work within their

assigned duties, thus assisting the instructors during class I (8:00 a.m. – 9:15 a.m.), class II (9:30 a.m. – 10:45 a.m.) & class III (10:30 a.m. – 11:45 a.m.). The second group of (15) volunteers will assist with class III (1:00 p.m. – 2:15 p.m.) & class IV (2:30 p.m. – 3:45 p.m.). Each volunteer will be assigned to the same equine/subject throughout the intervention.

The first fifty children, who meet the study criteria, obtain a signed medical application from their doctor, and signed copy of the Equine Release and Authorization for Emergency Medical Treatment Consent form will be enrolled in the study. Participants will be randomized into the two conditions using a randomization schedule provided by the statistical consultant. Participants randomized into the experimental condition will receive free-of-charge therapeutic riding instruction in a group format with lessons scheduled on Saturdays from 8:00 a.m. – 4:00 p.m. for 12 weeks on the following dates: January 10, 17, 24 & 31<sup>st</sup>; February 7, 14, 21, & 28<sup>th</sup>; March 7, 14, 21 & 28<sup>th</sup>. Those participants randomized into the control condition will be placed in a wait-list. This group will be provided twelve equine assisted activity sessions following the completion of the 2nd post intervention survey. The control group recipients will be provided (12) one hour and fifteen minute free-of-charge sessions upon completion of all assessments. The control group participants will be provided their equine assisted activities on the following dates: August 1, 8, 15, 22, & 29; September 12, 19, 26; October 3, 10, 17, & 24, 2009. Parents and teachers of all the participants will complete the pre-study assessment before the first day of the intervention. Pre-study assessment forms along with instructions for completion will be mailed to the parents and the teachers to be returned prior to randomization. Once the pre-assessment forms are complete, families will be informed of the time of the start of their child's riding program (the intervention program will precede the control program). Horses used in the equine assisted activity sessions will be randomly assigned to each participant. All pre-test

measurements will be given to parents and teachers in both the experimental and control group prior to the implementation of the equine assisted activity sessions.

The intervention participants will participate in the lessons for twelve consecutive weeks. The weekly hour and fifteen minute lessons will consist of five riders in five group sessions. Each of the twelve week sessions (described below) will incorporate the following components: horsemanship training, mounting/dismounting, warm-up exercises, riding skills, & mounted games. After 12 weeks, parents and teachers of participants in both the intervention and control conditions will complete the post-test measures. Two months after completion of the intervention, parents and teachers of the experimental and control group participants will again complete the post-test measures. Following the 2<sup>nd</sup> post-testing, control participants will be offered their equine assisted activity sessions.

### ***Horsemanship***

During the first fifteen minutes of each equine assisted activities session, participants will learn how to properly groom and care for their horse/pony by learning to identify grooming tools, (e.g., curry comb, hoof pick, body brush, mane/tail comb), as well as grooming equipment. Participants will also be instructed about basic horse anatomy and the corresponding human parts (i.e. the hoof is like what human body part).

### ***Mounting/Dismounting***

The trained GHETC instructors will assist the subjects in mounting and dismounting their program horse/pony. These processes will be verbalized to the subjects using step by step instructions. The mounting/dismounting segment of the therapy will last up to ten minutes and will be aimed at stimulating verbal communication and vestibular processing.

### ***Exercises and Riding Skills***

The subjects will perform at least ten minutes of warm-up exercises to stretch their bodies in preparation of the riding class. The participants will routinely perform a series of the following exercises: arm circles (forward & backward), trunk twists, opposite toe touches & two-point. Through the direction of the riding instructors, the trained side walkers will provide the riders verbal and/or physical prompts as needed to assist them in acquisition of the exercises. This activity will target the participants' vestibular processing while also allowing the children to engage in physically demanding exercises that will prepare them for the development of their riding abilities. Twenty minutes of riding skills, specifically designed to stimulate sensory seeking, as well as gross and fine motor domains, will follow the exercises. Participants will be instructed to perform the following skills: direct rein, open guided rein, two-point, and use of proper riding aids (leg, seat, hand & voice), upward and downward transitions (halt/walk/trot, trot/walk/halt), as well as posting at the walk and trot.

### ***Mounted Games***

The final segment of the equine assisted activities session will last twenty minutes and will focus on individualized and group games while on the horse. The games will be carried out by the instructor and will be focused on social and communication skills. The following games will be incorporated as a part of the sessions: Simon Says, catch and throw, red light/green light, letter games and musical letters.

