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Parent Perceptions of the Effectiveness of Therapeutic Horseback Riding for Children with Varying Disabilities

Anita L. Scialli
Lynn University

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PARENT PERCEPTIONS OF THE EFFECTIVENESS OF THERAPEUTIC HORSEBACK RIDING FOR CHILDREN WITH VARYING DISABILITIES

DISSERTATION
Presented in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy
Lynn University

By
Anita L. Scialli

Lynn University
2002
PARENT PERCEPTIONS OF THE EFFECTIVENESS OF THERAPEUTIC HORSEBACK RIDING FOR CHILDREN WITH VARYING DISABILITIES

By Scialli, Anita L., Ph.D.

Lynn University, 2002

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ABSTRACT

Parent Perceptions of the Effectiveness of Therapeutic Horseback Riding for Children with Varying Disabilities

By Anita L. Scialli

April, 2002

Disabilities affect 54 million people and 4.4 million children in the U.S. and are of importance to special education faculty (Center for Disease Control, 2000). A survey design examines the effectiveness of human-animal interaction, specifically horseback riding, in children with varying disabilities.

Therapeutic horseback riding as an animal assisted therapy, aims to promote mind and body integration through movement (psychomotricity) and the human-animal bond (Delta Society, 2001a; Spink, 1993, All, Loving & Crane, 1999). Effectiveness is measured by parent assessment of improvement in 67 child behaviors resulting from child participation in horseback riding, using a new Horseback Riding Survey. Behaviors are organized in five Likert subscales, Self-Care, Cognitive/School Learning, Physical-Motor, Psychological/Emotional, and Social Communication/ Interaction. Internal consistency of each subscale is good using Coefficient Alpha and Split-Half tests for reliability. Criterion-related validity is established with 49 significant correlations of subscale behaviors with a single-item measure of overall horseback riding effectiveness.

A convenience sample consists of 64 parents of children aged 4-19, with varying disabilities participating in six therapeutic horseback riding facilities in south Florida. The average child’s age is 10.7 years, and of white or Hispanic background. Parents
report 75% of children have more than one disability, with disability prevalence rates of 30% or higher in: learning, speech and language, mental retardation, orthopedic impairments, autism, and developmental delay.

Using one-sample t-tests, all behaviors on the subscales show improvement since beginning horseback riding with 27 behaviors significantly higher than a score of 3.5 (range 1-5). Behaviors with the greatest improvement are range of motion, mobility, balance, posture, self-esteem, self-confidence, and self-image.

Mentally retarded children usually have more disabilities than autistic children do. They show significantly greater improvements when compared with autistic children in range of motion and mobility. Physically disabled children show significantly greater improvement in self-image than autistic children. The length of time, in months, in horseback riding participation is positively associated with behavioral improvement across all subscales.

Findings support the beneficial effects of therapeutic riding in children with varying disabilities. Future studies should examine relationships identified. Therapeutic riding should be considered as an alternative therapy for children with varying disabilities.
Acknowledgments

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TABLE OF CONTENTS

Abstract iv
Acknowledgements vi
List of Tables x
List of Figures xi

CHAPTER 1: INTRODUCTION TO THE STUDY
Introduction and Background 1
Purpose 6
Definitions of Terms 7
Justification 10
Delimitation and Scope

CHAPTER 2: LITERATURE REVIEW, THEORETICAL FRAMEWORK, AND RESEARCH QUESTIONS
Introduction 15
Literature Review 16
Disability: An Overview 16
Global Perspectives: Children with Disabilities 20
U.S. Legislation in Civil Rights, Rehabilitation, ADA and Special Education 23
Multiple Typologies of Functioning and Disability 35
Coping and Adaptation to Disability and Applications in Special Education 45
Special Education 50
Human-Animal Interaction 52
Horseback Riding 60
Theoretical Framework for the Study 72
Contextual - Biopsychosocial Model 73
Contextual-Environmental Interaction: Human-Animal Bond, Therapeutic Horseback Riding, and Psychomotricity 74
Research Questions 80

CHAPTER 3: RESEARCH METHODOLOGY
Research Design 81
Population and Sampling Plan 82
Instrumentation 95
Procedures: Ethical Considerations and Data Collection Methods 108
Evaluation of Ethical Aspects of the Study 110
Methods of Data Collection 111
Evaluation of Research Methods 111
# TABLE OF CONTENTS

## CHAPTER 4: RESULTS

<table>
<thead>
<tr>
<th>Research Question 1</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Factors: Demographic Background of the Sample</td>
<td>114</td>
</tr>
<tr>
<td>Personal Factors: Disabilities or Impairments</td>
<td>114</td>
</tr>
<tr>
<td>Environmental Factors: Therapeutic Horseback Riding</td>
<td>116</td>
</tr>
<tr>
<td>Summary</td>
<td>119</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research Question 2</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness: Self-Care/Independence Behaviors Improved</td>
<td>124</td>
</tr>
<tr>
<td>Effectiveness: Physical-Motor Behaviors Improved</td>
<td>124</td>
</tr>
<tr>
<td>Effectiveness: Psychological/Emotional Behaviors Improved</td>
<td>127</td>
</tr>
<tr>
<td>Effectiveness: Cognitive/School Learning Behaviors Improved</td>
<td>129</td>
</tr>
<tr>
<td>Effectiveness: Social Communication / Interaction Behaviors Improved</td>
<td>131</td>
</tr>
<tr>
<td>Overall Effectiveness Rating</td>
<td>133</td>
</tr>
<tr>
<td>Parent Comments in Response to Three Open Ended Questions</td>
<td>135</td>
</tr>
<tr>
<td>Summary</td>
<td>139</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research Question 3</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparisons of Effectiveness According to Demographic Variables</td>
<td>140</td>
</tr>
<tr>
<td>Comparisons of Horseback Riding Information and Effectiveness According to Disability</td>
<td>142</td>
</tr>
<tr>
<td>Relationship Between Length and Hours of Participation and Parent Perceptions of Effectiveness of Therapeutic Horseback Riding</td>
<td>146</td>
</tr>
<tr>
<td>Summary</td>
<td>150</td>
</tr>
</tbody>
</table>

## CHAPTER 5: DISCUSSION

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>151</td>
</tr>
<tr>
<td>Interpretations</td>
<td>152</td>
</tr>
<tr>
<td>Limitations</td>
<td>165</td>
</tr>
<tr>
<td>Practical Implications</td>
<td>166</td>
</tr>
<tr>
<td>Recommendations</td>
<td>169</td>
</tr>
<tr>
<td>Conclusions</td>
<td>172</td>
</tr>
</tbody>
</table>

## REFERENCES

173

## BIBLIOGRAPHY

190

## APPENDICES

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix A: Horseback Riding Survey</td>
<td>194</td>
</tr>
<tr>
<td>Appendix B: Institutional Review Board Approval and Consent</td>
<td>198</td>
</tr>
</tbody>
</table>

## VITA

203
LIST OF TABLES

1. Number of Students Ages 6 Through 21 Served Under IDEA in the 1989-90 and 1998-99 School Years


3. Number and Percentage of Students Receiving Selected Special Education and Related Services, by Type of Services Received and Number of Disabilities

4. Eligible NARHA Certified Horseback Riding Facilities Meeting Criteria from Each of the Three Southeast Florida Counties, Number Agreeing to Participate and Potential Sample

5. Response Rates Leading to the Data Producing Sample

6. Split-Half Reliability Estimates for Total Scale and Subscales for the Measure of Behavioral Effectiveness

7. Demographics of Children Participants in Therapeutic Riding by Gender, Ethnicity and Age

8. Disabilities or Impairments of Children Participants in Therapeutic Riding According to IDEA Disability Categories with IDEA Comparisons

9. Disabilities or Impairments of Children Participants in Therapeutic Riding According to Three and Two Group Disability Categories (N=64)

10. Primary Way Parent Learned About Therapeutic Horseback Riding

11. Reasons for Participation in Therapeutic Horseback Riding N=64

12. Source of Financing Therapeutic Horseback Riding and Percent Contribution from Each Source

13. Time in Participation in Horseback Riding: Number of Months and Hours Per Week

14. Child’s Interest in Participating Horseback Riding

15. Parent Perception of Effectiveness in Improved Self-Care/Independence Behaviors: Frequency Distributions, Means, Total Score, and One-Sample t-tests N=56-60
### LIST OF TABLES

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>128</td>
<td>16 Parent Perception of Effectiveness in Physical-Motor Behaviors: Frequency Distributions, Means, Total Score, and One-Sample t-tests N=(58-64)</td>
</tr>
<tr>
<td>130</td>
<td>17 Parent Perception of Effectiveness in Psychological/Emotional Behaviors: Frequency Distributions, Means, Total Score, and One-Sample t-tests N=56-61</td>
</tr>
<tr>
<td>132</td>
<td>18 Parent Perception of Effectiveness in Cognitive Behaviors/School Learning: Frequency Distributions, Means, Total Score, and One-Sample t-tests N=59</td>
</tr>
<tr>
<td>134</td>
<td>19 Parent Perception of Effectiveness in Social Communication Interactions: Frequency Distributions, Means, Total Score, and One-Sample t-tests N=(55-61)</td>
</tr>
<tr>
<td>135</td>
<td>20 Overall Parent Rating of Effectiveness of Therapeutic Riding Between 0 – 100</td>
</tr>
<tr>
<td>141</td>
<td>21 Comparisons of Horseback Riding Information and Effectiveness by Gender: Significant Independent t-test Results (p=&lt;.05)</td>
</tr>
<tr>
<td>143</td>
<td>22 ANOVA and Post Hoc Comparisons of Significant Differences in Horseback Riding Information and Number of Disabilities According to Disability Category: Autism (N=27), Physical Disability (N=22), and Mental Retardation (N=15)</td>
</tr>
<tr>
<td>145</td>
<td>23 ANOVA and Post Hoc Comparisons of Significant Differences in Effectiveness According to Disability Category: Autism (N=27), Physical Disability (N=22), and Mental Retardation (N=15)</td>
</tr>
<tr>
<td>146</td>
<td>24 Significant t-Test Results of Improvement in Physical-Motor Behaviors According to a Two Group Disability Category: Physical Disability and Mental Retardation (N=37) and Autism and Emotional Disability (N=26)</td>
</tr>
<tr>
<td>148</td>
<td>25 Pearson r Correlations of Significant Relationships between Effectiveness and Length of Time in Participation in Therapeutic Riding</td>
</tr>
</tbody>
</table>

### LIST OF FIGURES

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>79</td>
<td>Fig. 1 Environmental and Personal Factors and Parenting Assessment of the Biopsychosocial Behavioral Effectiveness of Therapeutic Horseback Riding in Children with Varying Disabilities</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION TO THE STUDY

Introduction and Background

Disability is a major problem in the U.S., affecting 17.1% of the population in 1998. Over 54 million people have a disabling condition (Center for Disease Control [CDC], 2000). Newacheck and Halfon estimated that 6.5% of U.S. children experience some form of disability, affecting 4.4 million children (as cited in Trinkl, 1998). Children with varying disabilities are a major societal concern and of special importance to special education faculty.

The U.S. governmental involvement in the special needs of the disabled evolved through a series of legislative efforts that aim to protect the rights of all minority groups (Civil Rights Act CRA) and provide equal protection through the 14th amendment (Brown versus the Board of Education). The Rehabilitation Act of 1973 addressed protection against discrimination solely due to disabilities. The Americans with Disabilities Act (ADA), which passed in 1990, extended civil rights similar to those of the Civil Rights Act of 1964 to people with disabilities. It is extremely significant as "it opens the world to participation by persons with disabilities" (Kauppi, 2002, p. 7). The most significant educational legislation is the Individual's with Disabilities Education Act (IDEA), originally passed in 1975 as Public Law (PL) 94-142, the Education for All Handicapped Children Act of 1975 (EAHCA). This law requires an Individual Educational Plan (IEP). It was reauthorized in 1991 as IDEA, and amended in 1997 to include (FAPE) Free and Appropriate Public Education (FAPE) to students with
disabilities. Section 504 contributes even more to the rights of the disabled as it is the only legal mandate requiring special education agencies to provide related services to a disabled child. An important role of special education faculty is to continuously explore ways to address the special needs of children with disabilities, including those with mental retardation, autism, and physical disability problems, to enhance their adjustment in society, and maximize their capabilities. Children with disabilities often learn to adjust their comfort level by internalizing or externalizing their behavior (Skinner, Bailey, Correa, & Rodriguez, 1999). The synergistic relationship between humans and animals should be given serious consideration by special education faculty. Therapeutic horseback riding is an environmental intervention that aims to promote mind and body integration through movement (psychomotricity) and the human-animal bond (Delta Society, 2001a; Spink, 1993; All, Loving & Crane, 1999).

This study examines the effectiveness of human-animal interaction, specifically horseback riding, in children with varying disabilities. Effectiveness is assessed from the parent's perspective of improvement of child behaviors in five categories, independence-self care, physical-motor, psychological-emotional, cognitive-school, and social interaction. Behavioral improvements are indicators of adjustment to disabilities.

An environmental-biopsychosocial model serves as the theoretical basis for the assessment of effectiveness of horseback riding in children with disabilities. "Each person will adapt or adjust to disability in their way at their own time. Adjustment is seen by many as the function of the congruence between the subjective world of the person and the external environment. If the two fit well, the adjustment should be quicker and better" (Facklam, 2002, p. 1).
As a global concern, functioning and disability are explored within the newly developed *International Classification of Functioning, Disability and Health* (ICF) which integrates various perspectives of functioning through a "biopsychosocial" approach (World Health Organization [WHO], 2001a, p. 20). A person's functioning and disability is conceived as a dynamic interaction between health conditions (diseases, disorders, injuries, traumas, etc.) and contextual factors (environmental and personal factors) (p. 8).

"The ICF is the work of 65 countries, has been accepted by 191 countries as the international standard to describe and measure health and disability and is available in six languages: English, French, Spanish, Arabic, Chinese and Russian (WHO, 2001b, p. 1).

The ICF model is very consistent with emerging educational views. Special education faculty members are encouraged to view adjustment in a manner that integrates medical and behavioral models (Kollins, Barkley, & DuPaul, 2001). This integration considers that environmental or external factors are the cause of school behavior disorders (behavioral model) as well as within-child or internal factors (medical model) as the causes of school behavior disorders (Kauffman, 2001). The ICF model is also consistent with Bronfenbrenner's (1977, 1986, 1989) ecological-contextual model which is frequently applied in education. People develop in a variety of contextual environments and the constant interaction plays an important role in development.

Assessment of effectiveness should be consistent with U.S. educational standards and public laws and facilitate compliance with the many legal mandates for children with special needs. In describing the development of the Individual Education Plan (IEP), Umansky and Hooper (1998) report that "Efforts to include family members in the assessment process are ever-increasing . . . parents need to view the assessment and
intervention as consistent with their perceptions of their child" (p. 367). Parents are usually most knowledgeable about their child's behavior across time and situations. Therefore, they may be the best sources of data about children competencies (Achenbach, 1991, p. 3).

Special education researchers and practitioners should aim for development of well-standardized, psychometrically sound assessment instruments to aid in the IEP process (Harniss, Epstein, Ryser, & Pearson, 1999). Assessment instruments should be normative and criterion-referenced, culturally sensitive, non-discriminatory and non-biased, which are useful in the assessment-intervention-evaluation process (Umansky & Hooper, 1998). This lends support to Kavale (2001) who emphasizes the critical importance of an integrative model particularly in special education decisions related to functional behavioral analyses and positive behavioral intervention. For those with disabilities, contextual-environmental interventions aim to be facilitative interactions of people in their environments. One important interaction is the human-animal interaction.

Almost any type of animal can help children form strong emotional bonds (Jennings, 1997). Animal Assisted Activities (AAA) might serve as an intrinsic appeal to children. AAA can produce a calming effect on students that can help them focus on learning stimuli. Professionals are beginning to realize this can be very powerful in helping "at risk" children and children with special needs. Animals can help motivate, encourage learning, cooperation, and expression. Animals may become a stimulus for exercise, reduce anxiety and provide an external focus of attention. Animals are also a source of comfort and may decrease loneliness and depression while promoting a more interesting environment (All, et al., 1999).
Animal contact can be therapeutic (Kaufmann, 1997). The synergistic phenomena between humans and animals should be given serious consideration (Jorgenson, 1997). Animal Assisted Therapy (AAT) is a goal directed intervention in which an animal is an integral part of the treatment process. AAT aims to enhance improvement in physical, psychological, and/or cognitive functioning. It posits that communicative, psychosocial, and academic functioning of children and adolescents with a variety of disabilities can be improved by participating in AAT (Polshuck, 1997).

A specific type of animal-child interaction occurs through therapeutic horseback riding. Therapeutic horseback riding is the use of the horse and equine-oriented activities to achieve a variety of therapeutic goals, including cognitive, physical, emotional, social, educational and behavioral goals (All, et al., 1999; the North American Riding for the Handicapped Association [NARHA], 2001; Kaufmann, 1997). The value of riding stems on the relationship developed between a rider and the horse being ridden. Psychomotricity, which aims to promote mind and body integration through movement, can be applied to therapeutic riding (Spink, 1993). The therapeutic relationship experienced between the person and the horse (animal-human bond), the caring, and the effort alone helps this synergy to come together (Barwick, 1986).

In this study, horseback riding as a form of animal assisted therapy is an environmental factor. This human-animal interaction, including human-animal bonding and movement (psychomotricity) interacts with other personal factors (demographics and type of disability) which together affect biopsychosocial behaviors in children with disabilities. Improvements in these behaviors are viewed as indicators of horseback riding effectiveness.
Purpose

As a form of human-animal interaction and animal assisted therapy, horseback riding has been in existence for many years and is used for children with varying disabilities to enhance physical, mental, and social/emotional adjustment. However, the body of scientific knowledge is weak - there is little research literature that describes demographic and disability characteristics of children who participate in horseback riding, measurable indicators of the effectiveness of horseback riding, and relationships of demographic, disability and participation factors with effectiveness. As a special education teacher with experience and interest in horseback riding for children with disabilities, the opportunity is present to contribute to the body of knowledge in this field.

The expectations of this survey research are to achieve the following broad purpose: to provide descriptive and exploratory knowledge of the behavioral effectiveness of horseback riding in children with varying disabilities using a newly designed measure, The Horseback Riding Survey. Specific purposes are,

1. To describe personal factors (demographic and disability) and environmental factors (therapeutic horseback riding) of children that participate in therapeutic riding.

2. To describe parent perceptions of effectiveness of therapeutic horseback riding in children with varying disabilities.

3. To explore the relationships among demographic, disability, and therapeutic horseback riding factors and parent perceived effectiveness of therapeutic horseback riding in children with disabilities.
Definitions of Terms

The newly developed World Health Organization definitions of the ICF are used to define the variables theoretically. Contextual Factors "represent the complete background of an individual's life and living. They include two components: Personal and Environmental Factors" (WHO, 2001a, p. 16).

Personal Factors

Theoretical Definition

Personal factors are the particular background of an individual's life and living, and comprise features of the individual that are not part of a health condition or health states. "These factors may include gender, race, age, other health conditions, fitness, lifestyle, habits, upbringing, coping styles, social background, education, profession, past and current experience (past life events and concurrent events), overall behavior pattern and character style, individual psychological assets and other characteristics, all or any of which may play a role in disability at any level" (WHO, 2001a, p. 17).

Operational Definition

In this study, personal factors include demographic variables (age, gender and ethnicity/race), disability, and parent assessment of the effectiveness of horseback riding in five categories of child behaviors: (Self-Care/Independence, Physical-Motor, Psychological-Emotional, Cognitive-School and Social Interactions and Communication) and overall effectiveness. These variables are measured on the Horseback Riding Survey, developed by the researcher.
Environmental Factors

Theoretical Definition

"Environmental factors make up the physical, social and attitudinal environment in which people live and conduct their lives. These factors are external to individuals and can have a positive or negative influence on the individual’s performance as a member of society, on the individual’s capacity to execute actions or tasks, or on the individual’s body function or structure" (WHO, 2001a, p. 16). "The basic construct of the Environmental Factors component is the facilitating or hindering impact of features of the physical, social and attitudinal world" (p. 8). There are two categories of environmental factors: individual and societal.

Individual environmental factors. These factors are “in the immediate environment of the individual, including settings such as home, workplace and school. Included at this level are the physical and material features of the environment that an individual comes face to face with, as well as direct contact with others such as family, acquaintances, peers and strangers” (WHO, 2001a, p. 16).

Societal environmental factors. These factors are “the formal and informal social structures, services and overarching approaches or systems in the community or society that have an impact on individuals. This level includes organizations and services related to the work environment, community activities, government agencies, communication and transportation services, and informal social networks as well as laws, regulations, formal and informal rules, attitudes and ideologies” (WHO, 2001a, p. 17).
Operational Definition

In this study, environmental factors include participation in therapeutic horseback riding as an Animal Assisted Activity/Animal Assisted Therapy (AAAT) and background information on therapeutic horseback riding measured on the Horseback Riding Survey. Questions to parents include reason for participation, how they heard about the program, financing sources, and length of time and frequency of child participation in horseback riding. These variables are measured by questions on the Horseback Riding Survey (developed by the researcher).

Dependent, Independent, and Extraneous Variables

All variables under investigation in this study are attribute variables, pre existing characteristics that are being measured. There are no active variables created or manipulated for the study.

Dependent Variable

The dependent variable is the parent perceptions of the effectiveness of horseback riding on child behaviors (personal factors).

Independent Variables

The independent variables include personal factors of demographics, type of disability, and environmental factors of therapeutic horseback riding background information and length of time and frequency in therapeutic riding participation.

Extraneous Variables

Extraneous factors include all other environmental and personal factors that are not accounted for in this study. Examples include other therapies received, other sports,
hobbies and participatory activities, and other situational or developmental stressors that may influence behavioral change.

**Justification**

This study is justified by considering its significance, the degree to which it is researchable, and its feasibility. It is significant because it may contribute to a body of knowledge about the children with special needs, varying disabilities, behavioral characteristics, and horseback riding as a valid essential service that may be part of the IEP and adequately funded for children with any type of disability.

Although horseback riding, as therapy, has been in existence since the days of Florence Nightingale, there is little research literature to demonstrate its effectiveness. This study aims to design a tool to measure effectiveness of animal assisted therapy and specifically the effects of horseback riding. AAA and AAT are used effectively in the rehabilitation process of people with varying impairments; however, there is a paucity of research on the effects of horseback riding for those with disabilities (All, et al., 1999). Studies are primarily descriptive, “focusing on the observations and subjective reports of therapists, riding instructors, caregivers of riders and riders” (p. 53).

All, et al. (1999) identify the need to develop tools "to assess and quantify meaningful improvements in functional outcomes . . . to accurately assess the improvements that qualitative research has reported with horseback riding” (p. 55). Studies and instruments measuring changes need to be developed, especially studies with larger sample sizes. The synergistic phenomena between humans and animals need to be addressed. Future research should also explore how animals can alter perceptions to people in their environment. "Longitudinal studies that specifically address the
psychosocial benefits received from pet-assisted therapy and horseback riding are crucial" (p. 55). The amount of time in a therapeutic riding program does make a difference, and studies should really be longitudinally based. There is evidence that while upon a horse, a child's attitude, signing, taking, touching, feeling, bonding, self discipline, independence, attitude, understanding instructions, and adjustment occur and these behaviors may carry over to every day life (All, et al., 1999). This study provides a new measure of effectiveness indicators of therapeutic riding that include the recommendations of many researchers.

Because the effectiveness of horseback riding as a therapeutic intervention remains unclear, Doerkson and Bartlett (2002) of the Research Alliance for Children with Special Needs in Ontario, Canada, are currently in process of conducting a meta-analysis of the available research literature. Their study aims to provide therapists with indicators of the effectiveness of this type of intervention on variables reflecting impairment, activity, and participation. These authors will be contacted at the conclusion of this study to provide descriptive information for their meta-analysis.

This study applies new models for special education and for understanding disability and functioning. These include the integration of contextual-biopsychosocial models proposed by Bronfenbrenner (1977, 1986, 1989), Kollins et al. (2001), and the World Health Organization (2001a).

This study is significant because it addresses legal, ethical and educational mandates pertaining to those with special needs and varying disabilities. Special education faculty members continuously seek new ways to address the needs of children with disability problems, to enhance their adjustment, and maximize their potential.
Contributing to the body of knowledge about therapeutic riding may increase funding. If funding is increased, there may be more involvement of academically prepared professionals in riding programs. Currently these programs rely almost totally on volunteers. It would be better profiled if programs involve professionals, who apply scientific theory.

In addition to contributing to the body of knowledge for special education faculty and programs, this study contributes in part to the mission of the professional associations. Included are associations that aim to develop a body of knowledge in animal-human bonding, animal-human interactions, animal assisted activities, animal assisted therapy, and therapeutic horseback riding such as the Delta Society and NARHA. Fostering and supporting research and the development of knowledge and innovations to improve results for children with disabilities is the most significant justification.

The study is researchable because it asks scientific questions and has variables that can be measured. Descriptive and inferential statistics can answer the questions asked. It is feasible because it can be implemented in a reasonable amount of time, subjects are available, several horseback riding programs demonstrate interest in participation in the study, and research concepts can be measured. Statistical analyses can be performed to describe the variables under consideration, the relationships between the variables, and differences among variables. The study can be implemented at a reasonable cost. Furthermore, efforts are made to maintain appropriate ethical adequacy and subject rights will be protected.
Scope and Delimitation

1. Geographic area is limited to southeast Florida in the tri-county areas of Brossard, Dade and Palm Beach counties.

2. Horseback riding facilities where therapeutic riding occurs must be NARHA certified. This is a membership organization that fosters safe, professional, ethical and therapeutic equine activities.

3. Therapeutic riding program agrees to have parent customers participate in the study.

4. One parent must have a child with disabilities, aged 4-19. Parent in this case may be a foster parent or legal guardian.