### **Measures**

Parents of all participants will complete a baseline questionnaire designed specifically for this study. The questionnaire will include demographic information, history of other interventions, and history of medication. In addition, parents and teachers of all participants will

complete the Social Responsiveness Scale (SRS) and Sensory Profile (SP) at baseline and twice post-intervention: twelve weeks after the baseline, and again eight weeks after the first post-test.

### ***Social Responsiveness Scale***

The Social Responsiveness Scale (SRS) is a 65-item questionnaire that measures the severity of autism spectrum disorder symptoms. Scores may be computed for five treatment subscales: social awareness, social cognition, social communication, social motivation, and autistic mannerisms. Participants' are rated on a 4-point Likert scale; 0 (never true) to 3 (almost always true). Examples of questions include: "Seems much more fidgety in social situations than when alone" (social motivation subscale), and "Doesn't recognize when others are trying to take advantage of him or her" (social cognition subscale) (Constantino, 2002, p. 17).

### ***Sensory Profile***

The Sensory Profile (SP) is a 125-item questionnaire which uses a 5-point Likert scale; 1 = Always, 2 = Frequently, 3 = Occasionally, 4= Seldom, and 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 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.

### **Assessment Procedures**

There will be two University of Miami senior year Psychology students who will be responsible for the collection and management of the data. These students will work under the supervision of Dr. Maria Llabre, Ph.D. who is a Professor of Psychology and Director of Biobehavioral Statistics at the Behavioral Medicine Research Center, University of Miami. The students who will be blind to the group status, will coordinate the mailing of the baseline

assessments, including any follow up telephone calls necessary to insure all materials are returned.

Upon completion of the intervention, the UM students will set up appointments with the parents at GHETC for the completion of the post-testing. Teachers will be mailed the post-test questionnaires. Parents and teachers of all participants will re-evaluate the participants after the two months delay using similar procedures.

### **Data Management and Analysis**

All questionnaires will be delivered to the University of Miami Behavioral Medicine Research Center where the responses will be entered into a database, the questionnaires will be scored, and the data will be analyzed. The UM students will be responsible for these activities under Dr. Llabre's supervision. The data analysis will be done using SPSS, a statistical analyses program. Prior to analysis, all data will be checked for accuracy and completeness. Descriptive statistics will be calculated and frequency distributions will be examined. Mixed model analysis of covariance will be used to compare the two groups on the change from pre to post-testing for each instrument separately. Prior therapy and medication will be used as control variables. Gender differences will be examined if a sufficient number of girls is obtained. Significant condition by time interactions will be followed by paired t-tests for simple effects. For the intervention group, paired t-tests will be done comparing the two post-test assessments. The dependent variables will be the total scores and the subscale scores on both measures. Parents and teachers scores will be examined separately. All tests will be conducted at the .05 level of significance.

## **V. Pilot Study Results:**

In a pilot study, we tested the efficacy of a similar equine assisted activity intervention in a sample of children with autism spectrum disorder recruited from the same agencies as proposed in this application. We hypothesized that participants in the experimental condition ( $n = 19$ ), compared to those on the wait-list control ( $n = 14$ ), would demonstrate significant improvement in social functioning following the 12-week program. We found that children exposed to equine assisted activities exhibited greater sensory seeking, sensory sensitivity, social motivation, and less inattention, distractibility and sedentary behaviors. The results provide preliminary evidence that equine assisted activities may be a viable option in treating these children.

We report the means and standard deviations of all subscales administered pre and post intervention for the experimental and control groups in the Appendix. With respect to the Sensory Profile overall score, there was a statistically significant group by time interaction,  $F(1, 31) = 10.98, p = .002$ . As follow up to the interaction, paired samples  $t$  tests revealed that the pre to post change for the experimental group significantly increased,  $t(18) = 7.29, p < .01, d = .59$ , while the pre and post means of the control group only marginally increased,  $t(13) = 1.77, p = .101$ . As a follow up to the significant difference in change on the total score, interactions effects were examined for the subscales. Treatment effects for four out of the five subscales were significant: sensory seeking,  $F(1, 30) = 17.09, p < .01$ , attention and distractibility,  $F(1, 29) = 19.17, p < .01$ , sensory sensitivity,  $F(1, 31) = 31.01, p < .01$ , and sedentary,  $F(1, 31) = 18.59, p < .01$ . There was no significant interaction within the fine motor and perceptual subscale.