5. Child disability (or disabilities) qualify under PL 94-142 (IDEA) or those of the State of Florida.

6. Children of the parents participate in a therapeutic riding program.

7. Parents are able to read, write and speak English.

8. Parents agree to participate in the study and to complete one survey.

The limitation in geography is a feasibility issue and of practical application in managing the survey. Those excluded from the study are parents of children under 4 and over 19, due to a desire to focus on school-aged children as well as early intervention. The measuring tool being used is for parents who read and write in English. To respond to any questions that parents may have pertaining to any aspect of the study, the parents need to speak English due to limited understanding of another language by the researcher. However, this limits sample representation because south Florida has a large Hispanic-speaking population. To protect the rights of parents, informed consent procedures are maintained. The study is limited to parents who agree to participate.
Chapter 1 introduces the study about the effectiveness of therapeutic horseback riding in children with disabilities. Included are introductions to disabilities as a United States problem, affecting 4.4 million children, the important role of special education faculty to continuously explore and evaluate interventions for these children, the critical importance of promoting environmental interventions in improving positive behavioral outcomes, and the importance of considering human-animal interaction, specifically horseback riding to achieve a variety of therapeutic goals, including cognitive, physical, emotional, social, and educational goals. Terms for this study are theoretically and operationally defined and delimitations of the study are identified. The study is justified because it is significant, researchable, and feasible. Chapter 2 presents the literature review, theoretical framework and research questions identified for this study about the behavioral effectiveness of therapeutic horseback riding in children with disabilities.
CHAPTER 2
LITERATURE REVIEW, THEORETICAL FRAMEWORK, AND
RESEARCH QUESTIONS

Introduction

Individuals with special needs are likely to be more dependent on others throughout their lives. The amount of financial and other resources justified for those with special needs depends upon the severity of a disability. Sameroff (1979) coined the term of "learned incompetence" which is the inability to break away from constant dependence of others. On-going dependence produces negative public attitudes, resulting in society not willingly supporting public funding for people that may be forever dependent. The relationship between early intervention and early childhood learning is beginning to be established for children, but success of interventions with adults is minimal (Umansky & Hooper, 1998). In 1994, Ramey and Ramey indicated "more evidence exists to support the benefits of early intervention for children at environmental risk" (cited in Umansky & Hooper, 1998, p. 9). While research to support the benefits of early intervention with biological impairments is growing, it suffers from poor methodology therapies (Umansky & Hooper, 1998). Federal funding of programs to serve children with disabilities would be more readily available if researchers could provide valid approaches to effective therapies (Umansky & Hooper, 1998). This study about children with varying disabilities who participate in therapeutic horseback riding serves as one example of an intervention that may be effective with children with disabilities. Although funding is provided for this type of therapy, the research is scant.
The literature review begins with an overview of the concept of disability, which leads into a discussion of global policies and U.S. governmental involvement pertinent to children with disabilities, with an emphasis on education. The initiatives of the World Health Organization with its newly introduced *International Classification of Functioning, Disability and Health* (ICF) and corresponding biopsychosocial model that serves as the foundation to structure the ICF is discussed. Various typologies presently used to classify disabilities at international and national levels and in special education are identified. This background provides the foundation for discussion of the various conceptual models applied to those with disabilities and the application of these models in education. The unique relationship between special education faculty and parents in working together in planning, implementing, and evaluating programs designed for the child with special needs is discussed. The role of the special education faculty in seeking new ways to improve and meet the needs of children with disabilities leads to a discussion of AAA/AAT and therapeutic horseback riding. This literature review serves to establish a theoretical framework for this study and the research questions to be answered.

**Literature Review**

*Disability: An Overview*

A major problem in the United States is disability, where an estimated age-adjusted prevalence in 1998 ranged from 13.6% (DC) to 21.8% (Alabama) and a median of 17.1%. This results in an estimated 54 million people that report disabling conditions (CDC, 2000). Estimates are that 8% of children 3-17 years of age have a learning disability, and an estimated 6% of children had Attention Deficit Disorder (Bloom &
Tonthat, 2002). On its web page, http://www.cdc.gov/ncbddd/dd/default.htm, the National Center on Birth Defects and Developmental Disabilities (CDC, n.d., National Center) reports similar rates with 17% of U.S. children under 18 years of age have a developmental disability. "Developmental disabilities are a diverse group of physical, cognitive, psychological, sensory, and speech impairments that begin anytime during development up to 18 years of age. Approximately 2% of school-aged children in the U.S. have a serious developmental disability, such as mental retardation or cerebral palsy, and need special education services or supportive care. State and federal education departments spend about $36 billion each year on special education programs for individuals with developmental disabilities who are 3-21 years old” (p.1). In the State of Florida alone it is estimated that 340,000 students with disabilities are enrolled in public schools in 2001-2002 (School Choice, Inc. 2001).

From October 1991 through January 1992, the Survey of Income and Program Participation was conducted about disabilities. The sample consisted of U.S. civilian, non institutionalized personal household interviews (n = 97,133 persons in 34,100 households non institutionalized population. The World Health Organization's International Classification of Impairments, Disabilities, and Handicaps is used to define and measure disability. Results for 1991-1992, indicate an estimated 48.9 million persons (19.4% of the total U.S. population of 251.8 million) had a disability. These include 3.8 million (7.9%) for those 17 years or younger. The estimated prevalence of disabilities for other age groups were children less than 3 years old, 2.2%; 3-5 years, 5.2%, 6-14 years, 6.3%; and 15-17 years, 9.3%. The prevalence of disabilities in boys is
higher than girls in all age groups, and greatest in the 6-14 year old age group (CDC, 1995).

In 1998, Paul Newacheck and Neal Halfon conducted a study that is published in the *American Journal of Public Health on the Prevalence and Impact of Disabling Chronic Conditions*. A UCFS Press Release summarized findings of the study (Trinkl, 1998). The researchers analyzed data from the National Health Interview Survey with an estimated 6.5% of children experiencing some degree of disability (4.4 million U.S. children). Study findings further indicated that there were significantly higher prevalence rates of disability in children from poor families, older children, boys, and children from single-parent households. The major types of conditions, disorders or illness causing disabilities were, respiratory diseases, impairments of speech and intelligence (principally mental retardation), and mental and nervous system disorders. While there are variations in measurement of disabilities, disability is a global problem and commonalities are noted in how the term and its related concepts are defined.

The *Standard Rules on the Equalization of Opportunities for Persons with Disabilities* approved by the United Nations (1994) describes disability and handicap:

The term "disability" summarizes a great number of different functional limitations occurring in any population in any country of the world. People may be disabled by physical, intellectual or sensory impairment, medical conditions or mental illness. Such impairments, conditions or illnesses may be permanent or transitory in nature. (p. 6)

"Handicap" means the loss or limitation of opportunities to take part in the life of the community on an equal level with others. It describes the encounter between the person with a disability and the environment. The purpose of this term is to emphasize the focus on the shortcomings in the environment and in many organized activities in society, for example, information, communication and
education, which prevent persons with disabilities from participating on equal terms. (p. 6)

Definitions of disability and handicap developed by the United Nations are consistent with Feingold & Feingold (1984), U.S. policy and current literature today. For example, Feingold and Feingold characterize a disability as a long term or constant condition caused by inherited, congenital, or traumatic injury, illness or disease to anatomical body structures or functions or emotional situations (1984). A disability with respect to an individual "is a physical or mental impairment that substantially limits one or more of the major life activities of such individual" (U. S. Code, n.d., Title 42, Chapter 42, Sec. 12102, p. 1). Facklam (2002) defines a disability "to describe a restriction or lack of ability to perform an activity in the manner or within the range considered normal for a person. These restrictions could include such things as sitting, limited memory, inability to walk, difficulty in speaking, difficult or inability to hear, etc" (p. 1).

"Handicap is defined as a disadvantage compelled on an individual by the society, environment, or economy that results from an impairment or disability" (Facklam, 2002, p. 1). The limitation for a disabled person is the handicap caused by physical and mental barriers in the environment, in the disabled individual's path (Thompson, 1996). "Each person will adapt or adjust to disability in their way at their own time. Adjustment is seen by many as the function of the congruence between the subjective world of the person and the external environment. If the two fit well, the adjustment should be quicker and better. Additionally, adjustment can be looked at as a process of a succession of situations requiring specific solutions" (Facklam, 2002, p. 1).
In his "Universal Manifesto" for early childhood intervention, Simeonsson (2000) identifies beliefs that are accepted universally and internationally in areas of theory and developmental science and policy. Intervention, particularly during the first few years of life, can reduce manifestations of disability. Simeonsson advocates Bronfenbrenner's frequently used contextual model which emphasizes the micro, meso and macro levels of the child's environment in early intervention programs and service provisions.


Simeonsson further emphasizes Article 23 of the United Nations Convention, which recognizes the importance of children and their unique needs and disabilities. The
four paragraphs in Article 23 are responsibilities for nation-States (United Nations, 1989):

1. States Parties recognize that a mentally or physically disabled child should enjoy a full and decent life, in conditions that ensure dignity, promote self-reliance and facilitate the child's active participation in the community.

2. States Parties recognize the right of the disabled child to special care and shall encourage and ensure the extension, subject to available resources, to the eligible child and those responsible for his or her care, of assistance for which application is made and which is appropriate to the child's condition and to the circumstances of the parents or others caring for the child.

3. Recognizing the special needs of a disabled child, assistance extended in accordance with paragraph 2 of the present article shall be provided free of charge, whenever possible, taking into account the financial resources of the parents or others caring for the child, and shall be designed to ensure that the disabled child has effective access to and receives education, training, health care services, rehabilitation services, preparation for employment and recreation opportunities in a manner conducive to the child's achieving the fullest possible social integration and individual development, including his or her cultural and spiritual development.

4. States Parties shall promote, in the spirit of international cooperation, the exchange of appropriate information in the field of preventive health care and of medical, psychological and functional treatment of disabled children, including dissemination of and access to information concerning methods of rehabilitation, education and vocational services, with the aim of enabling States Parties to improve their capabilities and skills and to widen their experience in these areas. In this regard, particular account shall be taken of the needs of developing countries. (p. 8)
Simeonsson emphasizes the role of parents as a central factor in influencing policy through advocacy efforts and development of services at the grassroots level. Further review of the *United Nations Convention on the Rights of the Child*, General Assembly resolution 44/25 (United Nations, 1989) addresses this responsibility in Article 27:

Every child has the right to a standard of living adequate for his or her physical, mental, spiritual, moral and social development. Parents have the primary responsibility to ensure that this responsibility can be fulfilled, and is. State responsibility can include material assistance to parents and their children. (p. 8)

Simeonsson explains how the needs of the disabled cover the lifespan and should be addressed at all levels of community involvement. Community based services for people with disabilities, and advocacy for access to these services are addressed in the *U.N. Standard Rules for the Equalization of Opportunity and the WHO edict on Community Based Rehabilitation (CBR)*. The *U.N. Standard Rules for the Equalization of Opportunity* (1994), consists of 22 rules, and their purposes are summarized in the preamble:

1. To stress that all action in the field of disability presupposes adequate knowledge and experience of the conditions and special needs of persons with disabilities;
2. To emphasize that the process through which every aspect of societal organization is made accessible to all is a basic objective of socio-economic development;
3. To outline crucial aspects of social policies in the field of disability, including, as appropriate, the active encouragement of technical and economic cooperation;
4. To provide models for the political decision-making process required for the attainment of equal opportunities, bearing in mind the widely differing technical and economic levels, the fact that the process must reflect keen understanding of
the cultural context within which it takes place and the crucial role of persons with disabilities in it;

5. To propose national mechanisms for close collaboration among States, the organs of the United Nations system, other intergovernmental bodies and organizations of persons with disabilities;

6. To propose an effective machinery for monitoring the process by which States seek to attain the equalization of opportunities for persons with disabilities. (pp. 7-9)

The World Health Organization provides significant global leadership in addressing the needs of the disabled, apparent with its numerous publications that are available through its web site (www.who.org). Publications on rehabilitation, international classification of functioning and disability, disability prevention, legal aspects of the disabled and promoting development of young children with disabilities are available on the web site http://www.who.int/dsa/cat98/rehab8.htm#ICIDH-2. World emphasis on children with disabilities is evident, and an area of global concern.

United States Legislation in Civil Rights, Rehabilitation, ADA and

Special Education

The year 1864 marks the entry of the U.S. federal government into evolving a commitment to children with special needs, with the establishment of Gallaudet College for the Deaf (Umanski & Hooper, 1998). Little was done until 1917 with the Smith-Hughes Act, which established the Federal Board for Vocational Education. Under this act, in 1918, the Smith-Sears Bill provided for vocational rehabilitation for disabled service members and in 1920 the Smith-Fess act made civilians eligible for vocational rehabilitation Kauppi (2002). From 1864, with the establishment of Gallaudet College for the Deaf until more than 60 years later, in 1930, that the government again addressed
the special needs of children. This was done by establishing a Section on Exceptional Children and Youth in the Office of Education of the Department of Health, Education and Welfare (Umanski & Hooper, 1998).

While not directly related to education for children with disabilities, implications of the Brown v. Board of Education decisions subsequently affected inclusion of all students in public school systems. "On May 17, 1954, U.S. Supreme Court Justice Earl Warren delivered the unanimous ruling in the landmark civil rights case Brown v. Board of Education of Topeka, Kansas. State-sanctioned segregation of public schools was a violation of the 14th Amendment and was therefore unconstitutional. This historic decision marked the end of the 'separate but equal' precedent set by the Supreme Court nearly 60 years earlier and served as a catalyst for the expanding civil rights movement during the decade of the 1960s" (National Archives and Records Administration, 1999, p. 2). Chief Justice Earl Warren believed that feelings of an inferiority status evolve through separation and exclusion, which in turn affects lifelong motivation to learn (National Archives and Records Administration, 1999, p. 2).

Until the 1960's, education for children with special needs remained predominantly a state or local concern (Fischer, Schimmel, & Kelly, 1999). Many disabled children were institutionalized. The Civil Rights Act (CRA), passed in 1964, protects the rights of all "minority groups". The CRA of 1991 (Pub. L. 102-166, CRA) amends several sections of Title VII (U. S. Equal Employment Opportunity Commission, 1997, p. 1). The special education implications of the CRA act are that "Access should not be denied based on disability or any characteristic alone. Children with disabilities have a right to go to the same schools and classes as their friends, neighbors, brothers and
sisters. They have a right to be afforded equal opportunities" (Kids Together, Inc. n.d., p. 1).

In 1965, the Elementary and Secondary Education Act signaled a dramatic turn in federal support of education. There was significant funding of schools to serve children aged 3-21 that were disabled or educationally disadvantaged. The Bureau of Education for the Handicapped was established, and funding for research and demonstration projects that focused on special education services became available (Umanski & Hooper, 1998).

In 1968, the Handicapped Children's Early Education Assistance Act initiated the importance of early childhood education. It established the Handicapped Children's Early Education Program that has since been renamed the Early Education Program for Children with Disabilities, funding exemplary model programs. Two landmark Federal court decisions in 1971 and 1972 followed: Pennsylvania Association for Retarded Children v. Commonwealth of Pennsylvania in 1971 and Mills v. Board of Education of the District of Columbia the following year, established that “the responsibility of States and local school districts to educate individuals with disabilities is derived from the equal protection clause of the Fourteenth Amendment of the United States Constitution” (1995a, p. 1, cited in Office of Special Education Programs [OSEP], 2000a, p. v).

Other early intervention legislation included the Economic Opportunity and Community Partnership Act of 1974, which required Head Start programs to provide services to at least 10% of children with disabilities. "In 1994 and 1995, more than 98,000 children with disabilities were served in Head Start programs" (Umanski & Hooper, 1998, p. 3).
In 1973, Section 504 of the Rehabilitation Act was enacted. This historic legislation stated: "No otherwise qualified individual with disabilities in the United States... shall solely by reason of his disabilities, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program, or activity receiving Federal financial assistance..." (U. S. Code, n.d., Section 504).

The Education of the Handicapped Act of 1974 mandated that States without conflicting laws were to establish a plan to identify and serve all children with disabilities from birth to 21 years of age. This philosophy was included in the subsequent PL 94-142, the Education for All Handicapped Children Act of 1975 (EAHCA). In 1991, Congress reauthorized funds for PL 94-142 under the Individuals with Disabilities Education Act more commonly referred to as "IDEA" (Umansky & Hooper, 1998).

PL 94-142 set the standards that children be first identified, as early as preschool, and once identified, receive a comprehensive assessment, then placed appropriately. Parents have the right to be informed of placement and challenge it if they deem necessary. The assessment process must be completed every three years, and an Individualized Education Program (IEP) confirming the educational plan is reviewed annually. Special classes and separate schools can be used only when the nature or severity of the child’s disability prohibits education in a more normal setting (Umansky & Hooper 1999).

The Americans With Disabilities Act (ADA), enacted in 1990, has deep roots in Section 504 of the 1973 Rehabilitation Act. In many ways, the ADA is Section 504 (Rosenfeld, n.d.). Findings of the Congress were: "some 43,000,000 Americans have one or more physical or mental disabilities, and this number is increasing as the population as
education and related services a student in special education receives are delineated in, and provided in conformity with the IEP. The IEP was developed to enrich and improve lives for children with disabilities. They are all different, each reflecting goals through tiny steps beginning with the capability and building on that. The IEP will be carefully scrutinized in litigation involving the determination of a FAPE” (Yell & Drasgow, 2000, p. 205).

On the EDLAW, Inc website, Rosenfeld (n.d.) emphasizes the importance of educators and parents of children with disabilities being familiar with both IDEA and Section 504 of the Rehabilitation Act in order to secure a free and appropriate education (FAPE). Although almost 30 years old, it was not until recent years that Section 504 began receiving attention in schools. Section 504 has a broader interpretation of disability than IDEA. Generally not all students covered by Section 504 are eligible under IDEA, and conversely students that are covered by IDEA are also eligible for services under Section 504. Thus, Section 504 may be a more important legal mandate requiring schools to provide special education or related services for children with disability. Furthermore, Section 504 is broader than IDEA regarding the scope of special or regular education and related services reflective of FAPE. FAPE is used in both statutes.

Furthermore, the ADA made revisions that are even more positive for the disabled. While Section 504 applies only to organizations that receive federal funding, the ADA has a much broader context. There are similarities regarding education. The ADA and Section 504 are administered by the Office of Civil Rights. Responsibilities of this office are (Office of Civil Rights, n.d.)
a whole is growing older; . . . historically, society has tended to isolate and segregate individuals with disabilities, and, despite some improvements, such forms of discrimination against individuals with disabilities continue to be a serious and pervasive social problem. The purpose [of the Act] is to establish a clear and comprehensive prohibition of discrimination on the basis of disability" (U. S. Code, n.d., The Americans with Disabilities Act of 1990, pp. 1-2).

The ADA aim was to enable those with disabilities to participate in the mainstream of life. It encouraged the disabled and employers to make as much of a contribution to society as possible, so they do not have to live such isolated and dependent lives. Discrimination against the disabled is prohibited in public and private sectors, regardless of funding sources (ACM, 2001). Employers may not discriminate in hiring or promotion, and must provide reasonable accommodations. Those operating public accommodations such as restaurants, hotels, and stores must not discriminate, and must provide services or access telephone relay services must be established. "The law states that associations and companies become public accommodations when they lease space for a meeting, convention, or trade show" (ACM, 2001, p. 1).

IDEA was amended and reauthorized again in 1997 as IDEA '97' (Yell & Drasgow, 2000, p. 205). "Educators have been charged with the responsibility for developing and delivering a free appropriate public education (FAPE) to students with disabilities. A FAPE is a publicly funded and individually designed educational program developed to meet the unique needs of eligible students with disabilities" (Yell & Drasgow, 2000, p. 205). The FAPE is defined for a student by a staff-parent collaborative process in design of the IEP (Yell & Drasgow, 2000). "The special
The Office for Civil Rights enforces five Federal statutes that prohibit discrimination in education programs and activities that receive Federal financial assistance. Discrimination on the basis of race, color, and national origin is prohibited by Title VI of the Civil Rights Act of 1964; sex discrimination is prohibited by Title IX of the Education Amendments of 1972; discrimination on the basis of disability is prohibited by Section 504 of the Rehabilitation Act of 1973; and age discrimination is prohibited by the Age Discrimination Act of 1975. The Department of Justice also has delegated OCR responsibility for enforcing Title II of the Americans with Disabilities Act of 1990. (p. 1)

Today the Office of Special Education Programs (OSEP) administers the IDEA. The OSEP mission is as follows (OSEP, 2001):

OSEP is dedicated to improving results for infants, toddlers, children and youth with disabilities ages birth through 21 by providing leadership and financial support to assist states and local districts. OSEP administers the Individuals With Disabilities Education Act (IDEA). IDEA authorizes formula grants to states, and discretionary grants to institutions of higher education and other non-profit organizations to support research, demonstrations, technical assistance and dissemination, technology and personnel development and parent-training and information centers. These programs are intended to ensure that the rights of infants, toddlers, children, and youth with disabilities and their parents are protected. OSEP accomplishes this mission by

- Developing, communicating and disseminating Federal policy and information on early intervention and the education of infants, toddlers, children, and youth with disabilities;
- Administering formula grants and discretionary programs authorized by Congress;
- Fostering and supporting research and the development of knowledge and innovations to improve results for infants, toddlers, children, and youth with disabilities;
• Promoting and supporting the training of educational, related services, and leadership personnel, and parents and volunteers;

• Evaluating, monitoring, and reporting on the implementation of federal policy and programs and the effectiveness of early intervention and educational efforts for infants, toddlers, children, and youth with disabilities; and,

• Coordinating with other federal agencies, state agencies, and the private sector including parent and professional organizations, private schools, and organizations of persons with disabilities for the review of policy, program planning, and implementation issues. (p. 1)

In 1979, under the Department of Health, Education and Welfare, the first annual report *Progress Toward a Free Appropriate Public Education: A Report to Congress on the Implementation of Public Law 94-142* was submitted. The following year, the report was published by the newly established Department of Education. According to data from the National Health Interview Survey, annual health of the nation’s civilian, non-institutionalized population is assessed through in-person, computer-assisted interviews. An adult member of the household is asked questions about him or herself as well as about other household members, including children. Steady growth in special education and related services has been provided to children with disabilities since the original passage of Education for All Handicapped Children Act in 1975 (OSEP, 2000a, p. v). "The year 2000, marks the 25th anniversary of the passage of P.L. 94-142, the Education for All Handicapped Children Act of 1975" (p. v). The number of students ages 6 through 21 served under Part B of the Individuals with Disabilities Education Act (IDEA) reached 5,541,166 in 1998-99, a 2.7 percent increase over the previous year as shown in
Table 1. In the past decade, the number of students served grew 30.3 percent, from 4,253,018 in 1989-90 to 5,541,166 (OSEP, 2000b, p. 19).

Table 1
Number of Students Ages 6 Through 21 Served Under IDEA\textsuperscript{a} in the 1989-90 and 1998-99 School Years

| Specific Learning Disabilities | 2,062,076 | 2,817,148 | 36.6% |
| Speech and Language Impairments | 974,256 | 1,074,548 | 10.3 |
| Mental Retardation | 563,902 | 611,076 | 8.4 |
| Emotional Disturbance | 381,639 | 463,262 | 21.4 |
| Multiple Disabilities | 87,957 | 107,763 | 22.5 |
| Hearing Impairments | 57,906 | 70,883 | 22.4 |
| Orthopedic Impairments | 48,050 | 69,495 | 44.6 |
| Other Health Impairments | 52,733 | 220,831 | 318.7 |
| Visual Impairments | 22,866 | 26,132 | 14.3 |
| Autism | NA | 53,576 | b |
| Deaf-Blindness | 1,633 | 1,609 | -1.5 |
| Traumatic Brain Injury | NA | 12,933 | |
| Developmental Delay | NA | 11,910 | c |
| All Disabilities | 4,253,018 | 5,541,166 | 30.3 |


\textsuperscript{a} Data from 1989-90 through 1993-94 include children with disabilities served under Chapter 1 of ESEA (SOP). Beginning in 1994-95, all services to students with disabilities were provided under IDEA only.

\textsuperscript{b} Autism and traumatic brain injury were first required to be reported in 1992-93.

\textsuperscript{c} Developmental delay was first reported in 1997-98.

The percentage of students (ages 6-21) served under IDEA is presented by the disability category in Table 2. Learning disabilities were the most prevalent disability. The IDEA regulations define this category as comprising children with "a disorder in one
or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia” (34 CFR §300.7(c)(10)(i)” (cited in OSEP, 2000b, p. 21).

Table 2

<table>
<thead>
<tr>
<th>Disability Category</th>
<th>1989-90</th>
<th>1998-99</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Learning Disabilities</td>
<td>48.5%</td>
<td>50.8%</td>
</tr>
<tr>
<td>Speech and Language Impairments</td>
<td>22.9</td>
<td>19.4</td>
</tr>
<tr>
<td>Mental Retardation</td>
<td>13.3</td>
<td>11.0</td>
</tr>
<tr>
<td>Emotional Disturbance</td>
<td>9.0</td>
<td>8.4</td>
</tr>
<tr>
<td>Multiple Disabilities</td>
<td>2.1</td>
<td>1.9</td>
</tr>
<tr>
<td>Hearing Impairments</td>
<td>1.4</td>
<td>1.3</td>
</tr>
<tr>
<td>Orthopedic Impairments</td>
<td>1.1</td>
<td>1.3</td>
</tr>
<tr>
<td>Other Health Impairments</td>
<td>1.2</td>
<td>4.0</td>
</tr>
<tr>
<td>Visual Impairments</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Autism</td>
<td>NA</td>
<td>1.0</td>
</tr>
<tr>
<td>Deaf-Blindness</td>
<td>&gt;0.1</td>
<td>&gt;0.1</td>
</tr>
<tr>
<td>Traumatic Brain Injury</td>
<td>NA</td>
<td>0.2</td>
</tr>
<tr>
<td>Developmental Delay</td>
<td>NA</td>
<td>0.2</td>
</tr>
</tbody>
</table>


Prevalence rates in various disability categories have been consistent since 1989-90, with the exception of the increase in health impairments category. This was largely due to "increased identification and service provision to children with attention deficit disorder. Autism and traumatic brain injury were optional reporting categories in the
1991-92 school year and were required categories beginning in 1992-93" (p. 21). One-third of children had co-occurring disabilities. "The most common combinations of disabilities were learning disabilities with speech/language impairments and learning disabilities with emotional disturbance" (p. 44).

Educational services received in regular classes, resource rooms, or separate classes in regular schools were the most frequent location reported. "Children with two or more co-occurring disabilities received more special education and related services in separate classes, compared with children with one disability (28 percent vs. 21 percent). Overall, the percentage of children receiving services at a special day or residential school, at home, in a hospital or institution, or at a provider's office was small" (p. 42).

Data in Table 3 present the number and percentage of students receiving selected special education services according to whether they had one disability or two or more disabilities. Speech/Language Therapy was the most frequent service received, followed by developmental testing. In all categories of services, those with two or more disabilities received more than twice the number of services. The importance of accounting for comorbidity (co-occurring disabilities) may confound results in studies (OSEP, 2000b).
Table 3

Number and Percentage of Students Receiving Selected Special Education and Related Services, by Type of Services Received and Number of Disabilities

<table>
<thead>
<tr>
<th>Number of Disabilities</th>
<th>Transportation</th>
<th>Speech/ Language Therapy</th>
<th>Audiology</th>
<th>Mental Health or Counseling</th>
<th>Developmental Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>81,215</td>
<td>496,301</td>
<td>79,145</td>
<td>175,083</td>
<td>292,607</td>
</tr>
<tr>
<td>Percent</td>
<td>5.3</td>
<td>32.6</td>
<td>5.2</td>
<td>11.5</td>
<td>19.2</td>
</tr>
<tr>
<td>Two or More</td>
<td>138,437</td>
<td>414,615</td>
<td>99,482</td>
<td>171,336</td>
<td>245,243</td>
</tr>
<tr>
<td>Percent</td>
<td>19.3</td>
<td>57.8</td>
<td>13.9</td>
<td>23.9</td>
<td>34.2</td>
</tr>
<tr>
<td>Total</td>
<td>219,652</td>
<td>910,916</td>
<td>178,627</td>
<td>346,419</td>
<td>537,850</td>
</tr>
</tbody>
</table>


*Respondents could indicate more than one type of service received. Percentages are based on total number of respondents by type of service received and number of disabilities.

The caregivers of children with co-occurring disabilities requested more services than those caregivers with children that had one-disability. Furthermore, caregivers with children that had co-occurring disabilities were less satisfied with the services provided for their children compared with caregivers that had children with one disability (OSEP, 2000b, p. 166).

In summary, the historical development of U.S. governmental involvement in the special needs of the disabled evolved through a series of legislative efforts that aim to protect the rights of all minority groups (Civil Rights Act) and provide equal protection through the 14th amendment (Brown versus the Board of Education). The Rehabilitation Act of 1973 addressed protection against discrimination solely due to disabilities. The Americans with Disabilities Act (ADA) passed in 1990, extended civil rights similar to
those of the Civil Rights Act of 1964 to people with disabilities. It is extremely significant in legislative history as "it opens the world to participation by persons with disabilities" (Kauppi, 2002, p. 7). The most significant educational legislation is the Individual's with Disabilities Education Act (IDEA), passed originally in 1975 as PL 94-142 (EAHCA), requiring an IEP, reauthorized in 1991 as IDEA, and amended in 1997 to emphasize the importance of free appropriate public education (FAPE) to students with disabilities.

**Multiple Typologies of Functioning and Disability**

Disability is not only a U.S. concern, but also it is a global concern. The literature review presented thus far shows there are varying ways to classify or categorize types of disabilities. The importance of developing classification systems that are common to all disciplines throughout the world cannot be over-emphasized. Not only might comparisons of data assist in policy development and financial allocations, but also professionals that deliver services and perform research are better able to select appropriate interventions, as well as to better generalize research results. The following review serves to describe global initiatives in developing classification systems, as well as to show the varying systems that are presently used to categorize disabilities.

**Global Perspectives: Functioning and Disability**

Internationally, there are two related classifications of diseases and a third is the classification on functioning and disability. *The International Classification of Diseases* (ICD) is used to code mortality data (diseases, disorders or other health conditions), with the latest version the ICD-10, developed in 1992. *The International Classification of Diseases, Clinical Modification* (ICD-CM) is used to code morbidity data, with the latest
version ICD-10-CM due out shortly. The newly designed *International Classification of Functioning & Disability and Health* (ICF) codes functioning and disability (CDC, 2001).

A worldwide effort to develop a classification system of disabilities and impairments is an international priority and remarkable steps have been taken recently. For the past several years, the World Health Organization has taken the leadership role to address this issue. The first system developed in 1980 was the *International Classification of Impairments, Disabilities, and Handicaps*, or ICIDH by WHO to provide a unifying framework for classifying the consequences of disease (CDC, 2001). "The U.S. CDC reports that "after nine years of international revision efforts coordinated by the World Health Organization (WHO), the World Health Assembly on May 22, 2001, approved the *International Classification of Functioning, Disability and Health* and its abbreviation of ICF" (p. 1).

A press release by WHO (2001b) on November 15, 2001, states: "A new World Health Organization (WHO) publication to classify the functioning, health and disability of people across the world challenges mainstream ideas on how we understand health and disability" (p.1). The ICF (*International Classification of Functioning, Disability and Health*), is the work of 65 countries, and is accepted by 191 countries as the international standard to describe and measure health and disability. It is available in six languages: English, French, Spanish, Arabic, Chinese and Russian (WHO, 2001b, p. 1).
International Classification of Functioning, Disability and Health (ICF): An Integrated Biopsychosocial and Contextual Model of Disability and Functioning

The U.S. Department of Health and Human Services (CDC, 2001) presents the WHO description of the ICF:

Functioning and disability are viewed as a complex interaction between the health condition of the individual and the contextual factors of the environment as well as personal factors. The picture produced by this combination of factors and dimensions is of 'the person in his or her world.' The classification treats these dimensions as interactive and dynamic rather than linear or static. It allows for an assessment of the degree of disability, although it is not a measurement instrument. It is applicable to all people, whatever their health condition. (p. 1)

The language of the ICF is neutral as to etiology, placing the emphasis on function rather than condition or disease. It also is carefully designed to be relevant across cultures as well as age groups and genders, making it highly appropriate for heterogeneous populations. (p. 1)

The future implication of ICF for establishing an international standard, measuring outcomes, usefulness in assessment and planning and potential use in policy making is formidable. ICF provides opportunities for persons with disabilities. "ICF provides an appropriate instrument for the implementation of stated international human rights mandates as well as national legislation" (WHO, 2001a, p. 6).

The ICF is based on an integrated biopsychosocial conceptual model to approach disability and functioning that integrates two opposing models, the medical and social models. In explaining disability and functioning, typically the medical or social models prevail. "The medical model views disability as a problem of the person, directly caused by disease, trauma or other health condition, which requires medical care..."
provided in the form of individual treatment by professionals. Management of the
disability is aimed at cure or the individual's adjustment and behavior change. Medical
care is viewed as the main issue, and at the political level the principal response is that of
modifying or reforming health care policy" (WHO, 2001a, p. 20).

Those that advocate the social model of disability view "the issue mainly as a
socially created problem, and basically as a matter of the full integration of individuals
into society. Disability is not an attribute of an individual, but rather a complex
collection of conditions, many of which are created by the social environment. Hence the
management of the problem requires social action, and it is the collective responsibility
of society at large to make the environmental modifications necessary for the full
participation of people with disabilities in all areas of social life. The issue is therefore
an attitudinal or ideological one requiring social change, which at the political level
becomes a question of human rights. For this model disability is a political issue" (WHO,
2001a, p. 20).

The ICF model integrates the various perspectives of functioning through the
"biopsychosocial" approach to "provide a coherent view of different perspectives of
health from a biological, individual and social perspective (WHO, 2001a, p. 20). This
multi-perspective approach to the classification of functioning and disability is an
interactive and evolutionary process. A person's functioning and disability is conceived
as a dynamic interaction between health conditions (diseases, disorders, injuries, traumas,
etc.) and contextual factors (environmental and personal factors). "Functioning is an
umbrella term encompassing all body functions, activities and participation; similarly,
disability serves as an umbrella term for impairments, activity limitations or participation
restrictions. ICF lists environmental factors that interact with all these constructs (p.3). The ICF includes both strengths and deficits of a person.

With ICF, all types of diseases and conditions are placed on an equal bases whether a cold, angina or depression. "This neutral approach puts mental disorders on a par with physical illness and has contributed to the recognition and documentation of the world-wide burden of depressive disorders, which is currently the leading cause, world-wide, of life years lost due to disability (WHO, 2001b, p. 1). Although the ICF is a new classification system, "using the ICF framework, WHO estimates that as much as 500 million healthy life years are lost each year due to disability associated with health conditions. This is more than half the years that are lost annually due to premature death (WHO, 2001b, p. 1). The ICF does offer one solution to organizing the various categories of disability. Various disciplines can be served, cross-country data comparisons can be made, a common language can be employed, and service providers, policy-makers and researchers can strengthen the validity of their decisions.

Classifications of Disabilities and Special Education

The categories of classifications or categories of disabilities is complex and varies widely in the literature. Durkin (2001) provides one of the most recent international reports of categories of childhood disabilities in a paper presented at the United Nations, International Seminar on the Measurement of Disability, June 2001. A 10-Question screening tool of disabilities for 22,000 children, 2-9 years old, living in Bangladesh, Jamaica and Pakistan, constitutes the sample. "These surveys have generated estimates of prevalence that range from 10 to 44 per 1000 children for severe disabilities and up to 20% for mild disabilities" (p. 6). The screening tool is consistent with ICF and
recommendations for future refinement are to include behavioral questions. Disabilities are organized according to the following category areas:

1. Cognitive and Other Disability
2. Cognitive Only (not accompanied by other disability)
3. Motor
4. Seizure
5. Vision
6. Hearing

Table 1, shown previously, identifies thirteen disability categories reported by the U.S. and outlying areas in the Twenty Second Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act. Developmental delay applied only to children ages 3 through 5 before the IDEA Amendments of 1997 were implemented. "The use of the developmental delay category is at the discretion of the State and local education agencies" (OSEP, 2000b, p. 19):

The National Center on Birth Defects and Developmental Disabilities (CDC, n.d., National Center) lists eight categories of disabilities on its website:

1. Developmental Disabilities
2. ADHD
3. Autism
4. Cerebral Palsy
5. Early Childhood Development
6. Hearing Impairment
7. Mental Retardation
8. Vision Impairment

Nationally, Umansky and Hooper (1998) report that the majority of research studies of early intervention focus on two categories of disability. These are the special
education needs population with developmental deficits "as a result of environmental factors and those who are disabled as a result of biological factors" (p. 9). Umansky and Hooper (1998) presented various categories used in special education to characterize disabilities which implement IDEA:

1. Mental Retardation (Intellectual Disability)
2. Hearing Impairments
3. Speech or Language Disorders
4. Visual impairments
5. Serious Emotional Disturbance (caused by environmental, neurological or chemical factors)
6. Orthopedic Impairments
7. Other Health Impairments: (limited strength, vitality or alertness as a results of a chronic or acute health problem related to a heart condition, tuberculosis, rheumatic fever, nephritis, asthma, sickle cell anemia, hemophilia, epilepsy, lead poisoning, leukemia, diabetes, or other conditions that adversely affect a child's educational performance (p. 23).
8. Autism (a developmental disability)
9. Traumatic Brain Injury

Umansky and Hooper (1998) further indicate that specific learning disabilities, multiple disabilities, autism and developmental disabilities are also defined in IDEA. This brings the total to 13, and is the same as used by the U. S Department of Education, OSEP in their annual reports on the implementation of IDEA.

The Diagnostic and Statistical Manual (DSM) of the American Psychological Association, now in its fourth revision (DSM-IV), provides a very detailed categorical structure to organize problem behaviors. Numbers code the various diseases and illnesses. Efforts are to comply with international categories established by the World
Health Organization (American Psychological Association, 1994). Within the category of Disorders Usually First Diagnosed in Infancy, Childhood, or Adolescence are the following:

1. Mental Retardation
2. Learning Disorders
3. Motor Skills Disorder
4. Communication Disorders
5. Pervasive Developmental Disorders (including autism)
6. Attention-Deficit and Disruptive Behavior Disorders (including Attention-Deficit/Hyperactivity Conduct, Oppositional Defiant and Disruptive Behaviors)
7. Feeding and Eating Disorders of Infancy or Childhood
8. Tic Disorders
9. Elimination Disorders
10. Other

In contrast to the categorical approach, Umanski and Hooper (1998) report special education use of the dimensional approach. This approach developed by Achenbach, Edelbrock, and Howell, uses "empirically derived dimensions to classify behaviors and emotional problems of childhood" (p. 293). In the prior versions of the Child Behavior Checklist, dimensions included internalizing and externalizing behaviors. Achenbach and Rescorla (2001) describe the latest version of the Child Behavior Checklists (pre-school and aged 6-18), which have been expanded to include DSM classifications. This empirically based system assesses competencies, adaptive functioning and problems.

Umanski and Hooper (1998) organized a discussion of children with special needs into the following categories:

1. Cognitive Differences
2. Sensory Impairments (visual, hearing)
3. Emotional Disorders (personality, conduct, immaturity and delinquency)
4. Physical Impairments
5. Attention Deficits (ADD and ADHD), neurological-based problems

A search of the world wide web reveals similar categorizations of disabilities. The Canadian Health Network (1999) characterizes disabilities as:

1. Physical (affecting the body)
2. Psychiatric (affecting the mind)
3. Sensory (affecting seeing or hearing)

In the State of New York "developmental disability means a disability of a person which: is attributable to mental retardation, cerebral palsy, epilepsy, neurological impairment, or autism" (Amaral, 2002, p. 1). The University of Minnesota (2001) reports disability categories of:

1. Deaf and Hard of Hearing
2. Vision Impairments
3. Mobility Disabilities
4. Psychiatric Disabilities
5. Learning Disabilities
6. Attention Deficit Disorder
7. Systemic Disabilities (affecting one or more of the body's systems)
8. Brain Injuries

Florida Statutes, Title 44 Civil Rights, Chapter 760, Civil Rights Act (n.d.) provides the definition of handicap as: "(a) A person has a physical or mental impairment which substantially limits one or more major life activities, or he has a record of having, or is regarded as having, such physical or mental impairment; or (b) A person has a developmental disability as defined in s. 393.063" (p. 12). Florida Statutes, Title 29
Public Health, Chapter 393 Developmental Disabilities, Section 063 (n.d.) states "Developmental disability" means a disorder or syndrome that is attributable to retardation, cerebral palsy, autism, spina bifida, or Prader-Willi syndrome and that constitutes a substantial handicap that can reasonably be expected to continue indefinitely" (p. 2). This section also defines retardation, severe self-injurious behavior and a developmental delay in cognition, language, or physical development. Thus the categories of disabilities would be:

1. Physical Impairment Limiting a Major Life Activity
2. Mental Impairment Limiting a Major Life Activity
3. Developmental Disability:
   - Retardation, cerebral palsy, autism, spina bifida, or Prader-Willi syndrome or
   - Delay in developmental delay in cognition, language, or physical development

Comorbidity (co-occurring disabilities) needs to be considered in empirical studies. Estimates of comorbidity reports are as high as 22.5% in the Annual Report by OSEP (2000b). "Estimates vary from study to study, in part because of differences in the populations covered and definitions of disability used. Some researchers estimate that 19 percent of special education students have co-occurring disabilities; others report figures as high as 48 percent" (Hogan, Msall, Rogers, & Avery, 1997; Wagner et al., 1991, as cited in OSEP, 2000b, p. 33). Light and DeFries (1995) indicate that a study of children with one disability may confound study findings when results may be due to a second disability such as attention deficit disorder, which is ignored.

While variations in defining and measuring disability and functioning are apparent, there are common agreements as well as new initiatives at the international level to find a consistent method to define and measure disability and functioning. The
ultimate goals are to (1) identify those with disabilities and their special needs through proper assessment; (2) discover and implement effective interventions; and (3) create an environment that maximizes capabilities, strengths and competencies of those with disabilities; promote effective adaptive functioning and minimizing problems that affect adjustment; and promote a quality of life.

*Coping and Adaptation to Disability and Applications in Special Education*

Several models and theories are developed to address adaptation and adjustment. The stress-coping-growth model developed by Lazarus and Folkman (1984) is one of the most frequently used models, with much research in the areas of stress-coping-growth of adults. The model is a predominant and prevailing influence on research and theory development with children because of the significant role that appraisal of life events and coping strategies used as children play later on in adult life. "A key contribution is the recognition that the coping responses we choose (both as children and as adults) may be more influenced by our appraisals of the threat and the resources available to us than they do with an "objective" reality" (Thompson, 1996, p. 1).

Facklam (2002) and Miller (1992, 1999) describe the importance of effective coping strategies in promoting successful adaptation for a person with chronic illness or a disability. Facklam (2002) summarized the literature and presented three classic types of coping: behavioral, affective and cognitive. Behavioral coping is action and problem-oriented, which results in the person confronting or avoiding a situation. Affective coping is an emotion-focused, self-regulatory attempt to manage emotional reactions such as depression or anger by ventilating, blaming self or others, accepting, or resigning.
oneself to the situation. Cognitive coping is examining the situation and either minimizing, ignoring or addressing it. Coping strategies play a significant role in adaptation for a person with illness or disability. In particular, for those with physically disabling conditions, positive adaptive coping strategies that promote better psychosocial adaptation are problem-focused, information gathering, and support-seeking. Ineffective coping strategies are passive, emotion-focused, self-blame techniques.

Although not usually discussed in the literature as a coping mode, in 1974, Adams and Lindeman identified movement as a principle mechanism in biologic coping stating "Virtually all response to environmental challenge involves purposeful movement, either of the total organism or its appropriate parts" (cited in Miller, 1992, p. 86). Mobility plays a significant role in a child's life: purposeful movement, self-preservation, physiologic and emotional strivings, exploring the environment and expression of tension and anxiety through motor-expressive discharge. It is connected with all our life processes (Miller, 1992).

Individuals confronted by a disabling condition go through a complex adaptive process that is influenced by both internal and external factors. Adapting to and living with disabilities is difficult. The adjustment process can be long and confounded by the internal and external factors that span biological, psychological, interpersonal, and sociocultural aspects of life (Miller, 1999). In 1983, LaRocca, Kalb, and Kaplan described four stages in the adjustment process for people with multiple sclerosis: uncertainty, acceptance, adaptation and emergence which is making the necessary social, physical, emotional and social changes in one's lifestyle. The process of adaptation is ongoing throughout the life span (as cited in Miller, 1992).
In conceptualizing a person's acceptance of disability, Livneh and Antonak (1990 and 1997) described two different but related terms, "psychosocial adaptation" and "adjustment" to disability. The process by which a person develops an optimal person-environmental relationship is termed psychosocial adaptation. Whereas "adjustment" to disability is seen as phases in the adaptation process where the person experiences different patterns in response to the disability. There are eight patterns that may be experienced during the adaptation process: shock, anxiety, denial, depression, internalized anger, externalized hostility, acknowledgment and adjustment (Horowitz, 1985, 1986; Livneh & Antonak, 1997). The adapted reactions identified in empirical studies are acknowledgement, which is intellectual acceptance, and adjustment, which is affective acceptance of disability (Livneh & Antonak, 1997).

In describing adjustment models, many authors cite the 1978 book, *Psychosocial Adjustment to Disability* by Roessler and Bolton as a classic (Felton & Revenson, 1984; Fiore, Coppel, Becker & Cox, 1986; Siebens, 1990; Goldberg, 1992, Thompson, 1996, and Facklam, 2002). Among adjustment models described is the survival model which includes adjustive behaviors based on a desire to live and reproduce which may not always be value-based behaviors that are acceptable to society. In the engineering model, adjusted relates to whether the person is performing optimally and efficiently based on capabilities and situational demands. The positive striving model closely follows a self-actualizing model resulting in varying degrees of adjustment, including a positive self-concept, integrated personality, independent behaviors and environmental mastery with relationships, work and activities, in a variety of situational contexts. The
**medical model** suggests the causal problem of a disease or trauma results in observable behavioral symptoms.

Rossler and Bolton integrated these models in a **behavioral coping model** which "includes survival ability, potential assets, person-environment congruence, and positive striving" (Facklam, 2002, p. 1). The concept of adjustment in this model is the way an individual is adapting, in this case adaptation to disability (Facklam, 2002). "Inability to adjust to disability in this model is seen as a failure to resolve problems in living: Active participation in social, vocational, and avocational pursuits; successful negotiation of the physical environment; awareness of remaining strengths and assets as well as existing functional limitations" (Facklam, 2002, p. 1).

Thompson (1996) reports that while most of these models have been used, universal agreement of a specific model for the disabled and vocational development has not been accomplished. Research primarily focused on well-known vocational development theories (psychodynamic and longitudinal) that have been tested in research for non-disabled people, and then generalized to the disabled models (Goldberg, 1992).

The dominant model in special education has long been the behavioral model, which emphasizes that environmental or external factors are the cause of school behavior disorders. The model is particularly useful with children that have emotional or behavioral disorders (Kauffman, 2001). The medical model, and its emphasis on within-child or internal factors as the causes of school behavior disorders competed with the behavioral model in special education for many years (Kauffman, 2001).

Siebens (1990) criticized the medical model for its inappropriateness with the disabled. Specifically, treatment of acute illness and injury are different than managing
long-term conditions and disabilities. The major criticism is the medical profession controlling the care and the freedom of choice that the individual loses. Siebens believes that the disabled person is not medically ill. Kauffman (2001) indicated that use of the medical model in modern-era special education in the second half of the Twentieth Century was appropriately vilified. Disordered school behavior or learning problems were seen to be caused by psychodynamic conflicts or subsequently minimal brain dysfunction, with little emphasis on situational constraints and the environment. Medical diagnosis and treatment had to be implemented prior to introduction of school interventions. Kauffman (2001) suggests that because the medical model has been held in disregard so long, only a few active special educators may even recall its ever having been acceptable in education. However, changing perspectives in use of the medical model in special education are evolving.

As noted in this literature review, the ICF developed by the World Health Organization is based on an integration of two opposing models, the medical and social models. The ICF promotes use of an integrated biopsychosocial conceptual model to approach disability and functioning that integrates medical (biological and psychological) and social models. This view is receiving more attention in special education as a result of new findings in treatments and well as recognition of the comorbidity (co-occurring) of disorders. For example, a child with a behavioral disorder could have a disorder that is treatable by psychopharmacology (Kavale 2001). Forness and Kavale (2001) emphasize the critical importance of integrating the medical and behavioral models particularly in special education decisions related to functional behavioral analyses and positive behavioral intervention. Integrating these models requires a carefully thought out
collaborative process for schools ultimately aimed toward enhancing school outcomes for children (Kollins et al., 2001).

The integrative models described by the ICF and proposed by Kavale (2001) and others (Kollins et al., 2001; Forness & Kavale, 2001) are similarly described by Farmer, Quinn, Hussey & Holahan (2001) in the holistic developmental model. "From a holistic developmental perspective, the individual functions as an integrated organism, and development arises from the dynamic interrelations among internal and external factors (e.g., behavioral, biophysical, cognitive, contextual, social interactional" (p. 1). "Such factors influence each other bi-directionally and form an interconnected system of correlated constraints" (p. 1). This leads to the authors' systems perspective of the development of disruptive behavioral disorders (Hussey & Holahan, 2001).

**Special Education**

The ideal situation of any person with special needs is to be surrounded by specialists in the field. The teacher's role in special education programs is to become the major communicator between parents and other staff involved. The teacher probably spends the most time with the child aside from the parents. The teacher is also the one who works more around this population than anyone else. Therefore, teachers become the resource for parents, colleagues, and other personnel involved (Umansky & Hooper, 1998).

In the mid seventies, when Special Education was just beginning to experience reforms, outside services were not considered particularly important. With PL 94-142 and its amendments, ancillary services came to play an important role in the education of a child. PL 94-457 extends the rights and privileges of children with special needs.
also requires that parents and teachers confer to design an appropriate program for the
disabled child. Other school staff members, such as counselors, social workers, and
therapists can communicate and guide parents on their child’s behalf. The importance of
a therapeutic relationship outside of the school setting is noted to be of critical value in
producing positive outcomes (Seligman, 2000). PL 99-457 places the ultimate
responsibility for planning, implementing and involving services of others to the teacher.
The intervention approach comes from a central theoretical scheme that is constantly
repeated in the literature that collaboration between school, community and public
recognition is necessary for optimal progress (Umansky & Hooper, 1999, p.12).

The teacher has a strong perception of each child's unique personalities and play a
critical role in identifying interventions that best influence development and learning.
Characteristics of effective teacher's of students with varying disabilities require certain
personal qualities to be able to handle the diversity. Flexibility, diplomacy, quick
wittedness to get over the panic periods, and most important is the ability to demonstrate
commitment for each individual student.

In a study conducted by Wittmer and Myrick, the most effective teachers have
softer personality traits such as compassion, humor, warmth and trust. Teachers
exhibiting hard or cold personality traits such as insensitive, authoritative, demanding and
disciplinarian have a poor effect with the students (as cited in Seligman, 2000). Working
with colleagues, other professionals, and children takes patience, flexibility and
alternative plans. Parents and the team tend to become close to each other, so it is
important to communicate on the same level. Parents and teachers have a special
regression.
The teacher must remain objective and always a pillar of support for the children and their families. Not only is it an extra burden placed on the role of a teacher to understand families of children with disabilities, but also understand that families may lack the knowledge and training necessary. It is a futile task. The amount of patience the parents must exhibit can exceed that of a parent involved with raising "normal" children. Patience must be abundant anytime children are involved just more so when disabilities are added to the scenario (Seligman, 2000).

Part of the dynamics of having special education programs work is to have an understanding with the parents and existing extended services. Normal parenting is difficult in and of itself, but when a child with a disability is a member of that family, family dynamics become more complex. Stress and transitions affect family functioning, structure and coping mechanisms on the parents and the siblings. The family lifestyle must make changes to operate as "normally" as possible (Seligman, 2000, p.62).

**Human-Animal Interaction**

Through this period of observation and discovery, many people have found numerous positive effects from animals (All, et al., 1999). Animal therapies can often succeed in reaching children when other people cannot (Kaufmann, 1997). Though many studies are anecdotal, people who have been involved in the process of using animals for therapy are clearly convinced that the human animal bond does exist and the interaction fosters benefits.

Theoretical and empirical literature suggests close supportive relationships are beneficial to those exposed to stressful circumstances. Studies of pets have revealed the
important contributions and effects animals can have on attitudes and growth and to children's lives and developmental attitudes.

Myers (1999) indicates that modern theories of development are marginal regarding human-animal interaction. "A similar bias is evident in research on the role of animals in fostering developmental goals such as empathy, social skills, cognition, and other concerns" (p. 7). The recent developments in animal-facilitated therapy give animals a new role in human development particularly in fostering empathy, social skills, and cognition. The role that animals play in child development is changing our view that "what makes us most human is what sets us apart and that the relevant environment of human beings is exclusively other humans" (Myers, 1999, p. 10). The responses that children give to animals, and "meanings they express by imitation or words demonstrate a fine sensitivity to the differences those animals present as interactants" (p. 10). The social abilities of children can adjust to varying characteristics of interactants, in this case, the animals. The essential variable of interest, the child-animal relationship, needs to be the object of understanding (p. 7).

History shows that animals play an important role in human lifestyles. The so-called human-animal bond (HAB) or relationship is important historically to the survival of the human race--especially in the past, but also in today's world. It is recorded that even in the 1860s, Florence Nightingale discovered that pets were excellent medication for persons who had long and chronic illnesses. As far back as 1792, it was discovered that psychiatric patients did not have to be given harsh drugs or bound in restraints if they could care for animals while in mental institutions (Kaufmann, 1997).
**Delta Society: Human-Animal Bond**

Today, the Delta Society is perhaps the most established U.S. non-profit organization on human-animal interactions, and it is the leading international resource for the human-animal bond. Through its commitment to research, the Delta Society is one of the leading forces in validating the role of animals for people's health and well-being. Research results are communicated to the media and health and human service organizations and professions (Delta Society, 2001c). Its mission is "improving human health through service and therapy animals" (Delta Society, 2001c, p. 1).

In 1977, the Delta Foundation under the leadership of Michael McCulloch, MD was established in Portland, Oregon. Delta's first president was Leo K. Bustad, DVM, PhD, a pioneer in human-animal bond theory and application, and Dean of a veterinary college. Early Delta members were primarily from the veterinary, human health professions and university faculty. In the early 1980s, the first national magazine on how animals enrich lives and the first guidelines for animals in nursing homes were published.