A statistically significant group by time interaction was also present in the Social Response Scale overall score,  $F(1, 20) = 4.92, p = .038$ . As follow up to the significant

interaction, simple effects paired sample  $t$  tests uncovered that the experimental group significantly increased,  $t(10) = 2.87, p = .017, d = .66$ , while the pre to post means for the control group remained unchanged,  $t(10) = .108, p = .916, d = .02$ . Interactions were examined for the subscales of the Social Response Scale. The interaction effect of the social motivation subscale was significant,  $F(1, 25) = 4.80, p = .038$ . No significant interactions were found among the social cognition and social awareness subscales.

Based on this pilot study we conducted a power analysis to determine the necessary sample size for our proposed study using the smallest of the effect sizes for the social cognition (.71) and social awareness (.59) subscales. We found that a sample size of  $n = 50$  (25 per condition) will yield 80% power to detect those effects.

#### **VI. IRB Process:**

GHETC utilized the Western Institutional Review Board (WIRB) for the review and approval of the research study protocol. WIRB provides review services for more than 100 institutions, as well as individual investigators in the US and internationally. WIRB is fully accredited by the Association of Human Research Protection Programs (AAHRPP).

#### **VII. Proposed Timeline:**

**October 2008 - December 2008:** Referral of subjects, randomization of sub-groups and dissemination and collection of pre-intervention surveys; **January 2009 – March 2009:** 12 week intervention provided to Experimental group; **April 2009:** Post-intervention surveys disseminated and collected from subgroups. **April 2009 – May 2009:** two month delay for the 2<sup>nd</sup> post testing for experimental and control groups; **June 2009:** 2<sup>nd</sup> post-intervention disseminated and collected from experimental and control groups. **July 2009 – August 2009:** Study data will be entered into database, scored and analyzed; **September 2009 – November**

**2009:** The principal investigator and the statistician will prepare the results of the study for manuscript.

### **VIII. Intent to Publish**

In April of 2008, the results of our pilot study were presented at two conferences: Vanderbilt University, as well as the U of M Research & Creativity Forum. It is the intent of the principal investigator, Margaret M. Bass, Ph.D. and the statistician, Maria Llabre, Ph.D. to publish and present our pilot study data, as well as this research study to various professional organizations throughout the country and abroad. We are considering the following refereed journals for the submission of our manuscripts: Journal of Autism and Developmental Disorders, International Journal of Special Education, Research in Developmental Disorders & Palaestra: Forum of Sport, Physical Education & Recreation for Those with Disabilities.

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**GOOD HOPE EQUESTRIAN TRAINING CENTER, INC. (GHETC)**

<b>CATEGORY</b>	<b>Horses &amp; Humans Research Foundation</b>	<b>GHETC</b>	<b>TOTAL PROJECT EXPENSES</b>
<b>Personnel</b>			
Principal Investigator (PI)	\$10,000.00	\$0.00	\$10,000.00
Statistician	\$0.00	\$15,000.00	\$15,000.00
Research Assistants	\$13,000.00	\$0.00	\$13,000.00
2 (PT) Program Riding Instructors	\$6,750.00	\$0.00	\$6,750.00
2 (PT) Riding Instructors (IT)	\$2,850.00	\$0.00	\$2,850.00
Payroll Taxes	\$1,500.00	\$0.00	\$1,500.00
Workers Compensation	\$0.00	\$3,157.00	\$3,157.00
<b>Total Personnel</b>	<b>\$34,100.00</b>	<b>\$18,157.00</b>	<b>\$52,257.00</b>
<b>Research Project Supplies &amp; Related Expenses</b>			
Administrative Expenses	\$3,785.00	\$0.00	\$3,785.00
Client Related Expenses	\$2,658.00	\$0.00	\$2,658.00
Consumable Expenses	\$457.00	\$943.00	\$1,400.00
Permanent Equipment	\$0.00	\$1,100.00	\$1,100.00
Horse Expenses	\$9,000.00	\$0.00	\$9,000.00
<b>Total Research Project Supplies &amp; Related Expenses</b>	<b>\$15,900.00</b>	<b>\$ 2,043.00</b>	<b>\$17,943.00</b>
<b>TOTAL RESEARCH PROJECT EXPENDITURES</b>	<b>\$50,000.00</b>	<b>\$20,200.00</b>	<b>\$70,200.00</b>