Between 1985 and 1992, Delta funded 20 studies on how animals affect health and well-being. Scientific information emerged about how animals impact people who are ill and disabled. In the late 1980s, educational materials were created for pet owners and the general public, which also broadened membership in Delta to these groups. In 1987, Delta sponsored development of the first hippotherapy curriculum in the United States (Delta Society, 2001c, 2001d). Hippo comes from Greek origin meaning horse and therapy is a treatment modality (Heine & Benjamin, 2000). The hippotherapy curriculum trains physical and occupational therapists to use the horse to treat people with movement disorders (Delta Society, 2000d). In that same year, the first scientific

Two major categories of animal interaction emerge as defined by the Delta Society's National Standards Committee in 1991: Animal Assisted Activities (AAA) and Animal Assisted Therapy (AAT). In 1992, the *Standards of Practice* in Animal-Assisted Activities and Animal-Assisted Therapy was published, now titled *Standards of Practice in Animal-Assisted Activities and Therapy* (Delta Society, 2001f). This led to further expansion of the scientific and education base, and provision of services at the local level. These services include providing the first comprehensive training in animal-assisted activities and therapy to volunteers and health care professionals. In 1992, Delta was selected as first headquarters of the International Association of Human-Animal Interaction Organizations, and became founding member (Delta Society, 2002d).

In the middle to late 1990s, books were published, conferences conducted, and cooperative efforts with the CDC were established. Public policy involvement expanded with work regarding service animal issues with the transportation industry, especially Amtrak, Greyhound, and Project ACTION. *Visiting Animal Programs For Hospitals* were introduced. Consultation with states included, Montana Medicaid to initiate first third-party reimbursement for service dogs, revision of state laws regarding service animals in Texas, Maryland, and Montana to comply with ADA and work with the Delaware Developmental Disabilities Council to develop third-party reimbursement for people with disabilities receiving state assistance, for service animal expenses (Delta Society, 2001d). Delta Society maintains an *Animal-Assisted Activities and Therapy*
Most recently, top Delta Task Force researchers in a Delta Task Force established the agenda for the next symposium on physiological and psychological effects of pets on people to be held February 12, 2002, in Las Vegas (Delta Society, 2002c). Perhaps the most significant advance of the Delta Society was the development of the *Standards of Practice in Animal-Assisted Activities and Animal-Assisted Therapy*, which provides guidance in the administrative structure of AAA/AAT programs, including animal selection, personnel training, treatment plan development, documentation and more. Use of the standards provides a sound base on which to build quality AAA/AAT programs (Delta Society, 2001f).

**Animal Assisted Activities (AAA) and Animal Assisted Therapy (AAT)**

Two major categories of animal interaction as defined by the Delta Society National Standards Committee in 1991 are AAA and AAT. AAA "provide opportunities for "motivational, educational and/or recreational benefits to enhance a persons quality of life. AAA are delivered in a variety of environments" (Kaufmann, 1997, p. 29). It is a professional, paraprofessional, or voluntary process where knowledge is applied about the animals and human population and how they react. "Together the AAA specialist and the animals (who must meet specific criteria regarding health, grooming, and behavior) deliver opportunities for animal-oriented interactions that can benefit people in schools, health care facilities, and other residential and treatment locations. Animal Assisted Therapy (AAT) is a goal directed intervention in which an animal is an integral part of the treatment process" (Kaufmann, 1997, p. 29).

AAT is designed to promote improvement in the physical, psychological and/or cognitive functioning. AAT is directed and delivered by an animal specialist. There is
also at least one human-service provider who within the scope of the profession includes animals as a treatment method. An AAT specialist demonstrates skill and expertise in human-animal interactions with clinical applications. AAT is a goal-oriented process over a period of time with set objectives. Recreational activities (AAA) are less structured, and may not necessarily have goals for each visit, or tracking of progress over time (Delta Society, 2001a). Although it is not as structured as AAT, it is believed that participants do benefit from AAA. The terms must not really be interchanged, because there is a difference (All, et al., 1999). Pets may provide "an external focus of attention" (Jennings, 1997, p. 358). AAA might serve as an intrinsic appeal to children. AAA can produce a calming effect on students that can help them focus on learning stimuli.

While it is important to identify the type of assistance a program is using (AAA or AAT), the key that makes both work is that it is outside of a clinical setting, and occurs in a natural environment. The animal is not a tool to be used educationally, but a partner to visit and have fun with, and learn to love. It is this development or the relationship between the child and animal that leads to the greatest benefits in this field of work (Delta Society, 2002b). The research conducted in the 1980s documents the fact that animals can improve sociability, bring animation to those who have been withdrawn, enhance morale, provide sensory stimulation, and reduce reliance on psychotropic medication (Arkow, 1984). The 1980s was the era of pet acceptance as an alternative medication for healing. Research documents that pets foster socialization, animate the withdrawn, enhance morale, and fulfill needs of nurturing. It also documents that animals help reduce reliance on psychotropic medications as well as provide significant forms of sensory stimulation. The child's attachment to an animal has been positively related to
the child's sense of self-esteem (Triebenbacher, 1998). Animals may successfully reach at-risk youth or children with emotional problems as well as children with mental and physical disabilities where humans cannot reach. Prisons have been using animal programs for successful rehabilitation. According to Edney (1995), it may be possible to decrease anti-social behavior and crime by careful introduction of animals to youths with problems. The animal-person interaction fosters the formation of bonds and learning about responsibility and love.

Nathanson and deFaria (1993) report that dolphins can be both a stimulus and a reinforcement for increasing attention as well as language skills among disabled children. Findings indicate that dolphins are two to ten times more effective than traditional reinforcements used in land-based classrooms.

Poleshuck (1997) provides a very good discussion of AAT where animals are used as a treatment modality with children and adolescents. AAT is defined in the context of occupational therapy. A listing of resources, pertinent organizations as well as an explanation as to how to create and implement an AAT program are included. One of the theories proposed is that children will not fully cooperate in therapeutic activities if they are not motivated. Meaningful activities, such as with animals, are helpful in establishing motivation. The benefits of AAT on the communicative, psychosocial, and academic functioning of children and adolescents with a variety of disabilities is discussed.

Poleshuck quotes the 1991 paper by Bowman and ten Bensel who contend that companion animals are a vital part of the healthy emotional development of children. The author also quotes the 1983 paper by Beiber who reported that animals could be
influential in encouraging children to speak or to improve their expressive skills, since communication is essential for psychosocial well-being and success in the world. Since expressing oneself is frequently difficult for children with developmental and emotional problems, animals can make the difference. As an occupational therapist, Poliekuck lists a number of health problems that can be improved with AAT, such as: range of motion, muscle strength, hand contractures, desensitization, fine motor skills, mobility, memory skills, attention skills, social skills, self-care skills, and self-esteem. One key conclusion states that since younger children do not usually understand the benefits of the hard work involved in therapy, they can be approached with the use of animals that will attract their attention and ease them into therapy. The animal environment transfers a clinical session into type of recreation.

Some benefits of behavioral models include the system of rewarding to reinforce good behaviors and taking away a reward to delete the bad behaviors. Intrinsic value is also a goal, since children who stay on task with AAA can better resist competing stimuli (Semrud-Cliikeman, Nielson, Sylvester, Parle, & Connor, 1999). The intervention of intrinsic appeal for a subject counters the disinterest that children may have in that subject. Such disinterest would inhibit learning.

Almost any type of animal can help children form strong emotional bonds. Professionals are beginning to realize this special ability or talent can be very be powerful in helping "at risk" children and children with special needs. Animals can help motivate, encourage learning cooperation and expression. Animals may become a stimulus for exercise, reduce anxiety and provide an external focus of attention. Animals are also a
source of comfort and may decrease loneliness and depression while promoting a more interesting environment (Keil, 1998).

Much of the literature is based on anecdotal evidence of how animal contact can be therapeutic, yet it is necessary to continue to clarify and measure this health producing relationship (Kaufmann, 1997). Research does lend credibility to the therapeutic use of animals in health care (Jorgenson, 1997). The synergistic phenomena between humans and animals should be given serious consideration. For years, history shows animals have played a significant role in the lifestyles of humans. The human-animal bond (HAB) (or relationships) has been historically important to human survival.

**Horseback Riding**

"When on a horse, your strengths are combined, and your weaknesses diminished."

A quote by Neil Cutler, a disabled rider, in Fischbach (1999), Strides: Therapeutic Riding

Animal therapy, particularly with horses can be documented as far back to the days of Florence Nightingale. England claims the first recorded use of animals for therapy in the late Eighteenth Century. Horseback riding became recommended for treatment of mental illnesses when attempting to decrease the use of drugs and restraints. The Army Air Corp in Pawling New York claims to be the frontrunner in the United States to aid patients by using animals in a therapeutic setting. Since then, there has been a wide use of animals in the healing process (Jorgenson, 1997).

Griffith (1992) chronicles the development of therapeutic horseback riding reporting a landmark event in the use of horses to help people with disabilities. In 1952,
Liz Hartel, from Copenhagen, was paralyzed with polio, but won a silver medal in riding at the Helsinki Olympic Games. In 1967 the first programs in the United States were the National Foundation for Happy Horsemanship for the Handicapped. The formation the North American Riding for the Handicapped Association, Inc. (NARHA) followed this.

Therapeutic Riding, also known, as Equine Assisted Therapy and Equine Facilitated Therapy, is practiced in some form in most countries in the world. Great Britain formed the Riding for the Disabled (RDA) program initially to promote competition and equine sports for the disabled. Germany and Switzerland have been in the forefront of developing and establishing Hippotherapy as a model. European countries have been utilizing horses in treatment programs for many years (All, et al., 1999).

Therapy Riding, Riding for the Disabled, and Developmental Riding is the use of a horse and equine-oriented activities to achieve a variety of therapeutic goals, including cognitive, physical, emotional, social, educational and behavioral goals. “Hippotherapy is a term that refers to the use of the movement of the horse as a tool by health professionals including Physical Therapists, Occupational Therapists, and Speech-Language Pathologists, to address impairments, functional limitations, and disabilities in patients with neuromusculoskeletal dysfunction. This tool is used as part of an integrated treatment program to achieve functional outcomes (NARHA, 2000e, p. H-2).

Psychomotricity, which aims to promote mind and body integration through movement, is a predominant concept found in the literature on therapeutic riding. The following literature on horseback riding is organized in four areas found to be
predominant terms used in the literature. These are NARHA, psychomotricity, therapeutic riding, and hippotherapy.

**The North American Riding for the Handicapped Association (NARHA)**

To promote and support therapeutic riding in the U.S. and Canada, NARHA was founded in 1969. Currently there are some 600 NARHA riding centers, serving more than 30,000 individuals with disabilities, for the purpose of establishing a sense of independence through horseback riding. These centers vary in size from small one-person programs, to very large operations with a variety of instructors and therapists. Other equine activities including driving, vaulting, trail riding, and competition or stable management at a center may be offered (NARHA, 2000a). “The goal is to graduate each rider to a higher level of independent riding” (DelGiudice & Berg, n.d. p.1).

The mission of NARHA is to foster "safe, professional, ethical and therapeutic equine activities through education, communication, standards and research for people with and without disabilities" (NARHA, 2000e, p. 1). NARHA assists riding centers in several ways for the benefit of individuals with disabilities. "NARHA provides program accreditation to ensure the highest safety standards at riding centers, instructor certification which brings knowledge of disabilities and that of horses together to best serve riders' needs, and low-cost liability insurance for NARHA riding centers" (NARHA, 2000a, p. 1).

NARHA maintains a web site of archived information about therapeutic riding (NARHA, 2000e). Topics include: hippotherapy, medication basics for mental health workers, therapeutic riding for clients with: visually impaired, ADD, autism, cerebral palsy, Down Syndrome, learning disabilities, mental health problems, mental retardation,
multiple sclerosis, spina bifida, and traumatic brain injuries. The web site also includes literature based on therapeutic riding perspectives from parent's, volunteers, and riders.

NARHA is a significant influence in producing educational resources including published standards that help in starting and maintaining therapeutic riding programs. NARHA conducts regional workshops and an annual conference and regional/state networks. "NARHA is the accrediting organization for Easter Seals' camps with equine activities. Other organizations participating in NARHA riding programs include the Muscular Dystrophy Association, Multiple Sclerosis Society, Special Olympics, Spina Bifida Association and United Cerebral Palsy" (NARHA, 2000a, p. 1).

Psychomotricity

"Psychomotricity concerns the progressive development of both the mind and body and their interaction under the influence of organic maturation and social stimuli" (Spink, 1993, p. 9). What this means is that the mind and body integration and movement experience and education can be applied to the field of therapeutic riding. It is the mind-body relationship between movement and its effects (Spink, 1993).

Barwick (1986) a French therapist claims psychomotricity reunites a person with self, promotes self-awareness and coexistence with one's environment. It aims at building an individual who becomes able to reflect mental and physical ease and harmony. One of the paramount achievements with horseback riding, which is more than challenging, is to become one with the horse. A therapeutic relationship is necessary in any therapy. In this case, the horse is the one that the student needs to have an effective relationship. Horses offer passive therapy at a minimum just by clients sitting on their back. The bonding, the caring, the effort alone helps this synergy to come together.
Through psychomotricity, energy runs through the body and shifts into positive channels. It is almost as if the feelings and actions of the introverted are expressed and unacceptable extroverted activities are calmed down (Barwick, 1986).

Developmental riding is another term used in therapeutic riding. This is an expressive therapy that targets the expertise of a combination of health or educational professions: physical therapy, occupational therapy, rehabilitation, speech therapy, and special education. Developmental riding therapy incorporates aspects of psychomotricity and movement psychology. Spink (1993) who is a pioneer in the field coined her term, “DRT” Developmental Riding Therapy. Spink describes the need to build knowledge based on desirable contributions that could be made from individual professions as well as to identify the optimal mix of these professions to ensure quality programming.

**Therapeutic Riding**

Horseback riding produces physical, psychological, social, and educational benefits as a result of the relationship developed between a rider and the horse being ridden, such as through psychomotricity and developing the human-animal bond. Horseback riding as therapy provides an experience that contributes to development, rehabilitation, and enhancement of physical skills (All, et al., 1999). Maneuvering and control of a one and a half ton large animal can be extremely satisfying and can bring about favorable health and psychosocial outcomes. Jorgenson (1997) believes that riding encourages risk taking, development of patience, emotional control, and self-discipline. He also says that horseback riding allows subjects to socialize with others.

DelGiudice and Berg (n.d.) report that some NARHA centers place the emphasis on learning riding skills and using these skills for **recreational** or **sport** purposes. These
would include trail riding, driving, vaulting and competition. An emphasis on education and/or psycho/social development usually includes educational, behavioral, social, and emotional growth goals that are incorporated in the standard riding lesson.

The therapeutic/medical model integrates principles of medical and/or psychological development into various uses of the horse. In this case, the use of health professionals such as physical therapists, occupational therapists, psychologists, speech therapists and others become an important part of the program. Hippotherapy, a specialized form of riding therapy is best accomplished by a team approach of physical, occupational and speech therapists who are trained in this area. (Jorgenson, 1997).

Many centers use an integrated approach, involving all three of the above approaches. Most centers, as well, use a team approach to therapeutic riding. The team consists of some or all of the following: riding instructors, volunteers, educational specialists, behavioral specialists, and medical professionals (DelGiudice & Berg, n.d.).

Ideally the best therapeutic riding program team would include an: occupational therapist, NARHA certified instructor (physical therapist), special education teacher, parents and perhaps a speech or hearing specialist, and neurologist. The team depends on the type of disability, but ideally should consist of a team of 4 or 5 people to make it a well-rounded and successful program. In most cases in this country, the programs rely heavily on volunteers. Some parents participate as volunteers, but not with their own child. Horses must be properly selected, however the reality is that most are usually donated to the program. It is important for horses to be healthy to avoid veterinarian expenses. To successfully accommodate riders with varying disabilities, horses should have patient personalities, be well tempered, and not be biters, kickers or too high-
spirited. A physician may refer the children, but the family, teacher or therapist can make the initial referral based on the presence of disabilities (NARHA, 2000c; All et al., 1999). If the child's IEP calls for an extra specialist or program through assessment testing, then they are written into the program also. While many of these programs rely on volunteers, it would be better if the programs were able to provide more salaried academically prepared professionals that apply their body of knowledge in practice. Funding is an important aspect of this type of rehabilitation, and if it is recognized as being a significant therapy, then there is better chance of more funding and involvement of academically prepared professionals (All, et al., 1999).

A review of the literature shows several areas of agreement as to the therapeutic effects of horseback riding among most practitioners including occupational, physical therapists and medical professionals. These groups believe therapeutic riding is a unique form of recreation in which the rider and the horse can physically, mentally, and emotionally interact and compliment each other. Murray-Slutsky's (n.d.) provides a summary of research and one example of a case study is presented here.

Murray-Slutsky's article about therapeutic riding was featured on the South Enterprises Web site and retrieved September 10, 2001. Murray-Slutsky is an occupational therapist, who acknowledges that horseback riding is one of the world's oldest and most popular leisure activities both for people with and without disabilities. She notes that therapeutic riding began in Europe in 1970. She reports that according to the National Association for Therapeutic Horseback Riding (NARHA), children show improvement in self-esteem, attention, concentration, levels of alertness, speech, balance,
postural control, coordination, motivation, and pure satisfaction. Murray-Slutsky notes that for children with autism, riding can provide a pleasurable and therapeutic experience.

The child learns to communicate with the horse. Sounds such as "clicking" make the horse walk, "clicking" with a tap of the heel makes a horse trot, and "whoa" stops the horse. This gives children a unique, powerful experience. Murray-Slutsky contends that the horse provides a complex multi-sensory experience. The child gets input into: (1) the vestibular system through the movement of the horse, (2) the tactile system (sense of touch) through the feel of the horse/warmth of body, and (3) the proprioceptive system (sense of movement within its own tissues) through the input received through muscles, bones, and joints as the child moves on and adjusts to the movements of the horse. The child feels these three-dimensional rhythmic movements of the horse. The horse combines a forward and backward motion with a rotary movement that provides a constant stimulation to the vestibular system. This input can be intensified or decreased at the child's command (trotting or stopping the horse). The child must constantly be adjusting posture as the horse moves. Vestibular input when applied therapeutically with adaptive responses of the child is known to improve muscle tone and control, postural stability, auditory processing of instructions, attention and arousal level. Thus, the movement of the horse has a very calming and organizing effect on the nervous system.

Murray-Slutsky concludes by saying that a child may have decreased sensory awareness. They may be disorganized, not able to process requests from others, unable to tell if they are holding the reins or having difficulty maintaining their balance as the horse moves. For this child, exercising while on the horse can be hard work. The rider may complete upper extremity weight-bearing exercises, ride the horse backwards,
perform standing exercises in the stirrups, or many other exercises to help the child learn how to move and control themselves and the human body.

In a pilot case study, DelGiudice and Berg (n.d.) who work in a Minnesota school district, examine the potential of therapeutic horseback ringing effects to improve postural stability in subjects with cerebral palsy. The movements of the horse's gait are transmitted to the human trunk and pelvis. These closely resemble the motions produced by the human gait. These movements constantly challenge the rider's postural system to adapt to the gait as though it was his/her own. Developing the postural system can have a carryover effect and improve functional skills such as sitting, standing, and walking. Eight subjects were videotaped during an eight-week program resulting in a variety of subject responses. The authors conclude that motivation could have a direct effect on performance. Age also plays a major role in maturation and psychological development. Horseback riding as therapeutic intervention is highly worthwhile. The preliminary evidence shows that therapeutic riding can positively influence postural stability of subjects with cerebral palsy, and the level of success may depend upon age, maturation, motivation, and active participation.

Bream and Spangler (2001) summarize three major areas of benefit for those with disabilities that participate in therapeutic horseback riding: physical, psychological and social. For physical benefits, those with disabilities in the ability to perform basic life functions such as "balance, proprioception, ambulation, posture, and manual dexterity" (p. 1) can benefit from a well-planned, progressive exercise program. Related psychological and sociological benefits in self-confidence and mental relaxation and other improvements carry from the therapy to activities of living.
The second major benefit of therapeutic riding is with the psychological state on such areas as self-esteem, self-image, self-confidence and morale. Perception of limitations and capabilities are never the same following the riding experience. The third area of benefit is that of social adjustment, namely in communication and interpersonal skills, with a renewed outgoing mental set. "It is not unusual, especially in the case of autism, for the child to verbally communicate spontaneously for the first time with 'his' horse" (Bream & Spangler, 2001, p. 2).

**Hippotherapy**

Literally, hippotherapy means treatment with the help of a horse. It originates from the Greek word "hippos" meaning horse (Heine & Benjamin, 2000, p. 1). The American Hippotherapy Association, made up of health professionals and others that are interested in the use of equine movement as a treatment tool, is a section of NARHA made up of (NARHA, 2000b). Its mission aims to promote "hippotherapy through the professional growth of physical, occupational and speech-language therapists interested in using the movement of the horse as a tool in treatment" (p. 2). Thus hippotherapy is part of an integrated treatment program to achieve functional outcomes such as impairments, functional limitations, and disabilities in patients with neuromusculoskeletal dysfunction (Heine & Benjamin, 2000, p. 1; NARHA, 2000e).

Heine and Benjamin (2000) are physical therapists and president and secretary of the American Hippotherapy Association. They report that movement of the horse is the tool that therapists use to improve patients' neuromotor function. The therapist must continuously analyze participant responses to different positions astride the horse. The therapist then alters the tempo and direction of the horse as indicated by the responses.
The goals of hippotherapy are to achieve positive effects from the movement of the horse, noted in motor coordination, muscle tone, postural alignment, and strength. Changes are also seen in the respiratory, cognitive, sensory processing, balance, affective, arousal and speech/language production functions. For instance, a participant's respiration and speech may improve following improvements in trunk alignment and motor coordination. System changes are often a direct result of the horse's movement. Changes in speech production can often occur. Because the environment is a natural one, often the challenges associated with being in a non-clinical setting add additional opportunities to make the hippotherapy portion of a treatment beneficial for the participant's community integration. Hippotherapy can be used as a preparatory activity, as a primary tool leading to improve function off the horse, or as a follow-up to other physical therapy procedures done off the horse.

There are guidelines as to the qualifications, responsibilities, and training requirements of therapists wishing to practice hippotherapy. These have been established by the American Hippotherapy Association and approved by NARHA. Therapists providing direct treatment in a hippotherapy program should meet the following qualifications: licensed or registered to practice physical therapy, occupational therapy or speech-language pathology. They should have training in hippotherapy, equine movement, and equine psychology, be a NARHA-registered instructor or have such an instructor assisting with the horse at all sessions. They need to maintain current liability insurance. Other roles for the therapist are consultation, staff and volunteer training in body mechanics, physical and cognitive impairments, basic handling/transfer skills, precautions, and contraindications. They liaison with the medical community, recruit
additional health care professionals and engage in referral of patients/clients. The authors note that many patients, parents, and doctors are requesting hippotherapy as part of a rehabilitation program. More and more therapists are learning about hippotherapy, and are including it in their practice (Heine & Benjamin, 2000).

**The Need for Therapeutic Horseback Riding Research**

Whether one is discussing horseback riding in terms of the human-animal bond, human-animal-interaction, psychomotricity, hippotherapy or any of the various types of therapeutic horseback riding, it is clear that more rigorous research is needed. Studies to describe participants in therapeutic riding as well as to examine effectiveness with various populations, particularly children with varying disabilities should be conducted. In her article about hippotherapy (HPOT), *Gap in Literature: But Does it Really Work?*, Aisenbrey (2000) sums up the need for more research:

> We have few articles in peer-reviewed literature about the most basic information on what occurs during HPOT. As therapists use the tool of HPOT, information is gathered on a daily basis. This information should be shared. It is not only the atypical client and novel treatment approach that needs to be shared, but also customary approaches to commonly seen problems are worth discussing. We lack a collective body of knowledge concerning how long it takes before HPOT has an effect and how long these effects last once HPOT is discontinued. We do not know if there is an optimum frequency and duration of treatment for the various types of clients we see. No profession can generate a scientific basis without a common body of evidence to present to the medical doctors to the insurance companies and to our clients to demonstrate in an objective manner that HPOT works. Then hopefully individuals, like my patient described above, will not be denied the chance of experiencing HPOT. (p. 1)
Animal Assisted Therapy (AAT) or Animal Assisted Activities (AAA) are used effectively in the rehabilitation process of people with varying impairments; however, there is a paucity of research on the therapeutic effects of horseback riding for those with disabilities (All, et al., 1999). Not only may horseback riding produce a calming effect, but it may be an intrinsic motivator to develop self-control in the child with special needs. All et al. (1999) identify the need to develop tools to assess and quantify meaningful improvements in functional outcomes. Studies and instruments measuring changes need to be developed especially studies with larger sample sizes. The synergistic phenomena between humans and animals need to be addressed. Future research should also explore how animals can alter perceptions to people in their environment. "Longitudinal studies that specifically address the psychosocial benefits received from pet-assisted therapy and horseback riding are crucial" (p. 55). The amount of time in a therapeutic riding program does make a difference, and studies should really be longitudinally based. There is evidence that while upon a horse, a child's attitude, signing, taking, touching, feeling, bonding, self discipline, independence, attitude, understanding instructions, and adjustment occur when on horses and may carry over to every day life (All, et al., 1999).

Theoretical Framework for the Study

Children with varying disabilities are a major societal concern and of special importance to special education faculty. Disabilities are long-term or permanent anatomic, physiological or psychological/emotional situations that can be "inherited, congenital, trauma related, or caused by other types of insults on the mind or body caused by disease or illness" (Thompson, 1996, p. 1). A disability is different than a handicap, which is produced by physical and mental barriers within the environment. These
barriers cause the handicap limitations experienced by those with disabilities (Feingold & Feingold, 1984).

An important role of special education faculty is to continuously explore ways to address the special needs of children with disabilities, including those with mental retardation, autism, and physical disability problems, to enhance their adjustment, and maximize their capabilities. The effectiveness of intervention programs on improvement in child behaviors must be ongoing. Children with disabilities often learn to adjust their comfort level by internalizing or externalizing their behavior (Skinner et al., 1999). The synergistic phenomena between humans and animals should be given serious consideration by special education faculty. This study examines human-animal interaction, specifically therapeutic horseback riding and its effectiveness in improving behaviors in children with varying disabilities.

**Contextual-Biopsychosocial Model**

The effectiveness of therapeutic riding is examined within a contextual-biopsychosocial model that serves as the theoretical basis for behavioral assessment in children with disabilities that participate in therapeutic horseback riding. "Each person will adapt or adjust to disability in their way at their own time. Adjustment is seen by many as the function of the congruence between the subjective world of the person and the external environment. If the two fit well, the adjustment should be quicker and better. Additionally, adjustment can be looked at as a process of a succession of situations requiring specific solutions" (Facklam, 2002, p. 1).

*The International Classification of Functioning, Disability and Health (ICF)* integrates various perspectives of functioning through the “biopsychosocial” approach of
health from a biological, individual and social perspective (WHO, 2001a, p. 20). This multi-perspective approach to the classification of functioning and disability is an interactive and evolutionary process. A person's functioning and disability is conceived as a dynamic interaction between health conditions (diseases, disorders, injuries, traumas, etc.) and contextual factors (environmental and personal factors) (WHO, 2001a, p. 8).