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**Research Project:** The Effects of Equine Assisted Activities on Social Functioning in Children with Autism

**Biographical Sketch of Principal Investigator & Study Statistician**

<b>Name: Margaret M. Bass, Ph.D.</b>	<b>Position Title: Principal Investigator</b>
<b>Education/Training</b>	

<b>Institution and Location</b>	<b>Degree</b>	<b>Year(s)</b>	<b>Field of Study</b>
Radford University Radford, Virginia	B.S.	1990	Management/Recreation
Barry University Miami Shores, Florida	M.S.	1993	Exceptional Student Education
Union Institute & University Cincinnati, Ohio	Ph.D.	2001	Special Education/ Administration

**Employment/ Experience:**

**Instructional:**

March 1994 to December 1999  
Riviera Middle School  
Miami-Dade County Public Schools  
Exceptional Student Education

November 1993 to June 1995  
Miami Dade County Public Schools  
Exceptional Student Education teacher  
Homestead, Florida

October 1990 to November 1993  
Montanari Residential Treatment Center  
Recreation Specialist  
Hialeah, Florida

**Administrative:**

December 1999 to present  
Good Hope Equestrian Training Center (GHETC)  
Executive Director  
Miami, Florida

June 1994 to March 1995  
Miami “Mega-City” Special Olympics  
Miami-Dade County Public Schools  
Director of Sports Training & Competition

**Certifications:** Mentally Handicapped K-12  
Educational Leadership  
North American Riding for the Handicapped Registered Instructor  
MDCPS Clinical Educator’s Certificate

**Presentations:** North American Riding for the Handicapped National Conference  
November 7, 2000  
Topic: Good Hope Equestrian Training Center: The Model for Equine  
Related Adult Programs  
Bloomington, Minnesota

2000 Florida Family Care Council State Conference  
September 22, 2000  
Topic: Good Hope Equestrian Training Center: An Alternative for Adult  
Programming  
Fort Lauderdale, Florida

Florida Diagnostic Learning Resource Systems  
November 6 & 9, 1998  
Topic: The Benefits of using Cooperative Learning within your Classroom  
Miami, Florida

Florida Diagnostic Learning Resource Systems  
November 13, 1998  
Topic: Making the Connection between Classwork and Homework  
Miami, Florida

Florida International University  
April 11, 1994  
Topic: Therapeutic Horseback Riding: An Overview  
Miami, Florida

Saint Thomas University  
August 12, 1994  
Topic: Miami “Mega-City Special Olympics:  
Exploring the Program Goals & Internship Opportunities  
North Miami, Florida

**Research Project:** **GHETC & University of Miami CARD Center**  
August 2006 – April 2007  
Pilot Project Name: Endless Strides

Topic: This pilot study examined the effects of therapeutic horseback riding on the sensory domains of children diagnosed with Autistic Spectrum Disorders  
Miami, Florida

<b>Name: Maria Llabre, Ph.D.</b>		<b>Position Title: Statistician</b>	
<b>Education/Training</b>			
<b>Institution and Location</b>	<b>Degree</b>	<b>Year(s)</b>	<b>Field of Study</b>
University of Florida Gainesville, Florida	B.A.	1973	Psychology and Mathematics
University of Florida Gainesville, Florida	M.A.E.	1976	Educational Psychology
University of Florida Gainesville, Florida	Ph.D.	1978	Educational Research; outside field, Statistics

**Employment/ Experience:**

- Instructional:** 1994 – present, Professor of Psychology  
University of Miami, Coral Gables, FL
- 1988 - 1994 Associate Professor of Psychology  
University of Miami, Coral Gables, FL
- 1984 - 1988 Associate Professor of Educational Psychology  
University of Miami, Coral Gables, FL
- 1978 – 1984 Assistant Professor of Educational Psychology  
University of Miami, Coral Gables, FL
- 1973 - 1974 Mathematics Teacher  
John F. Kennedy Junior High School, Miami, FL
- Visiting Professor, Kuwait University, Spring 2005
- Administrative:** 2000-present Director of Biobehavioral Statistics Behavioral Medicine Research Center
- 1993 - 1998 Master, Mahoney Residential College

**Editorial:**

2005-2008

Statistics Editor, Psychosomatic Medicine

Ad hoc reviewer for:

Health Psychology

Psychophysiology

Journal for Research in Mathematics Education

Journal of Educational Measurement

Annals of Biomedical Engineering

Behavior Research Methods, Instruments, & Computers

International Journal of Behavioral Medicine

Applied Measurement in Education

Educational Measurement Theory and Practice

Ambulatory Monitoring

Journal of Psychophysiology

Psychosomatic Medicine

International Journal of Psychophysiology

Journal of Clinical Child Psychology

Journal of Traumatic Stress

Journal of Consulting and Clinical Psychology

Journal of Personality and Social Psychology

Psychology and Health

AIDS and Behavior

**Study Section:** 1992 - 1996 Behavioral Medicine Study Section  
member, NIH, DRG

2001 - 2004 Biobehavioral and Behavioral Processes  
Study Section member, NIH

Ad hoc reviewer - Special Emphasis Panels, July 1993, 1998, October 2001, November 2001, July 2003, November 2003, February 2005, February 2006, February 2007

**Publications:**

Hurwitz, B.E., Klaus, J.R., Llabre, M.M., et al (2007) Suppression of human immunodeficiency virus type I viral load with selenium supplementation. Archives of Internal Medicine, 167, 148-154.

Hurwitz, B.E., Llabre, M.M. Selenium Effects on HIV RNA and CD4 Cell Counts: Author reply. (2007). *Archives of Internal Medicine*. 167(14), 1557.

Siegel, S.D., Molton, I., Penedo, F.J., Llabre, M.M., Kinsinger, D.P., Traeger, L., Schneiderman, N., & Antoni, M.H. (2007). Interpersonal sensitivity, partner support, patient-physician communication, and sexual functioning in men recovering from prostate carcinoma. *Journal of Personality Assessment*. 89, 1-8.

Gonzalez, J., Penedo, F., Llabre, M.M., Duran, R., & Antoni, M.(2007). Physical symptoms, beliefs about medications, negative mood, and long-term HIV medication adherence. *Annals of Behavioral Medicine*.34, 46-55.

Cugnetto, M.L., Saab, P., Llabre, M., Goldberg, R., McCalla, J., & Schneiderman, N (2007). Lifestyle Factors, Body Mass Index, and Lipid Profile in Adolescents. *Journal of Pediatric Psychology*

Llabre, M.M., Weaver, K., Duran, R., Antoni, M., McPhearson-Baker, S., & Schneiderman, N. (2006). A Measurement Model of Medication Adherence to Highly Active Antiretroviral Therapy and its Relation to Viral Load in HIV+ Adults. *AIDS Patient Care and STD's*, 20, 701-711

Hadi, F., Llabre, M.M., & Spitzer, S. (2006). Gulf War-related trauma and psychological distress of Kuwaiti children and their mothers. *Journal of Traumatic Stress*, 19, 653-662.

Shen, B.J., Goldberg, R.B., Llabre, M.M., & Schneiderman, N. (2006). Is the factor structure of the metabolic syndrome comparable between men and women and across three ethnic groups: The Miami Community Health Study. *Annals of Epidemiology*, 16(2), 131-137.

Paredes, J., Szeto, A., Levine, J.E., Zaias, J., Gonzales, J., Mendez, A.J., Llabre, M.M., Schneiderman, N., and McCabe, P.M. (2006) Social environment influences hypothalamic oxytocin in the WHHL rabbit. *Psychoneuroendocrinology*, 31, 1062-1075.

Hurwitz, B.E., Klaus, J.R., Llabre, M.M., Gonzalez, A., Lawrence, P.J., Maher, K.J., Greeson, J.M., Baum, M.K., Shor-Posner, G., Skyler, J.S., & Schneiderman, N. (in press). Selenium Supplementation Suppresses HIV Viral Load: a randomized controlled trial. *Archives of Internal Medicine*.

Siegel, S.D., Molton, I., Penedo, F.J., Llabre, M.M., Kinsinger, D.P., Traeger, L., Schneiderman, N., & Antoni, M.H. (in press). Interpersonal sensitivity, partner support, patient-physician communication, and sexual functioning in men recovering from prostate carcinoma. *Journal of Personality Assessment*.

Weaver, K.E., Llabre, M.M., Durán, R.E., Antoni, M.H., Ironson, G., Penedo, F.J., Schneiderman, N. (2005) A Stress and Coping Model of Medication Adherence and Viral Load in HIV+ Men and Women on Highly Active Antiretroviral Therapy (HAART). *Health Psychology*, 24, 385-392.