There are several educational models and theories that are consistent with the ICF model and applicable to the child with special needs. In Bronfenbrenner's (1977, 1986, 1989) ecological-contextual, human development and systems models, the importance of the micro, meso, and macro system levels of the child's environment for early intervention programs, and the array of services provisions is explained. The microsystem is the immediate and as well as early influences (family, school, friends, religious systems and other closes influences). The mesosystem is an intermediate level of influences (neighborhood and local community, other social institutions and cultural experiences). The macrosystem is farthest, most removed, and least observed such as international and global change. These definitions are consistent with those described in the ICF. Thus, people develop in a variety of contextual environments, and the constant interaction plays an important role in development. Contextual interventions serve to describe the interaction of people in their environmental systems.

By far the most prevalent model in education is the behavioral model. This model emphasizes that environmental or external factors are the cause of school behavior disorders. The medical model emphasizes within-child or internal factors as causes of school behavior disorders (Kauffman, 2001). Special education faculty members are
encouraged to view children in a manner that integrates medical and behavioral models (Kollins et al., 2001).

The integrative ICF and models by Kavale (2000) and others (Kollins et al., 2001; Forness & Kavale, 2001) are similar to Farmer's et al. (2001) holistic developmental model. "From a holistic developmental perspective, the individual functions as an integrated organism, and development arises from the dynamic interrelations among internal and external factors (e.g., behavioral, biophysical, cognitive, contextual, social interactional)" (p. 1). "Such factors influence each other bidirectionally and form an interconnected system of correlated constraints" (p. 1). This leads to the authors' systems perspective of the development of disruptive behavioral disorders (Hussey & Holahan, 2001).

In addition to an integrative contextual-biopsychosocial perspective, assessment should not only encompass prevalent problems, disorders, pathologies or other "deficit-assessment" concepts, but also allow for "strength-based assessment" of children's competencies, skills, abilities and mastery (Epstein & Sharma, 1998; Harniss et al., 1999).

Assessment characteristics should be consistent with U.S. educational standards and public laws and facilitate compliance with the many legal mandates for children with special needs. In describing the development of the Individual Education Plan (IEP), Umansky and Hooper (1998) report that "Efforts to include family members in the assessment process are ever-increasing . . . parents need to view the assessment and intervention as consistent with their perceptions of their child" (p. 367). Parents are usually most knowledgeable about their child's behavior across time and situations.
Therefore, they may be the best sources of data about children competencies (Achenbach, 1991, p. 3).

Kavale (2001) emphasizes the critical importance of an integrative model particularly in special education decisions related to functional behavioral analyses and positive behavioral intervention. For those with disabilities, contextual-environmental interventions aim to be facilitative interactions of people in their environments. One important interaction is the human-animal interaction.

Contextual-Environmental Interaction: Human-Animal Bond, Therapeutic Horseback Riding, and Psychomotricity

Almost any type of animal can help children form strong emotional bonds. Pets may provide "an external focus of attention" (Jennings, 1997, p. 358). AAA might serve as an intrinsic appeal to children. AAA can produce a calming effect on students that can help them focus on learning stimuli. It is this development or the relationship between the child and animal that leads to the greatest benefits in AAA or AAT (Kaufmann, 1997). Professionals are beginning to realize this special ability or talent can be very powerful in helping "at risk" children and children with special needs. Animals can help motivate, encourage learning cooperation and expression. Animals may become a stimulus for exercise, reduce anxiety and provide an external focus of attention. Animals are also a source of comfort and may decrease loneliness and depression while promoting a more interesting environment (Kaufmann, 1997).

Animal contact can be therapeutic (Kaufmann, 1997). The synergistic phenomena between humans and animals should be given serious consideration. The human-animal bond is important to human survival (Jorgenson, 1997). Animal Assisted Therapy (AAT)
is a goal directed intervention in which an animal is an integral part of the treatment process. AAT aims to enhance improvement in physical, psychological, and/or cognitive functioning. It posits that communicative, psychosocial, and academic functioning of children and adolescents with a variety of disabilities can be improved by participating in AAT (Polshuck, 1997).

A specific type of animal-child interaction occurs through therapeutic horseback riding. Therapeutic horseback riding is the use of the horse and equine-oriented activities to achieve a variety of therapeutic goals, including cognitive, physical, emotional, social, educational and behavioral goals. The value of riding is based on the relationship developed between a rider and the horse being ridden and the symbiotic relationship including the therapist (Spink, 1993). Psychomotricity, which aims to promote mind and body integration through movement, can be applied to therapeutic riding (Spink, 1993). Barwick (1986) a French therapist claims psychomotricity reunites a person with self, promotes self-awareness and coexistence with one's environment. It aims at building an individual who becomes able to reflect mental and physical ease and harmony. “Psychomotricity concerns the progressive development of both the mind and body and their interaction under the influence of organic maturation and social stimuli” (Spink, 1993, p. 9). What this means is that the mind and body integration and movement experience and education can be applied to the field of therapeutic riding (Spink, 1993). The therapeutic relationship experienced between the person and the horse (animal-human bond), the caring, and the effort alone helps this symmetry to come together (Barwick, 1986).
In this study, horseback riding as a form of animal assisted therapy is an environmental factor. "The basic construct of the Environmental Factors component is the facilitating or hindering impact of features of the physical, social and attitudinal world" (WHO, 2001a, p. 8). This human-animal interaction, including human-animal bonding and movement (psychomotricity) interacts with other factors, including--personal factors (demographics and type of disability) which together affect biopsychosocial behaviors in children with disabilities. In this study, effectiveness of therapeutic riding is examined from the parent's perspective in five functional categories of child behaviors, which may be improved by therapeutic riding. These categories are, self-care/independence, physical-motor, psychological/emotional, cognitive/school learning, and social communication/interactions. Extraneous variables (in this case, unexplained) are seen as both personal and environmental factors not accounted for in this study. The relationships between horseback riding participation and behavioral effectiveness in children with disabilities are depicted in Figure 1.
Children with disabilities that participate in therapeutic horseback riding and parent assessment of behavioral effectiveness of horseback riding, leads to the research questions under investigation in this study.
Research Questions

1. What are personal factors (demographic and disability) and environmental factors (therapeutic horseback riding) of children that participate in therapeutic riding?

2. What are parent perceptions of effectiveness of therapeutic horseback riding in children with varying disabilities?

3. What are the relationships among demographic, disability, and therapeutic horseback riding factors and parent perceived effectiveness of therapeutic horseback riding in children with disabilities?

Chapter 2 provides a review of the literature of key concepts in this study. The major gap is that there is a limited amount of empirical literature investigating the behavioral effectiveness of therapeutic riding as an animal-human interaction and psychomotricity activity in children with disabilities. The theoretical framework emphasizing a contextual-biopsychosocial approach to assessment of effectiveness, provides the conceptual structure to organize this descriptive and exploratory study. Chapter 3 presents the methodology used to answer the research questions.
CHAPTER 3
RESEARCH METHODOLOGY

Chapter three presents a description of the methodology for this study about parent perceptions of therapeutic horseback riding effectiveness in children with varying disabilities. The research questions, which appear at the end of Chapter 2, evolve from gaps in the literature and the need to describe demographic, disability and horseback riding characteristics of children that participate in riding, as well as to examine the effect of horseback riding on improvement in child behaviors. Relationships among demographic, disability, and therapeutic horseback riding factors and parent perceived effectiveness of therapeutic horseback riding in children with disabilities, is the third research question explored. Chapter 3 begins with a discussion of the research design. The sampling plan and setting, instruments, procedures and data collection methods, evaluation of ethical aspects of the study, and methods of data analyses are presented. This chapter concludes with an evaluation of the research methods used in this study.

Research Design

The three research questions lead to development of a non-experimental survey research study, with descriptive and exploratory purposes. The design primarily uses quantitative methods, however, qualitative methods are also used in data analyses generated by open-ended questions on the survey tool. The research questions are appropriately addressed using both quantitative and qualitative methods. The dependent variable is parent perception of the effectiveness of therapeutic riding on child behaviors. Variables are measured by questions on the Horseback Riding Survey (developed by the
researcher). The independent variables includes personal and contextual factors of demographic data, type of disability, therapeutic horseback riding information, and length of time and frequency in therapeutic riding participation.

The strengths and limitations of this non-experimental survey research design are as follows. The design has the advantage of providing flexibility in implementing a broad-based descriptive and exploratory study about many variables, and their prevalence, distribution and interrelationships. In causal model building, this survey research design provides the opportunity to develop foundational knowledge about disabled children that participate in therapeutic horseback riding. The major limitation is the inability to make clear causal inferences from the data, specifically factors associated with horseback riding effectiveness in children with disabilities. This is primarily due to not conducting an experimental study to examine the effectiveness of therapeutic horseback riding.

Population and Sampling Plan

Target Population

The NARHA web site contains a listing of certified facilities. There are over 600 facilities nationally and 36 in the State of Florida. The target population includes the following:

1. Parents of children (ages 4-19) with disabilities
2. Child disability (or disabilities) that qualifies under PL 94-142 (IDEA) or the State of Florida.
3. Children participate in therapeutic horseback riding in NARHA (North American Riding for the Handicapped Association) certified facilities. This is
a membership organization, which fosters safe, professional, ethical and therapeutic equine activities.

4. Facilities are located in southeastern Florida

**Accessible Population**

To promote feasibility during data collection, specifically travel time, facilities are limited to those within the southeast Florida counties of Broward, Dade and Palm Beach. There are seven NARHA certified facilities in this tri-county area. Of these, six facilities include children aged 4-19. Furthermore, because the researcher is not fluent in another language, parent participants need to be able to read and write in English. This results in the following eligibility criteria for the accessible population:

1. Six NARHA certified facilities in southeastern Florida in the counties of Broward, Dade and Palm Beach
2. Facilities that agree to have parent customers participate in the study and onsite presence of the researcher.
3. One parent has a child or children (ages 4-19) with disabilities. Parent in this case may be a foster parent or legal guardian.
4. Parents willing to participate in the study and complete one survey tool.
5. Child disability (or disabilities) qualifies under PL 94-142 (IDEA) or the State of Florida.
6. Children participate in a therapeutic riding program.
7. Parents are able to read, write and speak English.

A two step, non probability sampling plan is used to obtain the sample of parents of children with disabilities who participate in therapeutic horseback riding.

**Step 1** of the sampling plan aims to identify NARHA certified Horseback riding facilities that agree to participate. Of seven eligible facilities, all were contacted in a
face-to-face meeting. Of the seven facilities, one was excluded because it targeted an older population (ages 21 and over). The remaining six facilities were notified that the research proposal would require approval from Lynn University Institutional Review Board for the Protection of Human Subjects prior to implementing the study. Originally the Child Behavior Checklist (CBCL 4/18) was to be the measure of child behaviors and was reviewed by participating Directors. All six facilities agreed to participate. Permission from each of the facilities was obtained, confirming their interest in participating in the study. Table 4 lists the number of eligible therapeutic riding facilities organized by the three southeast Florida counties that agreed to participate. The number of eligible participants for the study was 159.

Table 4

<table>
<thead>
<tr>
<th>County</th>
<th>Number Meeting Eligibility Criteria</th>
<th>Number Agreeing to Participate</th>
<th>Potential Participants for the Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>County 1</td>
<td>4</td>
<td>4</td>
<td>111</td>
</tr>
<tr>
<td>County 2</td>
<td>1</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>County 3</td>
<td>1</td>
<td>1</td>
<td>33</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6</strong></td>
<td><strong>6</strong></td>
<td><strong>159</strong></td>
</tr>
</tbody>
</table>

Step Two of the sampling plan aims to include eligible parents that agree to participate in the study, a self-selected sample of convenience. Following initial approval by the IRB (February 7, 2002) and revised approval (February 27, 2002), the second step in the sampling plan was implemented. Revisions to the proposal were communicated to
Directors of participating facilities including the change in the measure of effectiveness. Because the sample is self-selected (parents agree to participate), selection bias is present.

Table 5 shows the steps involved in arriving at the final data-producing sample. There were 71 parents that completed the Survey. Of these, seven surveys were excluded from data analysis due to the child’s age greater than 21. The final data-producing sample is 64 resulting in a participation rate of 40.25%. Data collection began February 28, 2002, and continued for month until March 29, 2002.

Table 5
Response Rates Leading to the Data-Producing Sample

<table>
<thead>
<tr>
<th>County Facilities</th>
<th>Number of Eligible Parents</th>
<th>Number of Surveys Completed by Parents</th>
<th>Number of Surveys Included in the Study</th>
<th>Participation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility 1</td>
<td>20</td>
<td>16</td>
<td>16</td>
<td>80.0</td>
</tr>
<tr>
<td>Facility 2</td>
<td>15</td>
<td>11</td>
<td>9</td>
<td>60.0</td>
</tr>
<tr>
<td>Facility 3</td>
<td>27</td>
<td>5</td>
<td>4</td>
<td>14.8</td>
</tr>
<tr>
<td>Facility 4</td>
<td>33</td>
<td>16</td>
<td>12</td>
<td>36.4</td>
</tr>
<tr>
<td>Facility 5</td>
<td>20</td>
<td>11</td>
<td>11</td>
<td>52.3</td>
</tr>
<tr>
<td>Facility 6</td>
<td>44</td>
<td>12</td>
<td>12</td>
<td>27.2</td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>71</td>
<td>64</td>
<td>40.25</td>
</tr>
</tbody>
</table>

Director and instructor interest in the study is the primary factor influencing the parent response rate. One facility has an 80% response rate due to high parent and therapist interest in the study. Whereas the facility with the lowest response rate (14.8%) was due to less interest on the part of the Director to encourage parent participation. The second lowest participation rate (27.2%) was due to the Director’s request that parents that wanted to participate contact the researcher personally. In general, parents that did
not want to participate frequently indicated they wanted to observe or participate in concurrent activities taking place at the facilities. For example, there were horse grooming activities, parades, and Special Olympic practice sessions that parents wanted to observe instead of participating in the study. During data collection, there were also some parents that volunteered to assist with therapy to fill in for absent volunteers. Several of these parents did not want to take the time after therapy to complete the survey due to other commitments. The two step, non probability sampling plan was selected because it is more economical, quicker, and practical than probability sampling plans.

Setting

The settings for data collection are the horseback riding facilities in the tri-county area of south Florida. There were no restrictions placed on the setting where the surveys were completed. A quiet place for each parent to sit down and complete the survey was identified at each facility. Parents generally completed these during the time children were participating in therapeutic riding. In any case, the setting for the study was a natural rather than a laboratory environment. The non-response rate introduces another sampling bias affecting representation of the sample.

Description of Facilities

This study includes six facilities that provide therapeutic horseback riding for people with disabilities. The facilities are located in the southeast Florida tri county area that are Palm Beach, Broward and Dade counties. Although every facility differs, they all have several common characteristics. The most prevalent characteristic is offering instruction to anyone with a special need. Most facilities focus on ways to promote a
better quality of life by building social and physical skills, necessary for adjustment in society.

Most facilities are not-for-profit organizations, and rely heavily upon its volunteer network. Volunteers help with classes, preparation of horse, and facility before class. They have responsibility of grooming, feeding, tacking, bathing and exercising the horses and general upkeep of the barn and premises. Volunteers are necessary, must be trained and are expected to show at their scheduled time as if they are salaried employees. Scheduling of classes as well as daily horse routine is imperative. Hours of operation for most are Monday through Saturday during daylight hours, weather permitting and at various times. All report having waiting lists. Volunteers must go through a training orientation on horse handling and emergency procedures before stepping foot into a stall or aiding in a class.

There are generally a few paid employees. In the facilities for this study, there are about two paid employees who hold titles of director, NARHA certified instructor, barn manager, and secretary. Therapists (occupational, physical, speech) are generally employed by school districts or public or private organizations, and accompany some of the children. Fund raising and donations from major corporations or voluntary associations help keep these programs in existence.

Depending on the amount of independence a child is given in the program, it could take as many as three volunteers per rider. One is called the horse handler. This person grooms and tacks the horse with the proper equipment for each particular child. The horse handler's main responsibility is that of the horse. If a child is thrown or falls, it is the job of the handler to control and remain with the horses in any situation.
program with very dependent children, there is usually a **sidewalker** on each side of the horse as the student is riding. It is the sidewalker's responsibility to report to the handler how the student is progressing. The sidewalker's main responsibility is always the child. A more progressive program may allow better qualified children to ride and handle horses more independently, but there may be a **spotter** for additional protection.

Riding sessions usually range in time from 30, 45, or 60 minutes in length. The time of the session is usually dependent of student variations. Some have better attention spans, or physical abilities which allows them to ride longer, while others may not be able to handle it due to a physical impairment, fear, behavior or time constraint. In one case, there are not enough horses to go around to manage the needs of children, so sessions are of shorter duration to accompany all the students.

Horses must always be physically and mentally sound. It is not always easy to donate a privately owned horse to these organizations. Before each horse is approved for the program, it must be medically evaluated and the past medical history should be available. If it is not, there may be reason to question its soundness. Physically and therapeutically, a horse should be fitted to a child, just as a shoe is fitted to one's foot. A small child should have a smaller horse. An ideal size for a horse, suitable for most children, is about 15 hands.

When three volunteers are used per student riding session, one is a horsehandler and two may be sidewalkers. The horsehandler leads and controls the horse with a lead rope. The sidewalkers are on each side of the horse, and support the child who is riding the horse. A smaller horse is easier for a sidewalk to position and stabilize a child. Smaller horses are also more difficult for the sidewalk. Frequently the sidewalk steps
on the heels of the horsehandler, particularly during a trot, because a smaller horse takes shorter strides. When a small child is on a very large horse, therapeutically, it may not produce the psychomotoric effects. Ponies are ideal for small children. However, because ponies are restricted to smaller bodies, children outgrow their need.

Psychologically, the horses must learn to be aware of their working environment. The horse’s personality must exhibit much patience. Usually, horses come to handicapped organizations to learn a new career. This means their past careers could have been hunting, steeplechase, show jumper, polo, pleasure, thoroughbred racing, or harness racing. There are many horse behaviors that need to be changed to adjust to their new role. They will be faced with a different-paced world. Youngsters are also unpredictable and may make sudden inappropriate movements or noises while on the horse. Therefore, the horse must have a timid or calm personality and not easily be spooked by the unexpected. Horses that seem inherently to sense when to play and when to work are the one is usually acceptable in a therapeutic riding program.

While commonalities exist between the facilities, the six participating facilities have unique characteristics. Variations occur in location, geographic size, number of children serviced, and programs available.

**Facility 1.** This site was formerly a riding academy with a heavy emphasis on horse shows and competition. Some of the horses are owned privately by individuals and loaned to the program for classes. This riding program is designed for children only. It is the newest of the programs. The property is limited to two riding rings and a tranquil serene atmosphere. It is very pretty and also shares the energy by having teenagers present to assist with barn chores and riding lessons. These high school volunteers are
also avid riders and their horse knowledge and experience fits well with the program. Many of these teen volunteers own their horses or take lessons at the facility. This connection to the facility results in their voluntary involvement. The therapists (speech, occupational and physical therapists) have an entirely hands on riding sessions with the kids. Weekly goals are established and progression monitored for the children. Some children participate twice a week, which could be at another facility. Riding is scheduled on Friday and Saturday only. Since this is the newest program, the facility is still acquiring suitable horses. Of 20 eligible parent participants, 16 (80%) participated, yielding the highest participation rate.

**Facility 2.** The facility operates on Saturday only. This site probably is the most structured due to necessity. Only one instructor carries full responsibility. A person has donated his three horses and private property to the therapeutic riding program only. The property is only about two acres including a riding ring. The positive side for the instructor is that she is not responsible for feeding, care-taking, management expense, or responsibility for the horses. The overhead is much lower, the degree of management is less, and a fewer number of volunteers are needed for outside duties. The program still manages to help 24 students per week, including a large Spanish-speaking population, several that were excluded from the study because they were not English speaking. There were two surveys excluded for children older than 21. This resulted in 15 eligible participants, and 9 participated in the study (60%). The Director was very responsive and interested in study participation.

**Facility 3.** This facility is not as scenic as some, but is very lively and easy going. In fact it is difficult to differentiate those with mild disabilities and volunteers since they
all do chores such as care and grooming of animals. There are many farm animals on the
loose, and chaos is common, so the children have more than just horses for interaction.
When they are not riding, they are surrounded by other stimuli. This site is on private
property in an agricultural zone. The owner is also in charge of the program, and allows
the children more freedom to engage in other activities on the land. The same two
therapists are present for all classes. The belief is that all the animals and activities create
a living classroom, and awaken a child's natural curiosity. It is a place to learn about
group responsibility and commitment to one another. Participants in this facility engage
in many community activities, field trips, Special Olympics, and frequently, special
guests are invited to speak. While there are 50 children participants, there were 22
children enrolled under therapy services, independent of the organization. The therapists
for these services did not indicate interest in participation, and stated the parents did not
want to participate. This resulted in 27 accessible to the researcher. Of these, 5 parents
completed the survey, one was excluded due to child age, and 4 were included in the
study. This resulted in a 14.8% participation rate, the lowest in the study. This low
response rate was primarily due to the many activities that parents preferred to participate
in rather than completing surveys.

**Facility 4.** The facility is probably the largest in size of area with suitable
property and an adequate number of horses to accommodate student riding sessions.
There are two riding rings, which all facilities have, but this facility has a sprawling
amount of excess trails. The land is now owned by this non-profit organization to meet
the needs of this program. It is very tranquil and rustic. They are supported by a group
of teen-age equestrians, who provide considerable voluntary help. These teen volunteers
are very active in many program activities including fundraising and helping in Special Olympics competition. This abundance of youth that love to be around horses is as good as striking gold. Their energy and knowledge is more than useful when it comes to normal daily procedures at the barn. They have the time, do not need much guidance and they enjoy being there. They ride at no cost whenever time permits as compensation for their hard work. There are approximately 50 or 60 riding participants with disabilities; however there are more with emotional-social-behavioral problems than physical disabilities. Several are adults who did not qualify for the study. Prior to study implementation, the Director indicated that there might be a low participation rate due to “uninvolved parents” for many of the at-risk children. There were four surveys excluded due to children over 19 of age. Of the 33 eligible parents, 12 participated in the study (36.4%).

Facility 5. The site is located on a privately owned horse farm. It is a very tranquil and beautiful setting. The program is sponsored by a community organization. Of all the horses boarding there, six are privately owned and donated for use in the therapeutic riding program. Overall care of the horse is not the responsibility of the community organization; however, they do provide instructors, volunteers, and overall management of the riding program. There is a large riding ring and an area well suited for parent viewing of their children’s riding. Riding is scheduled on Saturday only. Of 20 eligible parent participants, there were 11 included in the study for a participation rate of 52.3%.

Facility 6. This not-for-profit organization leases public property that has a barn and riding ring. The organization, as the others, relies heavily upon outside funding and
its volunteers. This riding facility has many people on its waiting list, and this has occurred for years. Expansion is a major mission. Expanding means, more horses, volunteers and money. There is minimal use of therapists, with the facility geared more towards recreational therapy. Less documentation of student progress is observed. This facility does not board privately owned horses, nor does it provide private lessons to the public. It is solely for the disabled. There are many healthy retirees in the area who volunteer as opposed to a heavy reliance on teenagers. Most volunteers come for the time they are scheduled, and then leave. However, because there are fewer teen volunteers, it is much more difficult to have someone fill in or help with extra chores when needed. This facility has many available horseback riding trails. Periodically, classes take a scenic ride on these trails. There are approximately 50 to 60 students that ride weekly, with 44 eligible parent participants for the study. Of these, 12 (27.2%) parents participated. The facility Director preferred that the parents contact the researcher if parents were interested in participating in the study. The director sent a notice of the upcoming survey in a newsletter. The director asked parents to contact the researcher for participation details. Interested parents contacted the researcher. If interested, the researcher then had them complete a survey. This produced a lower response rate for this facility.

There are strengths and limitations of the sampling plan. The two step non probability sampling plan was selected because it is more economical, quicker and practical than probability sampling plans. Limiting NARHA certified facilities to those in the southeast Florida region is a limitation and decreases generalizability. However, including all NARHA facilities and eligible participants in the tri-county area in the
accessible population increases representation of the sample. There are only a few facilities and a limited number of parent participants eligible for participation, so randomly selecting facilities as well as participants would have limited the sample size, affected the ability to conduct statistics requiring a sufficient sample size, and increased the sampling error. Another limitation in generalizability to the six facilities in the tri-county area is that parents of children with disabilities that did not read, speak or write in English were excluded. The major limitation with the use of self-selected, convenience sampling is that the available participants may be atypical of the population concerning the study variables measured. Thus, the cost of convenience is the risk of bias and sampling error. However, because eligibility criteria are limited to NARHA facilities and parents of children with disabilities (aged 4-19), the setting and sample under study are more homogeneous. The survey of demographic characteristics further identifies the degree of homogeneity of the study participants, and is presented in Chapter 4. These findings indicate a distribution according to gender, consistent with the population presently at these facilities. While there are no Black participants, few Black children are observed by this researcher. The 40% participation rate may introduce response rate bias. Parents that participated may be more interested in the program as therapy than others. However, this participation rate represents a good portion of the accessible population and is stronger than most previous therapeutic riding studies conducted in the past with very small samples (less than 10 participants) or case studies. The major limitation is in interpreting the study findings and generalizing to other populations based on homogeneity (population validity) and to other settings beyond the tri-county area of southeast Florida (ecological validity) and related external validity (Schmuckler, 2001).
Instrumentation

Horseback Riding Survey

The Horseback Riding Survey is a new tool developed by the researcher to measure the variables under study. The three-page survey is organized into three parts and appears in Appendix A. Part 1 obtains demographic, disability, and horseback riding background information. Part 2 consists of 67 behaviors organized into five behavioral subscales to measure parent perceptions of therapeutic horseback riding effectiveness, and one unidimensional item to measure the parent’s rating of overall effectiveness. Part 3 has three open-ended questions. The survey is a self-report tool that obtains information from parents, other close relatives, and/or guardians of children with disabilities of pre-school and school age. Checklists, circle responses, yes/no responses, fill in the blank, two one rating items and open-ended questions are used. It takes less than 15 minutes to complete. The reading level of the survey was subject to readability statistics until an eighth grade reading level was achieved.

Horseback Riding Survey: Part 1 Demographic, Disability and Horseback Riding Background Information

Part 1 includes personal and environmental factors, specifically horseback riding background information. Demographic variables are “fill-in-the-blank” for gender, age, and race. Questions that relate to disabilities use the 13 categories of disabilities presented in the OSEP Annual Report, Section II Student Characteristics, (2000b). These categories cover Florida Statutes, Title 44 Civil Rights, Chapter 760, Civil Rights Act, although it does not have the specificity of disorders that Florida lists. Disability categories are collapsed in data analyses to depict those primarily with mental
retardation, physical disabilities, and autism/emotional disabilities. Although the U.S. report has children classified into only one of the 13 categories, in order to ascertain co-occurring morbidities, parents were asked to use the list to check any of the 13 problems “your child has”.

Part 1 requests information related to horseback riding in which a checklist is provided to (1) select from six choices the primary way the parent learned about therapeutic riding; and, this is followed by an open ended question for parents to identify secondary ways they learned about the program; and, (2) identify any or all reasons for participation in riding from a list of six choices; and, this also is followed by an open ended question for parents to identify any other reason if not included on the list. This list of reasons is based on the physical, social, emotional, occupational, behavior modification and recreation purposes and goals identified by horseback riding associations (NARHA, 2000a, 2000b). Part 1 further asks parents to report the percent of payment for their child’s participating from six sources. These sources were identified based on discussions with area riding organizations. The length of time of participation in horseback riding (in months) and the number of hours of horseback riding per week were two additional “fill-in-the-blank” questions in Part 1. The last question in Part 1, aimed to assess the child’s interest in therapeutic riding. Parents are asked to rate their child’s interest in participating in horseback riding by circle one of three responses: not interested (assigned a score of 1), somewhat interested (assigned a score of 2), and very interested (assigned a score of 3).

Directions to Parents in completing Part 1: Please respond to every question, following the specific directions for that section or question.
Horseback Riding Survey: Part 2 Parent Ratings of Behavioral Effectiveness

This measure of effectiveness captures a broad range of biopsychosocial behavioral strengths as well as problem behaviors in children with varying disabilities. The literature generally is limited to either physical, or psycho-social tools and a few tools include both strength and deficit based assessment.

The review of the literature identifies many child behaviors that may improve as a result of therapeutic horseback riding. Many of these are included in Part 2 of the Behavioral Effectiveness measure. For the survey, a total of 67 positive and negative behaviors (strengths and deficits) are organized into five subscales of behavioral functioning in children with varying disabilities. They include Self-Care/Independence, (4 behaviors), Physical-Motor (12 behaviors), Psychological-Emotional (31 behaviors), Cognitive/School Learning (9 behaviors), and Social Communication/Interaction (11 behaviors). A five point Likert agreement/disagreement scale is used to measure improvement in each behavior as a result of participation in horseback riding.

In order to establish whether therapeutic riding improves behavior, directions to parents are: “The following statements are a list of child behaviors. Please indicate if you observed an improvement in behaviors since your child began horseback riding. Place one check mark □ next to the behavior in the appropriate box to indicate you either”:

Strongly Agree that the Behavior Improved
Agree that the Behavior Improved
Uncertain or No Change in the Behavior
Disagree that the Behavior Improved
Strongly Disagree that the Behavior Improved

97
A score is assigned for each response: strongly agree (5), agree (4), uncertain or no change (3), disagree (2) and strongly disagree (1). Behaviors are all worded "positively" with higher scores associated with improved behaviors (a positive response). For example, the behavior “less arguing” is worded in such a way that strongly agree (score of 5) is associated with positive improvement in the behavior and lower numbers such as a score of 1, is associated with a negative response. The average of each behavior in the subscale, the average of all behaviors in each subscale, and the total score for each subscale are reported.

In order to establish criterion related validity as well as another measure of effectiveness of horseback riding, at the end of the checklist of behaviors, a single item measure of overall effectiveness is included. Parents are asked: “On the blank line provided below, please rate your perception of the overall effectiveness of therapeutic riding by assigning a rating between 0 and 100, where 0 was equal to no effectiveness at all and 100 = (equals) the highest possible effectiveness”.

**Horseback Riding Survey: Part 3 Open-Ended Questions**

Parents are asked to respond to three open-ended questions regarding therapeutic horseback riding: what they like best, least, and areas they would like to improve.

**Validity of the Horseback Riding Survey: Part 2**

**Parent Ratings of Behavioral Effectiveness**

**Content Validity Based on the Literature**

Part 2 consists of 67 behaviors organized into five behavioral subscales to measure parent perceptions of effectiveness of therapeutic horseback riding. Parents rate improvement in child behavior resulting from therapeutic horseback riding participation.
In addition to these 67 behaviors, parents also rate overall program effectiveness with a single item. The behaviors selected for this measure are based on a thorough review of the literature to select (1) behavioral effectiveness indicators resulting from participation in horseback riding, and (2) child behaviors frequently found in the research literature to validate the behaviors selected. The literature also supports the appropriateness of parent assessments.

Literature from horseback riding programs for the disabled, literature on case studies, Delta Society, NARHA, and animal assisted therapy programs serve to provide the majority of behaviors for the survey. The following discussion provides a list of some of the behaviors on the measure of effectiveness. The list of behaviors is not exhaustive, and there is frequently more than one source of the behaviors. The purpose of this description is to validate the content of behaviors selected from literature sources.


Special education faculty members continuously seek new ways to address the needs of children with disability problems, to enhance their adjustment, and maximize their potential (Skinner et al., 1999). A student web page (Geneseo, 1999) at SUNY identifies many behaviors used in the effectiveness measure pertinent to children with emotional and behavioral disorders. Many of these children experience internalizing behaviors that “reflect a pattern of avoidance of social contact, depressed behavior and/or preoccupation with self. They may have hallucinations, suicidal thoughts, severe restricted activity levels, and they are often excessively teased or verbally/physically abused or avoided by peers. Other behaviors expressed by these children may be externalizing which is a pattern of acting out such as arguing, noncompliance with reasonable requests, patterns of tantrums, exhibiting lack of control, or physical or verbal abuse to others” (Geneseo, 1999, p. 1).

A number of existing instruments vary in structure and content. The Behavioral and Emotional Rating Scale (BERS) allows for strength-based assessment of children with emotional and behavioral disorders (Epstein & Sharma, 1998). It consists of 52 Likert-type items organized in 5 factors of functioning. The subscales are: Interpersonal
Strengths (14 items), Family Involvement (10 items), Intrapersonal Strengths (11 items), School Functioning (9 items) and Affective Strengths (7 items).

The Child Behavior Checklist (CBCL) is part of the ASEBA system (Achenbach & Rescorla, 2001; B’erub’e & Achenbach, 2001). The ASEBA system provides a package of assessment for children. The Teacher's Report Form (TRF), The Youth Self-Report (YSR), the Semistructured Clinical Interview for Children and Adolescents (SCICA) and Child Behavior Checklists (CBCL). The format for the new CBCL/6-18 is similar to the CBCL/4-18 (ASEBA, 2001 and Achenbach & Rescorla, 2001). The CBCL/6-18 is a 118 item parent rating scale, structured to produce scores for three competence scales (Activities, Social, and School), Total Competence, eight syndromes, and Internalizing, Externalizing, and Total Problems. The syndromes scored are Aggressive Behavior; Anxious/Depressed; Attention Problems; Rule-Breaking Behavior; Social Problems; Somatic Complaints; Thought Problems; and Withdrawn/Depressed. In addition to the empirically based scales, there are six DSM-oriented scales constructed which are Affective Problems; Anxiety Problems; Somatic Problems; Attention Deficit/Hyperactivity Problems; Oppositional Defiant Problems; and Conduct Problems.

Another instrument, the Child Symptom Inventory (CSI) (Gadow & Sprafkin, 1994), screens both primary and secondary diagnoses in school settings. The CSI has teacher, parent, and youth self-report versions along with separate levels for preschool, childhood, and adolescence. The CSI-4 includes two rating scales, one completed by the teacher and a second by the parent, to screen 5-12 year olds on common disorders of a psychiatric nature (Gadow & Sprafkin, 1999). The emphasis of this tool is on emotional and behavioral disorders.
The *Conners’ Rating Scale-Revised* (CRS R) also focuses on attention-deficit/hyperactive disorder (ADHD) in children and adolescents. As with the CBCL, revisions to this tool include matching the symptoms for ADHD that are outlined in the DSM-IV (Conners, 2002).

Achenbach and Rescorla (2001) support the need for strength based assessment as well as unique characteristics of the child. "For healthy development, children need to acquire strengths in multiple areas of functioning. Comprehensive assessment should address diverse aspects of adaptive functioning to ensure that strengths as well as needs for help are evaluated. It is helpful to know both the specific competencies characterizing each child and how each child compares with peers in terms of various kinds of competencies" (p. 73).

Epstein, Hertzog, and Reid, (2001) also support the approach of assessment that focus on child’s strengths as most assessments are structured from a deficit perspective emphasizing problems and pathologies. Accurate assessment of children with disabilities is crucial in special education practice for many different reasons, including qualification for services, progress evaluation, and to determine baseline data for selection of instructional interventions. It is important for special education researchers and practitioners to use psychometrically sound assessment instruments that will aid in these critical tasks (Harniss et al., 1999).

When parents find themselves “able to talk about their child’s disability they tend to focus in a more positive manner (Bruner, 1990). Achenbach (1993) consistently asserts, “parents are usually most knowledgeable about their child’s behavior across time and situations” (p.3). In this study which asks parents to reflect back to when their child
first began horseback riding, and report if they observed improvement in behaviors today, the notion that parents are the best source of information to determine effectiveness is validated.

**Content Validity Based on Expert Review**

In addition to validation of content through a literature review, additional content validity is established by the review of the behaviors and their organization into subscales by the researcher's dissertation chair as well as therapists and directors from the horseback riding facilities.

**Criterion-Related Validity**

The method to establish validity of Part 2, *Parent Ratings of Behavioral Effectiveness*, is to provide estimates of criterion-related validity. The aim is to determine if the *Parent Ratings of Behavioral Effectiveness* tool is truly measuring what it is supposed to measure, in this case therapeutic horseback riding effectiveness in behavioral areas. This may be determined by correlating each behavioral score on the tool with another measure. The other criterion selected is the single-item parent “*Overall Rating of Horseback Riding Effectiveness*”. Because the *Parent Rating of Behavioral Effectiveness* and the single-item measure of “overall effectiveness” is measuring the same concept (therapeutic riding effectiveness), the estimate provides concurrent validity.

Pearson $r$ correlation coefficients between each of the 67 items on the *Parent Ratings of Behavioral Effectiveness* scale and the single-item to measure *Overall Effectiveness* show 49 significant correlations ($p = <.05$) establishing concurrent validity. There are also 5 behaviors indicative of a trend ($p > .05-.10$), and 13 items are not significant ($p > .10$). All 12 items on the Physical-Motor Behaviors subscale, and all 11
items on the Social Communication-Interaction subscale are significant ($p =<.05$). For the four items on the Self-Care-Independence Subscale, activities of daily living (ADL) and toileting result in significant correlation coefficients ($p =<.05$), with Personal Grooming indicating a trend ($p = .09$) and Feeding not significant. For the Psychological-Emotional Behavior subscale (31 items), 16 items result in significant correlation coefficients (fewer tantrums, arguing, aggression; less depression and anger; more cooperation, outgoing, satisfaction, motivation, expressing love, calm, and happiness; obedience at school, home, and with others; and improved mood). Three items indicate a trend with $p > .05 -.10$ (self-confidence, attitude, and industrious). Twelve behaviors did not demonstrate significant coefficients with overall effectiveness (Less verbal, physical, and property abuse; fewer fears, withdrawn, lonely, crying, and anxiety; more responsibility and complies to requests; improved self-esteem, and self-image). For the nine items on the Cognitive-School Learning Behavior subscale, eight items result in significant coefficients and one item, (attention) indicates a trend ($p = .10$).

The scale does not appear to be gender or racially biased. There are no significant differences in any of the 67 behaviors according to race (Hispanic versus white/Caucasian); however, no parents of Black children are represented in the survey. Independent t-tests examined differences in improved behavioral effectiveness according to gender. Only three of the 67 items differ significantly using independent t-tests according to gender. Females scores are significantly higher than males on mobility (Physical-Motor subscale) and less lonely and more satisfied (Psychological-Emotional subscale). These results are presented in Chapter 4, Research Question 3.
Reliability of the Horseback Riding Survey: Part 2

Parent Ratings of Behavioral Effectiveness

Two separate analyses using data from the current study, establish internal consistency on the total scale and subscales: Coefficient Alphas (Cronbach) and split-half reliability. Test-retest reliability as a measure of stability was not conducted. The total behavioral effectiveness scale contains 67 items of child behaviors organized into five subscales of child behaviors as follows: Self-Care/Independence (4 items), Physical-Motor Behaviors (12 items), Psychological-Emotional Behaviors (31 items), Cognitive-School Learning Behaviors (9-items), and Social-Communication Interaction Behaviors (11 items).

Inter-Item Correlations (Cronbach’s Coefficient Alphas)

Coefficient alphas using the data obtained from the current study result in very good estimates of reliability ranging from .8735 on the Self-Care/Independence subscale to a high of .9775 on the total scale. The Self-Care / Independence scale only has four items, however the coefficient alpha scores are respectable. These results are shown below:

- Total Effectiveness Scale, with 67 items, Coefficient Alpha of .9775 (n=38)
- Self-Care/Independence Subscale (4 items), Coefficient Alpha .8735 (n=55)
- Physical-Motor Subscale (12 items), Coefficient Alpha .9509 (n=57)
- Psychological-Emotional Subscale (31 items), Coefficient Alpha .9542 (n=53)
- Cognitive-School Learning Subscale (9-items), Coefficient Alpha .9414 (n=58)
- Social Communication/ Interaction Subscale (11 items), Coefficient Alpha .9561 (n=51).
The intercorrelation findings between the subscale and total scale items indicate the *Parent Ratings of Behavioral Effectiveness* items are fairly homogeneous. Taken together the items seem to be measuring the underlying concept of effectiveness.

**Split-Half Reliability**

Split-Half reliability statistics of the subscales is another measure of internal consistency. In this model, the scale is divided into two parts. Analyses include Guttman’s split-half reliability coefficient, coefficient Alphas for each part, and the correlation between the parts. “From a single list of variables, the split-half procedure will compare variables in the first half of the list (the first half is one larger if there are an odd number of items) with variables in the second half of the list” (George & Mallery, 2001, p. 211). In Guttman’s analysis, “this option calculates reliability based on a lower bounds procedure” (p. 211). All reliability coefficients are very good with the exception of the correlation between the two parts of the Self-Care/Independence subscale. This weaker correlation is due to the number of subscale items, which are only two in each part. For the total scale, the Guttman split-half reliability is .9437. The lowest subscale Guttman result is .7999 with the Self-Care subscale. These results are very good measures of reliability as shown in Table 6.
### Table 6

**Split-Half Reliability Estimates for Total Scale and Subscales for the Measure of Behavioral Effectiveness**

<table>
<thead>
<tr>
<th>Scale Part</th>
<th>N of Cases</th>
<th>Number of Scale Items</th>
<th>Guttman Split Half</th>
<th>Alpha for Part One</th>
<th>Alpha for Part Two</th>
<th>Correlation Between the Two Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Scale</td>
<td>38</td>
<td>67</td>
<td>.9437</td>
<td>.9574</td>
<td>.9594</td>
<td>.8935</td>
</tr>
<tr>
<td>Subscales</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Care/Independence</td>
<td>55</td>
<td>4</td>
<td>.7999</td>
<td>.8606</td>
<td>.8408</td>
<td>.6666</td>
</tr>
<tr>
<td>Physical-Motor</td>
<td>57</td>
<td>12</td>
<td>.9403</td>
<td>.9013</td>
<td>.9162</td>
<td>.8894</td>
</tr>
<tr>
<td>Psychological-Emotional</td>
<td>53</td>
<td>31</td>
<td>.9464</td>
<td>.9141</td>
<td>.9131</td>
<td>.8983</td>
</tr>
<tr>
<td>Cognitive/School Learning</td>
<td>58</td>
<td>9</td>
<td>.8827</td>
<td>.9429</td>
<td>.8269</td>
<td>.8300</td>
</tr>
<tr>
<td>Social Communication/Interactions</td>
<td>51</td>
<td>11</td>
<td>.9134</td>
<td>.9046</td>
<td>.9565</td>
<td>.8429</td>
</tr>
</tbody>
</table>

Part 2 of the Horseback Riding Survey is a new parent assessment to measure behavioral improvement in children that participate in therapeutic horseback riding. Content validity is established through the literature and a panel of reviewers. Concurrent validity is established with positive correlations between the child behaviors and overall measure of effectiveness. Internal consistency of the behavioral subscales is very good and provides evidence of reliability.
Procedures: Ethical Considerations and Data Collection Methods

1. Originally, the CBCL/6-18 was to be used as the data collection instrument. This was subsequently changed. However, prior to the change, ASEBA was contacted and sample forms of the CBCL/4-18 and Manual were purchased by the researcher (Spring 2001). In January, 2002, the new and revised ASEBA CBCL/6-18 was purchased along with the Manual. Permission was granted to use the ASEBA CBCL/6-18 on January 22, 2002.

2. Seven Therapeutic Horseback Riding facilities were contacted for interest in participation. They were given a brief overview of the dissertation research, a sample consent form and copy of the CBCL 6/18. They were notified that the discussions were preliminary, and that the study needed to be approved by Lynn University's Institutional Review Board for the Protection of Human Subjects Research before initiation of the study.

3. Facilities were informed that those participating would not be specifically identified in the study. They would be described as southeast Florida NARHA certified horseback riding organizations. They were informed that each participant would need to complete a consent form prior to data collection. The facilities were informed that the two surveys together would take approximately 30 minutes per parent. They were informed that data would be confidential.

4. Facilities were advised that it was preferable that the parents fill out forms during riding sessions, and that the researcher would be present to answer any questions. They were further informed that in the event that parents desired to complete the survey at home, they could do this, pending informed consent is obtained. In this case, a self-addressed envelope to be returned to the researcher would be provided. The researcher was seeking a sample of 100. Facilities were informed that a summary report of aggregate data would be provided to those facilities that participate.

5. If they agreed to participate and allow contact of parents or guardians for this survey research on site, they were asked the following:
• Determine if an IRB is established at the riding facility and if they will also require an IRB review. No facilities had an IRB.

• Facilities should send a letter to the researcher confirming agreement to participate (five were received).

• Provide an estimated number of eligible parent participants to the researcher.

6. Institutional Review Board Application and Approval

• An application for approval of the research study was submitted to the Lynn University Institutional Review Board for the Protection of Human Subjects in Research (IRB), dated 1-24-02.

• The IRB proposal, CBCL 6/18 (research instrument), informed consent and recruitment information was reviewed and IRB approved on February 7, 2002. This approval letter appears in Appendix B).

• The data collection tool was subsequently changed to one developed by the researcher entitled, the Horseback Riding Survey which included a measure of the effectiveness of horseback riding on child behaviors. This also necessitated a revision to the consent form. These were subsequently approved by the IRB on February 27, 2002. This approval letter and the consent form appear in Appendix B.

7. Upon IRB approval, agencies were notified of changes in the title of the study, data collection tool and consent form. Recruitment information was distributed.

8. Data collection was initiated immediately upon IRB approval of the revisions and occurred between the period February 28, 2002 and March 29, 2002.

• Parent consent was sought and obtained by the researcher during the child's riding session. The researcher answered all questions asked. The nature of the information provided to the participants is presented in the Consent Form (Appendix B). The method of documentation of consent is in writing (Signature of participant and witness). Participants were informed that data would be confidential.

• A quiet place at each facility was identified for each parent to sit down and complete the surveys.

• The survey took approximately 15 minutes to complete.
There are no subject identifiers on the survey form.

9. There were no subject identifiers in the data analyses. Confidentiality of survey data will be maintained and stored at the researcher's home in a fireproof safe deposit box. Plans are to destroy the profiles no longer than one year following completion of data collection to allow finalization of the study.

10. Data analysis and finalization of the study occurred.

11. A summary report was submitted to each participating organization that expressed interest in study findings.

The consent form used in this study appears in Appendix B, on two-pages. As developed for parents, it appeared in its entirety on one page.

**Evaluation of Ethical Aspects of the Study**

Preliminary discussions with facility directors including face to face meetings, and providing opportunity for directors to review the survey tool as well as a sample consent form were preliminary activities to assure consideration of ethical aspects of the study were implemented. For study participants, the Consent Form discusses the risks, viewed to be minimal. The survey is equivalent to taking a brief psychological examination and takes less than 15 minutes to complete. In terms of the knowledge gap reported in the literature, there is a potential contribution to the knowledge base on the effectiveness of therapeutic riding for the disabled. There are 30,000 people that participate in horseback riding, and the literature is scant.

The benefits of this study are described, and outweigh risks through a contribution of knowledge. The purposes and procedures for the study are fully described in the consent form. Parent subjects were aware they were participants in a study and had the opportunity to ask or decline participation. Voluntary consent was obtained in a written consent form. Procedures to ensure confidentiality were discussed and will be
maintained. Parent participants had no identifiers. These research activities considered the ethical aspects of this study.

**Methods of Data Analysis**

Following administration and completion of survey forms, data were collected and entered into an SPSS program for statistical analyses. Reliability estimates were determined using Coefficient Alphas and Split-Half Reliability. Criterion related validity was established using a Pearson $r$ correlation. The characteristics of the sample were summarized using descriptive statistics. The research questions were answered by descriptive and inferential statistics. These included measures of central tendency (mean and median), frequency distribution, and range. To determine whether there was improvement in child behaviors as a result of horseback riding participation, one-sample $t$ tests were conducted on all subscale behaviors. To examine differences in groups according to the variables under study, independent $t$-tests (for two-group comparisons) and ANOVA with post-hoc tests (for 3-group comparisons) were used. To examine relationships among the variables correlation coefficients were used. For analysis of qualitative date, a content analysis of responses to organize data was conducted.

**Evaluation of Research Methods**

This is a non-experimental study. There are no active variables. A number of extraneous variables are not accounted for and can interfere with understanding the relationships between the independent variables (personal and environmental demographic, disability and horseback riding information) and the dependent variable of parent perceptions of effectiveness of therapeutic riding on child behaviors in children with disabilities.
The period of data collection as anticipated was one month, and in relative terms, this is not long. Although data were collected at one point in time, maturation and history are threats. History could be a threat because parents were asked to consider changes in behaviors based on their memory when their child first started, and maturation is also a threat because some of the improvements in behaviors could have been due to the normal growth and development process. Any historical event as an intervening extraneous variable could alter parent perceptions.

Homogeneity of the sample is strength, as an attempt was made to rule out some extraneous variables. For example, the sample only includes children with a disability, a certain age (4-19) who participate in NARHA certified horseback riding facilities, and in one geographic area. The age group includes pre-school through high-school ages. Gender may be biased toward males and is limited only to white and Hispanic ethnicity/race. The sample may be underrepresented of children with emotional-behavioral disorders (or at-risk) because many parents of these children were not accessible to the researcher. The geographic area is significant because of south Florida weather, where horseback riding can be year round, and the opportunity for more frequent participant is present. The length of time and frequency of participation is an independent variable.

The survey of demographic factors, horseback riding factors, and disability type are independent variables. Efforts to eliminate variation in responses appear to be met by the clear instructions for items on the survey tool. However, because data collection occurs in a natural environment, situational contaminants may affect responses, and thus threaten the internal validity of the study. Each facility has a quiet place; however, a lot
of activities occur during riding lessons. Because the measure of effectiveness of therapeutic riding on child behaviors is a new tool, this is considered a weakness. However, reliability and validity estimates are good. Data analysis procedures likewise are viewed as strengths in answering the research questions. Appropriate data analyses leads to appropriate interpretations and research conclusions.

The strengths and weaknesses of the sampling plan are described. The major limitation is in interpreting the study findings and generalizing to other populations based on homogeneity (population validity) and to other settings beyond the tri-county area of southeast Florida (ecological validity). These limitations relate to external validity (Schmuckler, 2001). The convenience sample affects generalizing to other populations. While caution is exercised in generalizing to other settings (horseback riding facilities), the description of the settings and their commonalities strengthens generalizability.
CHAPTER 4
RESULTS

In this study about the effectiveness of therapeutic horseback riding in children with disabilities, the results are presented. This chapter presents the research questions and other findings from this study. Methods of data analysis include descriptive and inferential statistics. Qualitative comments by parents are presented by content analysis.

Research Question 1

1. What are personal factors (demographic and disability) and environmental factors (therapeutic horseback riding) of children that participate in therapeutic riding?

Personal Factors: Demographic Background of the Sample

The final data-producing sample (self-selected, convenience) consists of 64 parents who completed the survey. This results in an estimated 40.25% of eligible participants from the six participating agencies in the tri-county area. Children of these parents include 57.8% male and 42.2% female, 70.3% Caucasian/White and 29.7% Hispanics/Latino. There were no black children participating in therapeutic riding on the 20 days the researcher collected data at the agencies. Furthermore, the researcher has observed only three Black children participants at other times the riding facilities were visited. Efforts should be made to attract all children of varying ethnic/racial backgrounds and to encourage more female participation.

The mean age was 10.7 range 4-19, and a median of 10, with the largest represented age group of 9-11 (34.4%) and the smallest age 15-17 (6.3%). Demographic
Data are presented in Table 7. Targeting preschools in early intervention programs should be considered.