Kline, K. A., Saab, P. G., & Llabre, M. M. (2005) Behavioral indices of threat and challenge in adolescents and hemodynamic responses during a speech stressor. *International Journal of Behavioral Medicine*. 55, 343-348.

Gonzales, J., Szeto, A., Paredes, J., Zaias, J., Mendez, A., Llabre, M., Goldberg, R., & Schneiderman, N. McCabe, P.(2005). Effect of behavioral interventions on insulin sensitivity and atherosclerosis in the Watanabe Heritable Hyperlipidemic rabbit. *Psychosomatic Medicine*. 67, 172-178.

Llabre, M.M., Spitzer, S., Siegel, S., Saab, P.G., & Schneiderman, N. (2004). Applying latent growth curve modeling to the investigation of individual differences in cardiovascular recovery

from stress. Psychosomatic Medicine (Statistics Corner), 66, 29-41.

Hurwitz, B.E., Klimas, N.G., Llabre, M.M., Maher, K.J., Skyler, J.S., Bilsker, M.S., McPherson-Baker, S., Lawrence, P.J., Baez-Garcia, C., Gonzalez, N., LaPerriere, A.R., Greeson, J.M., Klaus, J., & Schneiderman, N. (2004). HIV, Metabolic Syndrome X, Inflammation, Oxidative Stress, and Coronary Heart Disease Risk: Role of Protease Inhibitor Exposure. Cardiovascular Toxicology, 4, 203-215.

Suarez, E.C., Saab, P.G., Llabre, M.M., Kuhn, C.M., & Zimmerman, E. (2004) Ethnicity, gender, and age effects on adrenoreceptors and physiological responses to emotional stress. Psychophysiology, 41, 450-460.

Motivala, S.J., Hurwitz, B.E., Llabre, M.M., Klimas, N.G., Fletcher, M.A., Antoni, M.H., LeBlanc, W.G., & Schneiderman, N. (2003). Psychological distress is associated with decreased memory T-helper and B-cell counts in pre-AIDS HIV seropositive men and women but only in those with low viral load. Psychosomatic Medicine, 65(4), 627-635.

Fernander, A.F., Duran, R.E.F., Saab, P.G., Llabre, M.M., & Schneiderman, N. (2003). Assessing the reliability and validity of the John Henry Active Coping Scale in an urban sample of African Americans and white Americans. Ethnicity and Health, 8 (2), 147-161.

Kline, K. A., Saab, P. G., Llabre, M. M., Spitzer, S. B., Evans, J. D., Green McDonald, P. A., & Schneiderman, N. (2002). Hemodynamic response patterns: Responder type differences in reactivity and recovery. Psychophysiology, 39, 739-746.

Llabre, M.M., Spitzer, S.B., Saab, P.G., & Schneiderman, N. (2001). Piecewise latent growth curve modeling of systolic blood pressure reactivity and recovery from the cold pressor test. Psychophysiology, 38, 951-960.

Lanz, M.J., Eisenlohr, C., Llabre, M.M., Toledo, Y., & Lanz, M.A. (2001). The effect of low-dose inhaled fluticasone propionate on exhaled nitric oxide in asthmatic patients and comparison with oral zafirlukast. Annals of Allergy, Asthma & Immunology, 87, 283-288.

Goldstein, R., Hurwitz, B., Llabre, M., Schneiderman, N., Gutt, M., Skyler, J., Prineas, R.J., & Donahue, R. (2001). Modeling preclinical cardiovascular risk for use in epidemiological studies: The Miami Community Health Study, American Journal of Epidemiology, 154, 765-776.

Levin, B.E., Katzen, H.L., Klein, B.K. & Llabre, M.M. (2000). Ascertainment bias in longitudinal studies of patients with Parkinson's disease. Journal of Clinical and Experimental Neuropsychology 22, 580-586.

Saab, P. G., Llabre, M. M., Ma, M., DiLillo, V., McCalla, J., Fernander-Scott, A., Copen, R., Gellman, M., & Schneiderman, N. (2001). Cardiovascular responsivity to stress in adolescents with and without persistently elevated blood pressure. Journal of Hypertension, 19, 21-27.

Klein B., Levin B., Llabre M., & Duchowny, M. (2000) Cognitive outcome of children with epilepsy and malformations of cortical development. Neurology ,55(2), 230-235.