Table 7
Demographics of Children Participants in Therapeutic Riding by Gender, Ethnicity and Age

<table>
<thead>
<tr>
<th>Demographic Variables</th>
<th>Number</th>
<th>Percentage</th>
<th>Mean/Median</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>37</td>
<td>57.8</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>27</td>
<td>42.2</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>64</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian/White</td>
<td>45</td>
<td>70.3</td>
<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>19</td>
<td>29.7</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>64</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td>10.7</td>
</tr>
<tr>
<td>Mean Age</td>
<td></td>
<td></td>
<td>10.0</td>
</tr>
<tr>
<td>4-5</td>
<td>6</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td>6-8</td>
<td>15</td>
<td>23.4</td>
<td></td>
</tr>
<tr>
<td>9-11</td>
<td>22</td>
<td>34.4</td>
<td></td>
</tr>
<tr>
<td>12-14</td>
<td>10</td>
<td>15.6</td>
<td></td>
</tr>
<tr>
<td>15-17</td>
<td>4</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>18-19</td>
<td>7</td>
<td>11.0</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>64</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
**Personal Factors: Disabilities or Impairments**

Parents were asked to check any of the problems their child had from a list of 13 disabilities and impairments categories presented on the survey form. These are the disabilities and impairments in the *Second Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act*, Section II Student Characteristics, of children served under IDEA by disability category 1998-99 (cited in OSEP, 2000b, p. 21). The distribution of child disabilities according to these categories is shown in Table 8. While this U.S. report forces a child into one of the 13 categories, it is believed that the true scope of disability types can be lost by such categorization. Thus in this study, parents could check as many disabilities that are applicable to their child. There were 48 (75%) that report more than one disability category indicative of co-occurring disabilities. This is inconsistent with U.S. prevalence rates of one-third of children having co-occurring disabilities. The average number of disabilities checked by each parent is 3.19 disability categories. Study findings of speech/language and learning disabilities as most prevalent disabilities, is consistent with the U.S. report (OSEP, 2000b), as shown in Table 8. The most frequently identified disability category is Specific Learning Disabilities (46.9%) and the least identified disability category is traumatic brain injury (1.6%), which are fairly consistent with the U.S. Report (OSEP, 2000b), shown in Table 8.
Table 8
Disabilities or Impairments of Children Participants in Therapeutic Riding According to IDEA Disability Categories with IDEA Comparisons

<table>
<thead>
<tr>
<th>Variable: Disability Category</th>
<th>Study Sample All Categories that Apply to Child N= 64</th>
<th>Study Sample Percentage</th>
<th>1998-99 IDEA One-Category Per Child Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Learning Disabilities</td>
<td>30</td>
<td>46.9</td>
<td>50.8</td>
</tr>
<tr>
<td>Speech and Language Impairments</td>
<td>29</td>
<td>45.3</td>
<td>19.4</td>
</tr>
<tr>
<td>Mental Retardation</td>
<td>21</td>
<td>32.8</td>
<td>11.0</td>
</tr>
<tr>
<td>Emotional Disturbance</td>
<td>6</td>
<td>9.4</td>
<td>8.4</td>
</tr>
<tr>
<td>Multiple Disabilities</td>
<td>26</td>
<td>40.6</td>
<td>1.9</td>
</tr>
<tr>
<td>Hearing Impairments</td>
<td>4</td>
<td>6.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Orthopedic Impairments</td>
<td>21</td>
<td>32.8</td>
<td>1.3</td>
</tr>
<tr>
<td>Other Health Impairments</td>
<td>9</td>
<td>14.1</td>
<td>4.0</td>
</tr>
<tr>
<td>Visual Impairments</td>
<td>7</td>
<td>10.9</td>
<td>0.5</td>
</tr>
<tr>
<td>Autism</td>
<td>27</td>
<td>42.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Deaf-Blindness</td>
<td>4</td>
<td>6.3</td>
<td>&gt;0.1</td>
</tr>
<tr>
<td>Traumatic Brain Injury</td>
<td>1</td>
<td>1.6</td>
<td>0.2</td>
</tr>
<tr>
<td>Developmental Delay</td>
<td>20</td>
<td>31.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>

In order to perform comparative analyses of data, three prevalent groups of disabilities are identified corresponding to physical, mental and emotional disorders: Physical Disabilities, Mental Retardation, and Autism. Any child with autism automatically is placed in the “autism category” category regardless of other disabilities.
Any child with mental retardation (without autism) is placed in the mental retardation category. Any child with physical disabilities (and without autism and without mental retardation) is placed in the physical disability category. Based on these definitions, each child is “exclusively” placed into one of these three major types of disability categories resulting in: 42.2% Autism, 23.4% Mental Retardation and 34.4% Physical Disabilities as shown in Table 9. To consolidate groups for further data analysis, the physical disabilities and mental retardation groups are combined (57.8%) and Autism (42.2%) is kept separate, as shown in Table 9. The rationale is that many mentally retarded children have physical disabilities and are grouped together in the school system and, autistic children are generally grouped together in the school system, solely by their diagnosis of autism.
Table 9
Disabilities or Impairments of Children Participants in Therapeutic Riding According to Three and Two Group Disability Categories (N=64)

<table>
<thead>
<tr>
<th>Disability Category</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Three Disability Category Groups</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autism (may have other disabilities)</td>
<td>27</td>
<td>42.2</td>
</tr>
<tr>
<td>Mental Retardation (without autism)</td>
<td>15</td>
<td>23.4</td>
</tr>
<tr>
<td>Physical Disabilities (without mental retardation or autism and at least one physical disability)</td>
<td>22</td>
<td>34.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>64</td>
<td>100</td>
</tr>
<tr>
<td><strong>Two Disability Category Groups</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autism (may have other disabilities)</td>
<td>27</td>
<td>42.2</td>
</tr>
<tr>
<td>Physical Disabilities and or/ Mental Retardation</td>
<td>37</td>
<td>57.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>64</td>
<td>100</td>
</tr>
</tbody>
</table>

**Environmental Factors: Therapeutic Horseback Riding**

Environmental factors related to therapeutic horseback riding include how parents learned about riding program, reasons they have their child participate, how riding is financed, length of time in months and hours per week of participation in horseback riding and the child’s interest in the horseback riding program.

**Method Parents Learned About Therapeutic Horseback Riding**

Parents select one primary way they learned about therapeutic riding from a list of six choices. Their primary choice is word of mouth (43.7). There are 25% that report a medical or health referral. It should be noted that parents learn more about therapeutic riding from word of mouth than from school or medical/health referrals combined.
Schools and medical/health referrals are the primary ways that horseback riding could be written into an IEP. There are two parents that identify more than one primary way they learned about the riding as shown in Table 10.

Table 10

*Primary Way Parent Learned About Therapeutic Horseback Riding*

<table>
<thead>
<tr>
<th>Methods of Learning About Riding</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word of Mouth</td>
<td>28</td>
<td>43.7</td>
</tr>
<tr>
<td>Medical or Health Referral</td>
<td>16</td>
<td>25.0</td>
</tr>
<tr>
<td>School Referral</td>
<td>9</td>
<td>14.1</td>
</tr>
<tr>
<td>Newspaper or Ad</td>
<td>4</td>
<td>6.3</td>
</tr>
<tr>
<td>Selected More than One Method</td>
<td>3</td>
<td>4.6</td>
</tr>
<tr>
<td>(School/Medical Referral; and News/Word of Mouth)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attended an Event</td>
<td>2</td>
<td>3.1</td>
</tr>
<tr>
<td>Drive By</td>
<td>1</td>
<td>1.6</td>
</tr>
<tr>
<td>Did Not respond</td>
<td>1</td>
<td>1.6</td>
</tr>
<tr>
<td>Total</td>
<td>64</td>
<td>100</td>
</tr>
</tbody>
</table>

*Reason(s) Child Participates in Therapeutic Horseback Riding*

Parents identify the reason(s) for their child’s participation in therapeutic riding from a list of six choices as well as any other reasons not included on the list. They could check all reasons that apply. One parent indicates the child likes horses as the reason for participation. The most common reasons are physical (73.4%) and recreational (70.3%), and the least common is behavioral modification (29.7%). The average number of reasons selected is 3.38 (range 1-6), with 46.9% identifying between three and four reasons for participation, as shown in Table 11.
Table 11

Reasons for Participation in Therapeutic Horseback Riding N=64

<table>
<thead>
<tr>
<th>Reasons for Participation</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>47</td>
<td>73.4</td>
</tr>
<tr>
<td>Recreational</td>
<td>45</td>
<td>70.3</td>
</tr>
<tr>
<td>Social</td>
<td>40</td>
<td>62.5</td>
</tr>
<tr>
<td>Occupational</td>
<td>37</td>
<td>57.8</td>
</tr>
<tr>
<td>Emotional</td>
<td>26</td>
<td>40.6</td>
</tr>
<tr>
<td>Behavior Modification</td>
<td>19</td>
<td>29.7</td>
</tr>
</tbody>
</table>

Total Number of Reasons Selected for Participating in Horseback Riding

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>18</td>
<td>28.1</td>
</tr>
<tr>
<td>3-4</td>
<td>30</td>
<td>46.9</td>
</tr>
<tr>
<td>5-6</td>
<td>16</td>
<td>25.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

**Financing Therapeutic Horseback Riding**

Parents indicate what percent of payment for their child’s participation in therapeutic horseback riding comes from six sources (with responses totaling 100%). In some instances, parents did not indicate a percentage. In these cases where one source was identified, 100% is coded as the response. In instances where two sources are identified, 50% is coded for each response. In instances where three sources are identified, 33½% is coded for each response. Of the six choices, free/no charge (39.2%) and community organization (25.8%) account for 65% of financing for the program. The least identified source is school program, accounting for 2.3% of funding shown in Table
12. There are 46 (71.9%) that identify one source and 18 (28.1%) that identify two sources of financing.

Table 12

<table>
<thead>
<tr>
<th>Source of Financing</th>
<th>Number</th>
<th>Percentage</th>
<th>Percentage of Payment from Each Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Pay Total Amount</td>
<td>9</td>
<td>14.1</td>
<td>14.1</td>
</tr>
<tr>
<td>Self-Pay Partial Amount</td>
<td>18</td>
<td>28.1</td>
<td>13.9</td>
</tr>
<tr>
<td>Insurance</td>
<td>6</td>
<td>9.4</td>
<td>4.7</td>
</tr>
<tr>
<td>School Program</td>
<td>3</td>
<td>4.7</td>
<td>2.3</td>
</tr>
<tr>
<td>Community Organization</td>
<td>18</td>
<td>28.1</td>
<td>25.8</td>
</tr>
<tr>
<td>Free/No Charge</td>
<td>28</td>
<td>43.8</td>
<td>39.2</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Length of Time in Participation in Horseback Riding

Parents report the number of months that their children participated in horseback riding as well as the number of hours per week of horseback riding participation. The average number of months of participation is 36.5 (range 1-162) in which case the median is a more appropriate statistic (24 months). There are 26.6% reporting 13-24 months of riding and 10.9% reporting riding participation more than five years. Parents report four different lengths of time for a riding lesson ranging, from $\frac{1}{2}$ hour to 2 hours. The average length of time for a riding lesson is .99 hours, consistent with the median of one hour. There are 73.5% that report a one-hour time riding lesson period, as shown in Table 13.
Table 13

*Time in Participation in Horseback Riding: Number of Months and Hours Per Week*

<table>
<thead>
<tr>
<th>Participation in Horseback Riding</th>
<th>Number</th>
<th>Percentage</th>
<th>Mean</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Time in Months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Month to 12 Months</td>
<td>16</td>
<td>25.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 Months to 24 Months</td>
<td>17</td>
<td>26.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 Months to 36 Months</td>
<td>9</td>
<td>14.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37 Month to 48 Months</td>
<td>10</td>
<td>15.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49 Months to 60 Months</td>
<td>5</td>
<td>7.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 5 years</td>
<td>7</td>
<td>10.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Hours Per Week                   |        |            |      |        |       |
| ½ Hour                           | 10     | 15.6       |      |        |       |
| ¾ Hour                           | 2      | 3.1        |      |        |       |
| 1 Hour                           | 47     | 73.5       |      |        |       |
| 2 Hours                          | 5      | 7.8        |      |        |       |
| **Total**                        | 100    |            |      |        |       |

*Child’s Interest in Horseback Riding Program*

Parents rate their child’s interest in participating in the horseback riding program. Each response category is assigned a score of 3 (very interested), 2 (somewhat interested), and 1 (not interested), resulting in a mean rating of 2.84. There are 85.9% who report their child is very interested in participating as shown in Table 14.
Table 14

Child's Interest in Participating Horseback Riding

<table>
<thead>
<tr>
<th>Interest in Participation in Horseback Riding</th>
<th>Number</th>
<th>Percentage</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Interested</td>
<td>55</td>
<td>85.9</td>
<td></td>
</tr>
<tr>
<td>Somewhat Interested</td>
<td>8</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>Not Interested</td>
<td>1</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>64</td>
<td>100</td>
<td>2.84</td>
</tr>
</tbody>
</table>

Summary of Demographic, Disability, and Horseback Riding Information (Research Question 1)

Findings indicate the majority of children with disabilities participating in therapeutic horseback riding are white males, ranging in age from 6 to 11. It is suggested that efforts be made to attract more Black children, more females and younger (pre-school) children into riding programs. A variety of predominant disabilities reported are: specific learning, speech and language, orthopedic, developmental delay and autism. These disabilities and impairments are consistent with those identified in the Second Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act, Section II Student Characteristics, of children served under IDEA by disability category 1998-99 (cited in OSEP, 2000b, p. 21). However, this study finds a higher prevalence of mental retardation, orthopedic and autism because parents report all problems. There are 59% with physical and mental retardation disabilities and 41% with autism. It is strongly suggested that the U.S. assess all possible co-occurring disabilities in order to more fully understand the scope of disabilities in children.
The primary way parents learn of therapeutic riding is by word of mouth. It is suggested that schools have more awareness of horseback riding as a viable therapy including integration into with the special education program, as well as encouraging riding as an extracurricular program activity. Reasons for participating in the riding programs are diverse. The most prevalent reasons are physical and recreation purposes. The multiple reasons for participation are consistent with goals of NARHA riding organizations. Riding is reported to be 65% financed as free or a community organization. The median length of riding experience is 24 months, with 1 hour per week as the average length of the riding lesson. Parents overwhelmingly report children are “very interested” in participating in the horseback riding programs.

Research Question 2

2. What are parent perceptions of effectiveness of therapeutic horseback riding in children with varying disabilities?

Parent participants reflect as to whether they observe improvement in 67 behaviors since their child began horseback riding. Response categories on a Likert Scale are each assigned a score for data analyses: Strongly Agree (5), Agree (4), Uncertain or No Change (3), Disagree (2), and Strongly Disagree (1). The behaviors are grouped into five category subscales Self Care/Independence, Physical-Motor, Psychological/Emotional, Cognitive/School Learning, and Social Communication Interactions, which are subscales of the “Horseback Riding Survey – Part 2, Parent Ratings of Behavioral Effectiveness.” The number of respondents per item range from 54 to 64.
A number of analyses determine effectiveness of therapeutic horseback riding including: frequency distributions of responses and a mean score for each behavior (range 1-5). In addition, the average score of all items in the behavioral subscale (range 1-5) and the average total score for each subscale are computed. To determine whether horseback riding is effective in improving each of the behaviors, one-sample t tests compare the mean score for each behavior to a score of “3” representing the Uncertain or No Change point on the survey tool. Results indicate each behavior is significantly greater than a score of 3 using a one-sample t-test \((p<.05)\). To better discriminate which behaviors improve the most, one-sample t tests compare the mean score for each behavior to a score of “3.5”, representing the range between “Uncertain or No change point to “Agree” on the survey tool. This results in significant \(t\)-values \((p = < .05)\) for 27 of the 67 behavioral items, indicating a statistical difference between observed means and a score of 3.5. Seven behavior scores average greater than 4.0 indicating areas of greatest improvement. These include: range of motion, mobility, balance, posture (physical-motor subscale) and self-esteem, self-confidence and self-image (psychological-emotional subscale). Results for each subscale follows.

**Effectiveness: Self-Care/Independence Behaviors Improved**

The data in Table 15 show the results of the four items on the Self-Care/Independence Behavior subscale. The highest rated item is improvement in “taking care of self” (3.38), and the lowest rated item is improvement in “toileting” (3.18). The average rating for the subscale is a 3.30, the lowest average of all subscales. There are no significant improvements using the one-sample \(t\)-tests compared to a mean score of 3.5, since all behavior scores are less than 3.5. These findings do not lend support of the
beneficial effects of therapeutic riding on very basic activities of daily living in children with disabilities.

Table 15

*Parent Perception of Effectiveness in Improved Self-Care/Independence Behaviors: Frequency Distributions, Means, Total Score, and One-Sample t-tests N=56-60*

<table>
<thead>
<tr>
<th>Behaviors</th>
<th>Percentage Distribution</th>
<th>Mean</th>
<th><em>t</em>^b^</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
<td>U/NC</td>
</tr>
<tr>
<td>Taking Care of Self</td>
<td>3</td>
<td>36</td>
<td>49</td>
</tr>
<tr>
<td>Personal Grooming</td>
<td>3</td>
<td>31</td>
<td>55</td>
</tr>
<tr>
<td>Feeding Self</td>
<td>2</td>
<td>26</td>
<td>55</td>
</tr>
<tr>
<td>Toileting</td>
<td>3</td>
<td>17</td>
<td>59</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average Rating for Subscale</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Subscale Total</td>
<td>3.30</td>
</tr>
<tr>
<td></td>
<td>13.19</td>
</tr>
</tbody>
</table>

^aSA = Strongly Agree, A = Agree, U/NC = Uncertain / No Change, D = Disagree, SD = Strongly Disagree.

^bOne sample t-test for mean >3.5. Positive t values for means => 3.5 and negative t values for means < 3.5.

*^p = <.05. **^p < .01. ***^p < .001.

*Effectiveness: Physical-Motor Behaviors Improved*

The data in Table 16 show the results of the 12 items on the Physical-Motor Behavior subscale. The highest rated item is improvement in “postural control” (4.25) and the lowest rated item is improvement in “fewer body complaints” (3.38). The average rating for the subscale is a 3.87 (the highest subscale average). Eight behavioral items indicate significant improvement using the one-sample t-tests compared to a mean score of 3.5. These include range of motion, muscle strength, mobility, balance, postural
control, coordination, muscle tone, and physical ease (\( \leq p \leq .001 \)). These findings support the notion of the beneficial effects of therapeutic horseback riding on physical-motor development in children with disabilities.

Table 16

*Parent Perception of Effectiveness in Physical-Motor Behaviors: Frequency Distributions, Means, Total Score, and One-Sample t-tests N=(58-64)*

<table>
<thead>
<tr>
<th>Physical-Motor Behaviors</th>
<th>Percentage Distribution</th>
<th>Mean</th>
<th>t&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Likert Scale Response Categories&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
<td>U/NC</td>
</tr>
<tr>
<td>Range of Motion</td>
<td>23</td>
<td>60</td>
<td>17</td>
</tr>
<tr>
<td>Muscle Strength</td>
<td>27</td>
<td>45</td>
<td>28</td>
</tr>
<tr>
<td>Mobility</td>
<td>25</td>
<td>56</td>
<td>17</td>
</tr>
<tr>
<td>Balance</td>
<td>33</td>
<td>48</td>
<td>17</td>
</tr>
<tr>
<td>Postural Control</td>
<td>34</td>
<td>55</td>
<td>9</td>
</tr>
<tr>
<td>Coordination</td>
<td>27</td>
<td>42</td>
<td>31</td>
</tr>
<tr>
<td>Muscle Tone</td>
<td>26</td>
<td>44</td>
<td>30</td>
</tr>
<tr>
<td>Ambulate/Walking</td>
<td>16</td>
<td>31</td>
<td>45</td>
</tr>
<tr>
<td>Manual Dexterity</td>
<td>14</td>
<td>27</td>
<td>50</td>
</tr>
<tr>
<td>Physical Ease</td>
<td>17</td>
<td>44</td>
<td>36</td>
</tr>
<tr>
<td>Energy Level</td>
<td>11</td>
<td>29</td>
<td>55</td>
</tr>
<tr>
<td>Fewer Body Complaints</td>
<td>11</td>
<td>14</td>
<td>70</td>
</tr>
</tbody>
</table>

| Average Rating for Subscale | 3.87 |
|                            |     |
| Subscale Total             | 46.46 |

<sup>a</sup>SA = Strongly Agree, A = Agree, U/NC = Uncertain / No Change, D = Disagree, SD = Strongly Disagree.

<sup>b</sup>One sample t-test for mean \( \geq 3.5 \). Positive \( t \) values for means \( > 3.5 \) and negative \( t \) values for means \( < 3.5 \).

\( *p \leq .05 \). \( **p \leq .01 \). \( ***p \leq .001 \).
Effectiveness: Psychological/Emotional Behaviors Improved

Data in Table 17 show the results of the 31 items on the Psychological/Emotional Behavior subscale. The highest rated item is improvement in "self-esteem" (4.2) and the lowest rated item is improvement in "fewer episodes of physical abuse to property" (3.13). The average rating for the subscale is a 3.58. Nine behavioral items indicate significant improvement using the one-sample t-tests compared to a mean score of 3.5. These include self-esteem cooperates (less stubborn), satisfaction, motivation, self-confidence, self-image, positive attitude, happiness (morale) and sense of calm (<= p .01). These findings support the notion of the beneficial effects of therapeutic horseback riding on psychological-emotional well-being in children with disabilities, particularly on one's affect. Findings do not support therapeutic effects of horseback riding in children with disabilities on inappropriate internalizing and externalizing behaviors such as fears, anxiety, withdrawal, aggression, arguing, abuse and obedience. Table 17 appears on the following two pages.
## Table 17

**Parent Perception of Effectiveness in Psychological/ Emotional Behaviors: Frequency Distributions, Means, Total Score, and One-Sample t-tests N= 56-61**

<table>
<thead>
<tr>
<th>Psychological/ Emotional Behaviors</th>
<th>Percentage Distribution</th>
<th>Mean</th>
<th>$t^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Likert Scale Response Categories$^a$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
<td>U/NC</td>
</tr>
<tr>
<td>Less Anxious</td>
<td>11</td>
<td>41</td>
<td>42</td>
</tr>
<tr>
<td>Less Depressed</td>
<td>6</td>
<td>22</td>
<td>63</td>
</tr>
<tr>
<td>Less Aggressive</td>
<td>5</td>
<td>28</td>
<td>56</td>
</tr>
<tr>
<td>Less Withdrawn</td>
<td>6</td>
<td>38</td>
<td>48</td>
</tr>
<tr>
<td>Less Sudden Crying</td>
<td>5</td>
<td>25</td>
<td>58</td>
</tr>
<tr>
<td>Less Anger</td>
<td>6</td>
<td>23</td>
<td>60</td>
</tr>
<tr>
<td>Less Loneliness</td>
<td>8</td>
<td>25</td>
<td>58</td>
</tr>
<tr>
<td>Less Arguing</td>
<td>4</td>
<td>22</td>
<td>64</td>
</tr>
<tr>
<td>Fewer Mood Swings</td>
<td>5</td>
<td>23</td>
<td>61</td>
</tr>
<tr>
<td>Fewer Episodes of Tantrums</td>
<td>4</td>
<td>22</td>
<td>58</td>
</tr>
<tr>
<td>Fewer Episodes of Verbal Abuse to Others</td>
<td>3</td>
<td>13</td>
<td>71</td>
</tr>
<tr>
<td>Fewer Episodes of Physical Abuse to Others</td>
<td>4</td>
<td>13</td>
<td>72</td>
</tr>
<tr>
<td>Fewer Patterns of Abuse to Property</td>
<td>3</td>
<td>6</td>
<td>75</td>
</tr>
<tr>
<td>Fewer Episodes Fears</td>
<td>6</td>
<td>30</td>
<td>54</td>
</tr>
<tr>
<td>Complies with Reasonable Requests</td>
<td>8</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Outgoing (less shy)</td>
<td>12</td>
<td>39</td>
<td>42</td>
</tr>
<tr>
<td>Obedience at School</td>
<td>8</td>
<td>34</td>
<td>50</td>
</tr>
<tr>
<td>Obedience at Home</td>
<td>6</td>
<td>36</td>
<td>49</td>
</tr>
</tbody>
</table>

Continued Next Page
Table 17

Parent Perception of Effectiveness in Psychological/Emotional Behaviors: Frequency Distributions, Means, Total Score, and One-Sample t-tests N = 56-61

<table>
<thead>
<tr>
<th>Psychological/Emotional Behaviors</th>
<th>Percentage Distribution</th>
<th>Likert Scale Response Categories</th>
<th>Mean</th>
<th>t^b</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SA</td>
<td>A</td>
<td>U/NC</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------------------</td>
<td>----</td>
<td>---</td>
<td>------</td>
</tr>
<tr>
<td>Obedience at Social Functions</td>
<td></td>
<td>9</td>
<td>36</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.58</td>
<td>.84</td>
<td></td>
</tr>
<tr>
<td>Self-Esteem</td>
<td></td>
<td>29</td>
<td>55</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.20</td>
<td>8.67***</td>
<td></td>
</tr>
<tr>
<td>Cooperates (Less Stubborn)</td>
<td></td>
<td>14</td>
<td>45</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.78</td>
<td>2.98**</td>
<td></td>
</tr>
<tr>
<td>Satisfaction</td>
<td></td>
<td>20</td>
<td>48</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.93</td>
<td>4.82***</td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td></td>
<td>22</td>
<td>45</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.93</td>
<td>4.66***</td>
<td></td>
</tr>
<tr>
<td>Self-Confidence</td>
<td></td>
<td>30</td>
<td>48</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.13</td>
<td>7.09***</td>
<td></td>
</tr>
<tr>
<td>Self-Image</td>
<td></td>
<td>27</td>
<td>44</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.03</td>
<td>5.62***</td>
<td></td>
</tr>
<tr>
<td>Positive Attitude</td>
<td></td>
<td>20</td>
<td>47</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.92</td>
<td>4.57***</td>
<td></td>
</tr>
<tr>
<td>Taking Responsibility</td>
<td></td>
<td>16</td>
<td>31</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.67</td>
<td>1.72</td>
<td></td>
</tr>
<tr>
<td>Expressing Love</td>
<td></td>
<td>12</td>
<td>38</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.68</td>
<td>1.94</td>
<td></td>
</tr>
<tr>
<td>Industrious</td>
<td></td>
<td>12</td>
<td>19</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.47</td>
<td>-.35</td>
<td></td>
</tr>
<tr>
<td>Happiness (Morale)</td>
<td></td>
<td>15</td>
<td>36</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.73</td>
<td>2.38*</td>
<td></td>
</tr>
<tr>
<td>Sense of Calm</td>
<td></td>
<td>14</td>
<td>41</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.73</td>
<td>2.54*</td>
<td></td>
</tr>
<tr>
<td>Average Rating for Subscale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subscale Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^aSA = Strongly Agree, A = Agree, U/NC = Uncertain / No Change, D = Disagree, SD = Strongly Disagree.

^bOne sample t-test for mean > 3.5. Positive t values for means => 3.5 and negative t values for means < 3.5.

*p = < .05. **p < .01. ***p < .001.

**Effectiveness: Cognitive Behaviors /School Learning Improved**

Data in Table 18 show the results of the nine items on the Cognitive Behaviors/School Learning subscale. The highest rated item is improvement in
“attention skills/attention span” (4.2), and the lowest rated item is improvement in “school grades” (3.43). The average rating for the subscale is a 3.55. Most scores are consistently around the 3.5 score range. “Attention skills/attention span” is the only behavioral item indicative of significant improvement using the one-sample t-tests compared to a mean score of 3.5 ($p = .055$). This finding supports the notion of the potential beneficial effects of therapeutic horseback riding on children with attention deficit disorders. Only one child is identified as ADHD by parents on the survey tool.

Table 18

*Parent Perception of Effectiveness in Cognitive Behaviors/ School Learning: Frequency Distributions, Means, Total Score, and One-Sample t-tests N=59*

<table>
<thead>
<tr>
<th>Cognitive Behaviors/ School Learning</th>
<th>Percentage Distribution</th>
<th>Mean</th>
<th>$t^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Likert Scale Response Categories$^a$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
<td>U/NC</td>
</tr>
<tr>
<td>Memory</td>
<td>8</td>
<td>33</td>
<td>51</td>
</tr>
<tr>
<td>Attention Skills/ Span</td>
<td>8</td>
<td>45</td>
<td>39</td>
</tr>
<tr>
<td>Concentration</td>
<td>9</td>
<td>41</td>
<td>42</td>
</tr>
<tr>
<td>Learning</td>
<td>6</td>
<td>38</td>
<td>48</td>
</tr>
<tr>
<td>Alertness</td>
<td>8</td>
<td>36</td>
<td>78</td>
</tr>
<tr>
<td>Decision-making</td>
<td>5</td>
<td>34</td>
<td>53</td>
</tr>
<tr>
<td>Self-Discipline</td>
<td>6</td>
<td>41</td>
<td>45</td>
</tr>
<tr>
<td>Self-Control</td>
<td>8</td>
<td>37</td>
<td>47</td>
</tr>
<tr>
<td>School Grades</td>
<td>6</td>
<td>28</td>
<td>55</td>
</tr>
<tr>
<td>Average Rating for Subscale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subscale Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^a$SA = Strongly Agree, A = Agree, U/NC = Uncertain / No Change, D = Disagree, SD = Strongly Disagree.

$^b$One sample t-test for mean $>3.5$. Positive $t$ values for means $>3.5$ and negative $t$ values for means $<3.5$.

*p = <.05. **p < .01. ***p < .001.
Effectiveness: Social Communication/Interaction Behaviors Improved

Data in Table 19 show the results of the 11 items on the Social Communication/Interaction Behavior subscale. The highest rated items are improvement in “giving” and “receiving” information (3.97), and the lowest rated item are improvement in “plays well with others” (3.60). All items are rated equal or greater than 3.60. The average rating for the subscale is a 3.77. Nine of the 11 behavioral items indicate significant improvement using the one-sample \( t \)-tests compared to a mean score of 3.5, the highest percentage of significant items on any subscale. These include giving and receiving information, expressing self appropriately, getting along with friends, family, teachers and therapists, plays and works alone well and participates well in sports, hobbies and clubs. (\( p < .05 \)). These findings support the notion of the beneficial effects of therapeutic horseback riding on social well-being in children with disabilities, including communication and social interactions.
Table 19

Parent Perception of Effectiveness in Social Communication Interactions: Frequency Distributions, Means, Total Score, and One-Sample t-tests N = (55-61)

<table>
<thead>
<tr>
<th>Social Communication/Interaction Behaviors</th>
<th>Percentage Distribution</th>
<th>Mean</th>
<th>( t^b )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Likert Scale Response Categories ( ^a )</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
<td>U/NC</td>
</tr>
<tr>
<td>Give Information (Expressive)</td>
<td>20</td>
<td>47</td>
<td>24</td>
</tr>
<tr>
<td>Receive Information (Receptive)</td>
<td>20</td>
<td>49</td>
<td>23</td>
</tr>
<tr>
<td>Expressing Self Appropriately</td>
<td>19</td>
<td>34</td>
<td>38</td>
</tr>
<tr>
<td>Gets Along with Brothers and Sisters</td>
<td>9</td>
<td>39</td>
<td>35</td>
</tr>
<tr>
<td>Gets Along with Other Friends</td>
<td>11</td>
<td>48</td>
<td>33</td>
</tr>
<tr>
<td>Gets Along with Family</td>
<td>11</td>
<td>44</td>
<td>37</td>
</tr>
<tr>
<td>Gets Along with Teachers</td>
<td>12</td>
<td>44</td>
<td>39</td>
</tr>
<tr>
<td>Gets Along with Therapists</td>
<td>14</td>
<td>49</td>
<td>31</td>
</tr>
<tr>
<td>Plays Well with Others</td>
<td>12</td>
<td>36</td>
<td>41</td>
</tr>
<tr>
<td>Plays and Works Well Alone</td>
<td>14</td>
<td>41</td>
<td>39</td>
</tr>
<tr>
<td>Participates well in sports, hobbies, clubs</td>
<td>20</td>
<td>40</td>
<td>30</td>
</tr>
</tbody>
</table>

Subscale Total                                               | 41.42          |
Average Rating for Subscale                                  | 3.77           |

\(^a\)SA = Strongly Agree, A = Agree, U/NC = Uncertain / No Change, D = Disagree, SD = Strongly Disagree.

\(^b\)One sample \( t \)-test for mean >3.5. Positive \( t \) values for means => 3.5 and negative \( t \) values for means < 3.5.

\( * p < .05. \quad ** p < .01. \quad *** p < .001. \)
**Overall Effectiveness Rating**

Parents rate their perception of the overall effectiveness of therapeutic riding by assigning a number between 0 and 100, where 0 = no effectiveness at all and 100 = (equals) the highest possible effectiveness. This is a single-item measure of effectiveness. The average rating is 85.22% (median rating of 90%). All respondents show ratings of 50% effectiveness or higher, and more than 50% show a rating in the 90-100% range. These findings support the effectiveness of therapeutic riding from the parent perspective.

**Table 20**

*Overall Parent Rating of Effectiveness of Therapeutic Riding Between 0 - 100*

<table>
<thead>
<tr>
<th>Overall Rating</th>
<th>Number</th>
<th>Percentage</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100</td>
<td>34</td>
<td>53.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80-89</td>
<td>12</td>
<td>18.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70-79</td>
<td>9</td>
<td>14.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-69</td>
<td>1</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 -59</td>
<td>6</td>
<td>9.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 50</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No response</td>
<td>2</td>
<td>3.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td><strong>85.22</strong></td>
<td><strong>90</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Parent Comments in Response to Three Opened-Ended Questions**

Part 3 of the Horseback Riding Survey requests parents to respond to three open ended questions. The following are their comments that are content organized.

1. **What you like best about Therapeutic Horseback Riding?**

   *Self-Care/Independence.* Fosters self sufficiency and independence.
**Physical-Motor.** Walking and balance have improved. Overall physical ability. Loosens the muscles. The freedom and exercise. Keeps posture the way it should be. . . Without riding, I fear it may curve again. They force you to keep a straight back so it comes as second nature. You use muscles you do not even know you are working until you get off. Gaining new skills and strengths. Child is more lively, energetic. Riding is improving.

**Psychological/Emotional.** Child Likes it. My daughter has found something she likes. Helps self esteem and he does not even realize it. Large level booster. Learns patience. Keeps him content and busy many hours during the day. Courage. . . My son has fallen off twice(never was hurt) still loves it and still got back on to ride. Falling off did not bother her. Not afraid of a large animal. Pride again, even few normal children get to do this. Boosts confidence and gives pride. My son has a lot of fun and he is very proud of his riding. . . "It is his thing." Calming effect of atmosphere.

**Cognitive/School Learning.** Riding tends to make a person use himself 100% so it deepens concentration. Might learn an occupation from it. Active participation, learn how to follow directions. The extra training by helping with barn chores. Teaches new behavior and responsibility other than barn chores. The chance to travel and compete with Special Olympics. Takes it to another level. A good learning opportunity without the use of books.

**Social Interaction/Communication.** Tries to overcome aphasia only on the horse, "Whoa and walk on." Gives them a chance to be around other animals that he likes. Likes animals. Son loves horses. Social aspects. Daughter is beginning to interact better with people. Seems to get enjoyment out of it. Extracurricular fun and activities.
We like all the interaction with people, from instructor to volunteers and students. Impact on emotional and social behavior. **People.** Teacher (5). Teacher is great with kids - a knowledgeable horseman and understands disabilities. Therapist is good. Not as much emphasis on teacher, because she has a different role. Volunteers. Around good people. Comradery. Form relationships with other parents and plan things to do with their kids. People here understand each other, and we make new friends. Nice to go out on weekends and see everyone. **Environment and Horses.** Horses are well trained. Peaceful and tranquil environment. The great outdoors is a different and pleasing type of therapy. The change of scenery is an opportunity to be outdoors. I enjoy watching them ride and progress. It is close to home and free. I have heard good things, but it is too soon to tell. Everything.

2. **What you like least about Therapeutic Horseback Riding?**

**Program.** Not enough **time on horse.** More time on horses. Not enough horses. Classes are not long enough. Receiving more therapy while on the horse. More independence and consistency, organization, and advancement. Higher skill levels need to be developed. More challenging riding. More charting of progress. More time to do other stable jobs. **Scheduling** does not flow smoothly. Much time is wasted while on the horse because the instructor or therapist must go one on one, so it leaves other students hanging. Maximize riding time, late starts, no perceptual mounting order. With lack of work force, it is difficult to schedule classes in a manner that is skill level related. . . You just have to come when they tell you if you can. The **waiting time** to ride. Too much time to play around while waiting for lesson. Kids can get in trouble wondering around all those big horses. The fact it is only offered on Saturdays. We do not want to miss,
but so many other things take place on Saturday. Destroys the day. Lessons are too early on Sat. The wait list. I waited 2 years before I even got a chance.

**Financing.** Those who go for free are very happy with the program. More insurance coverage for occupational therapy. Too expensive, too far to drive. Costs of horses are very high. It is difficult to have enough horses to go around since they are so special. Need more riding that is less expensive. It is too expensive to make it a family affair. An expensive therapy but well worth it.

**The People.** Volunteers, not always enough. Volunteers not always trained in what they are doing. Continuity is interrupted from lack of volunteers or help. Volunteers need more training on how to interact with riders. Sometimes there is a language barrier. Need more qualified people. Lack of therapists.

**Environment.** The bees, the flies. The dirt. Not a good place to wait and watch kids ride. It is either too sunny or buggy. Right now he [child] is not focused on the riding, he is more concerned about his siblings. Weather can be a problem. Heat, rain, wind. Should have protected or indoor area. It is very far away from home, but is the closest center around. It can be dangerous, falling off or being kicked.

3. **What would you like to see improved about the Therapeutic Horseback Riding Program?**

Improvements that parents suggest generally are recommendations in response what the parents like least about their therapeutic riding centers.

**Program.** More barn chores to go along with riding. More goals defined and better placement and curriculum so kids are riding in their own level with children of similar capabilities -- This would be more productive. Lessons: More challenging,
higher skill level, longer (by the time each rider is mounted and session is ready to begin), part of the class time has already lapsed. More therapeutic, more stringent therapy. Appropriate class groups. Possibly more hours per week. All of these require funding to attain.

**Financing and Policy.** The cost to come from more resources, more insurance benefits. Institute regular programs through school so it is a part of the program. More federal aid and funding. Assistance to give program the structure and support it really needs. More centers, more programs, more intervention. More centers, closer, expansion of program. Better public awareness of benefits. Its programs are almost totally dependent upon other people, their donations, their horses, their free time. Parents do not want to lose this. Without it, program would not be available to me. It needs to be more grounded, have more stability. It could be gone tomorrow, if something were to happen with any phase of the operation

**People.** More staff with training. More teachers and therapists.

**Environment.** Protected arena.

**Summary of Parent Perceptions of the Effectiveness of Therapeutic Horseback Riding (Research Question 2)**

Significant quantitative findings in this study support beliefs that therapeutic horseback riding is effective in promoting physical-motor, psychological/emotional, and social well being in disabled children. It is also appropriate to use an integrated biopsychosocial approach in understanding functioning and disability. There is less evidence aside from improvement in attention span of effectiveness in cognitive/school learning development. The findings support the effectiveness of animal-child interaction
through therapeutic horseback riding and psychomotricity, which aims to promote mind and body integration through movement. Parent perceived effectiveness of therapeutic riding is established.

Qualitative comments by parents support the beneficial effects of therapeutic riding in behavioral improvement consistent with the five behavioral subscales in this study. Most parent comments support psychological-emotional behavioral improvement, followed by the social communication-interaction behavioral areas. The fewest parent comments are in the self-care/independence area.

The major areas parents suggest need improvement (via what they liked least and recommendations for improvement) are increase funding, provide more riding time, improve program organization and scheduling, increase resources (more trained professionals, teachers, and therapists), and better communicate the beneficial effects to the public, to promote more funding and awareness.

Research Question 3

3. What are the relationships among demographic, disability, and therapeutic horseback riding factors and parent perceived effectiveness of therapeutic horseback riding in children with disabilities?

Comparisons of Effectiveness According to Demographic Variables

Independent $t$-tests and Chi-Squared tests examine differences among the variables under study. There are no significant differences in gender, disability (physical disability, mental retardation and autism), horseback riding information or effectiveness according to ethnicity/race (Hispanic versus white/Caucasian). Independent $t$-tests examine differences in horseback riding information and improvement in behavioral
effectiveness according to gender. Significant independent t-tests reveal that female children score significantly higher than males in the percentage of horseback riding financing sources from community organizations. Compared with males, female children show better improvement in mobility (Physical-Motor subscale), being less lonely, and satisfaction (Psychological-Emotional subscale). Finally, parents of female children report higher overall ratings of the effectiveness of the therapeutic riding program compared with parents of male children. (These results are presented in Table 21).

Table 21
Comparisons of Horseback Riding Information and Effectiveness by Gender: Significant Independent t-test Results ($p<.05$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Female</th>
<th>Male</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean N</td>
<td>Mean N</td>
<td></td>
</tr>
<tr>
<td>Horseback Riding Factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financed By a Community Organization.</td>
<td>44.44% 24</td>
<td>12.16% 37</td>
<td>3.19**</td>
</tr>
<tr>
<td>Effectiveness Subscales</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical-Motor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobility</td>
<td>4.30 27</td>
<td>3.92 36</td>
<td>2.36*</td>
</tr>
<tr>
<td>Psychological/Emotional</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction</td>
<td>4.15 27</td>
<td>3.76 34</td>
<td>2.18*</td>
</tr>
<tr>
<td>Less Lonely</td>
<td>3.70 23</td>
<td>3.29 35</td>
<td>2.44*</td>
</tr>
<tr>
<td>Overall Effectiveness</td>
<td>89.77 26</td>
<td>81.93 36</td>
<td>2.39*</td>
</tr>
</tbody>
</table>

*p = <.05. **p <.01.
There are no significant differences in disability category according to age. Using a Pearson $r$ correlation, age is positively related to length of time in months and hours of participation in therapeutic horseback riding. Age is likewise significantly correlated with several measures of effectiveness including two of four Self-Care Independence behaviors, six of 12 Physical-Motor Behaviors, 16 of 31 Psychological-Emotional Behaviors; eight of nine Cognitive-School Learning behaviors, and two of 11 Social Interaction-Communication behaviors. These findings suggest the possible influence of age as a maturation factor, length of time in participation as a factor and/or the interaction of these factors on therapeutic riding effectiveness.

*Comparisons of Horseback Riding Information and Effectiveness According to Disability*

ANOVA using a three group comparison of disability types (physical disability, mental retardation and autism) examines differences in horseback riding background information and the number of disabilities. Post hoc tests include the Least Significant Difference (LSD) and the more rigorous Scheffe test. Significant findings with the LSD indicate that parents of children with physical disabilities report a significantly higher number of financing sources than those with mental retardation. Parents of both mental retardation and autistic children report a significantly higher number of total reasons for participation in therapeutic riding than parents of children with physical disabilities (significant using both Scheffe and LSD). Mentally retarded children have significantly more disabilities than the physically disabled (significant using both Scheffe and LSD tests). Furthermore, mentally retarded children have significantly more disabilities than autistic children (significant using only the LSD). These findings suggest children with
mental retardation have more disabilities than those with only physical impairments or autism, resulting in more reasons to participate in therapeutic riding (see Table 22).

Table 22  
**ANOVA and Post Hoc Comparisons of Significant Differences in Horseback Riding Information and Number of Disabilities According to Disability Category: Autism (N=27), Physical Disability (N=22), and Mental Retardation (N=15)**

<table>
<thead>
<tr>
<th>Variable and Group</th>
<th>Mean</th>
<th>F</th>
<th>p</th>
<th>Post Hoc Comparisons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>p Scheffe</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>p LSD</td>
</tr>
<tr>
<td>Number of Financing Sources</td>
<td>2.71</td>
<td>2.11</td>
<td>.07</td>
<td></td>
</tr>
<tr>
<td>Physical Disability (PD)</td>
<td>1.41</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autism (A)</td>
<td>1.30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Retardation (MR)</td>
<td>1.07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PD &gt; MR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Reasons for Participation</td>
<td>7.33</td>
<td>7.33</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Mental Retardation (MR)</td>
<td>4.07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autism (A)</td>
<td>3.67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Disability (PD)</td>
<td>2.55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MR &gt; PD</strong></td>
<td></td>
<td></td>
<td></td>
<td>.004</td>
</tr>
<tr>
<td><strong>A &gt; PD</strong></td>
<td></td>
<td></td>
<td></td>
<td>.015</td>
</tr>
<tr>
<td><strong>Total Disabilities</strong></td>
<td>3.91</td>
<td>3.91</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Mental Retardation (MR)</td>
<td>4.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autism (A)</td>
<td>3.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Disability (PD)</td>
<td>2.64</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MR &gt; PD</strong></td>
<td></td>
<td></td>
<td></td>
<td>.03</td>
</tr>
<tr>
<td><strong>MR &gt; A</strong></td>
<td></td>
<td></td>
<td></td>
<td>.036</td>
</tr>
</tbody>
</table>

*aNot Significant.
Using the three groups of disability types (physical disability, mental retardation and autism), ANOVA examines differences in effectiveness. Post hoc tests include the Least Significant Difference (LSD) and the more rigorous Scheffe test. A few behaviors with significant differences between the three types of disabilities appear in two of five subscales, Physical-Motor and Psychological-Emotional. There are no differences on items in the Self-Care/Independence, Cognitive-School Learning, or Social-Communication-Interaction subscales. Those with mental retardation have significantly greater improvement in range of motion and mobility on the Physical-Motor subscale than autistic children (significant using LSD only). There are no differences between mental retardation and physically disabled children in any behaviors. Physically impaired children benefit most in the psychological-emotional subscale, with one behavior – self image, scoring significantly higher than the children with autism (significant with both Scheffe and LSD). Compared with mentally retarded and physically disabled children, autistic children do not show a greater improvement in any behavior. These significant ANOVA and post-hoc results are shown in Table 23.
Table 23

ANOVA and Post Hoc Comparisons of Significant Differences in Effectiveness According to Disability Category: Autism (N=27), Physical Disability (N=22), and Mental Retardation (N=15)

<table>
<thead>
<tr>
<th>Effectiveness in Improved Behaviors</th>
<th>Mean</th>
<th>F</th>
<th>p</th>
<th>Post Hoc Comparisons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>p Scheffe  p LSD</td>
</tr>
<tr>
<td>Physical-Motor Behaviors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROM</td>
<td>2.76</td>
<td>.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Retardation (MR)</td>
<td>4.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Disability (PD)</td>
<td>4.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autism (A)</td>
<td>3.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MR&gt;A</td>
<td></td>
<td></td>
<td></td>
<td>ns*</td>
</tr>
<tr>
<td>Mobility</td>
<td>3.39</td>
<td>.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Retardation (MR)</td>
<td>4.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Disability (PD)</td>
<td>4.17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autism (A)</td>
<td>3.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MR&gt;A</td>
<td></td>
<td></td>
<td></td>
<td>.05      .02</td>
</tr>
<tr>
<td>Psychological Emotional Behaviors</td>
<td>3.17</td>
<td>.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Image</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Disability (PD)</td>
<td>4.37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Retardation (MR)</td>
<td>3.93</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autism (A)</td>
<td>3.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PD&gt;A</td>
<td></td>
<td></td>
<td></td>
<td>.05      .02</td>
</tr>
</tbody>
</table>

*Not Significant.

Independent t-tests compare the two-group categorization of disabilities using Umanksy’s and Hooper’s (1998) typology of biologic (physical impairment and mental retardation) and developmental (autism and emotional disturbance). There are no
significant differences on any horseback riding information variable. Except for the Physical-Motor subscale of behavioral effectiveness, there are no differences between these two groups of disabled children. Children with a physical disability or mental retardation show significantly greater improvement in range of motion, muscle strength and mobility than children in the autism-emotional disability group ($p = <.05$). These results are presented in Table 24.

Table 24

<table>
<thead>
<tr>
<th>Physical-Motor Behaviors</th>
<th>Physical Disability &amp; Mental Retardation</th>
<th>Autism and Emotional Disability</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range of Motion</td>
<td>4.22</td>
<td>3.85</td>
<td>2.329</td>
<td>.02</td>
</tr>
<tr>
<td>Muscle Strength</td>
<td>4.14</td>
<td>3.78</td>
<td>1.936</td>
<td>.05</td>
</tr>
<tr>
<td>Mobility</td>
<td>4.25</td>
<td>3.85</td>
<td>2.485</td>
<td>.02</td>
</tr>
</tbody>
</table>

Relationship Between Length and Hours of Participation and Parent Perceptions of Effectiveness of Therapeutic Horseback Riding

There is a significant inverse relationship between parent rating of overall effectiveness on a 0-100 scale and hours of participation each week in therapeutic riding ($r =-.253$, $p = .047$). Hours of horseback riding participation each week is also inversely related to getting along with brothers and sisters ($r =-.325$, $p =.01$) and positively associated with improvement in balance ($r =-.246$, $p =.05$). No other significant
relationships with behaviors on the effectiveness subscales and hours of participation are present.

The relationship between overall effectiveness and months in horseback riding participation is positive \( (r = .237, \ p = .06) \) although not significant. In addition, several behaviors on the effectiveness subscales are significantly related to the overall effectiveness rating (as discussed in Chapter 3, validity of survey tool).

There are several significant relationships between length of time in months in participation in therapeutic riding and behaviors on the effectiveness subscales. Table 25 presents the significant Pearson \( r \) Correlation Coefficients between behaviors on the effectiveness subscales and length of time (in months) in horseback riding participation. All significant relationships are positive.

On the four behaviors on the Self-Care/Independence subscale, there are two significant correlations for feeding and toileting and months in participation. On the Physical-Motor subscale, all but one of the 11 behaviors (range of motion) are significantly related with months in participation. Coordination has the strongest relationship \( (r = .43, \ p < .000) \). For the 31 behaviors on the Psychological-Emotional subscale, 11 behaviors are significantly related with months in participation. Less arguing has the strongest relationship \( (r = .407, \ p = .002) \). For the Cognitive Behavior/School Learning subscale, all but one of the nine behaviors (grades in school), are significantly related with months in participation. Concentration has the strongest relationship \( (r = .439, \ p = .001) \) with months in participation. For the Social Communication – Interaction Behavior subscale, four of the 11 behaviors are
significantly related with months in participation. Participates well in sports, hobbies, clubs, etc. has the strongest relationship ($r = .396, \ p .002$) with months in participation.

Table 25

*Pearson r Correlations of Significant Relationships between Effectiveness and Length of Time in Participation in Therapeutic Riding*

<table>
<thead>
<tr>
<th>Effectiveness Indicators on Subscales</th>
<th>Pearson $r$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-Care/ Independence Behaviors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeding Self</td>
<td>.252</td>
<td>.059</td>
</tr>
<tr>
<td>Toileting</td>
<td>.277</td>
<td>.039</td>
</tr>
<tr>
<td><strong>Physical-Motor Behaviors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muscle Strength</td>
<td>.332</td>
<td>.007</td>
</tr>
<tr>
<td>Mobility</td>
<td>.266</td>
<td>.035</td>
</tr>
<tr>
<td>Balance</td>
<td>.344</td>
<td>.006</td>
</tr>
<tr>
<td>Postural Control</td>
<td>.331</td>
<td>.008</td>
</tr>
<tr>
<td>Coordination</td>
<td>.430</td>
<td>.000</td>
</tr>
<tr>
<td>Muscle Tone</td>
<td>.373</td>
<td>.002</td>
</tr>
<tr>
<td>Ambulate – Walking</td>
<td>.287</td>
<td>.028</td>
</tr>
<tr>
<td>Manual Dexterity</td>
<td>.295</td>
<td>.025</td>
</tr>
<tr>
<td>Physical Ease</td>
<td>.272</td>
<td>.033</td>
</tr>
<tr>
<td>Energy Level</td>
<td>.255</td>
<td>.048</td>
</tr>
<tr>
<td>Fewer Body Complaints</td>
<td>.298</td>
<td>.020</td>
</tr>
<tr>
<td><strong>Psychological/ Emotional Behaviors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Withdrawn</td>
<td>.26</td>
<td>.046</td>
</tr>
<tr>
<td>Less Arguing</td>
<td>.407</td>
<td>.002</td>
</tr>
<tr>
<td>Fewer Mood Swings</td>
<td>.325</td>
<td>.014</td>
</tr>
</tbody>
</table>

Continued
Table 25

*Pearson r Correlations of Significant Relationships between Effectiveness and Length of Time in Participation in Therapeutic Riding*

<table>
<thead>
<tr>
<th>Effectiveness Indicators on Subscales</th>
<th>Pearson r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Psychological/ Emotional Behaviors (Continued)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complies with Reasonable Requests</td>
<td>.261</td>
<td>.046</td>
</tr>
<tr>
<td>Outgoing (less shy)</td>
<td>.248</td>
<td>.054</td>
</tr>
<tr>
<td>Cooperates (Less Stubborn)</td>
<td>.307</td>
<td>.018</td>
</tr>
<tr>
<td>Motivation</td>
<td>.336</td>
<td>.008</td>
</tr>
<tr>
<td>Self-Confidence</td>
<td>.316</td>
<td>.013</td>
</tr>
<tr>
<td>Self-Image</td>
<td>.281</td>
<td>.030</td>
</tr>
<tr>
<td>Positive Attitude</td>
<td>.266</td>
<td>.038</td>
</tr>
<tr>
<td>Taking Responsibility</td>
<td>.351</td>
<td>.006</td>
</tr>
<tr>
<td><strong>Cognitive Behaviors/ School Learning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory</td>
<td>.423</td>
<td>.001</td>
</tr>
<tr>
<td>Attention Skills/ Span</td>
<td>.356</td>
<td>.006</td>
</tr>
<tr>
<td>Concentration</td>
<td>.439</td>
<td>.001</td>
</tr>
<tr>
<td>Learning</td>
<td>.308</td>
<td>.018</td>
</tr>
<tr>
<td>Alertness</td>
<td>.331</td>
<td>.001</td>
</tr>
<tr>
<td>Decision-making</td>
<td>.377</td>
<td>.003</td>
</tr>
<tr>
<td>Self-Discipline</td>
<td>.438</td>
<td>.001</td>
</tr>
<tr>
<td>Self-Control</td>
<td>.340</td>
<td>.009</td>
</tr>
<tr>
<td><strong>Social Communication / Interaction Behaviors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receive Information (Receptive)</td>
<td>.276</td>
<td>.034</td>
</tr>
<tr>
<td>Expressing Self Appropriately</td>
<td>.304</td>
<td>.020</td>
</tr>
<tr>
<td>Plays and Works Well Alone</td>
<td>.334</td>
<td>.009</td>
</tr>
<tr>
<td>Participates well in sports, hobbies, clubs, etc.</td>
<td>.396</td>
<td>.002</td>
</tr>
</tbody>
</table>
Summary of the Relationships Among the Demographic, Disability, Horseback Riding Factors and Parent Perceptions of Effectiveness of Therapeutic Horseback Riding (Research Question 3)

Several relationships exist among the demographic, disability, therapeutic horseback riding factors and parent perceived effectiveness of therapeutic riding. Parents of female children with disabilities demonstrate higher overall effectiveness ratings, better improvement in mobility and satisfaction, and more improvement in being less lonely than males. Age is positively associated with improvement in several self-care, physical-motor, psychological-emotional, cognitive-school learning, and social-interaction/communication behaviors.

Mentally retarded children have more disabilities than autistic children, and therefore, identify more reasons to use therapeutic riding. Mentally retarded children also show significant improvement over autistic children in range of motion and mobility. Physically disabled children show more significant improvement in self-image than autistic children. There are no differences in behaviors between physically disabled and mentally retarded children.

The data analyses indicate that there is little if any relationship between the length of each riding lesson (in hours) and improvement if child behaviors. However, the length of time in months in participation is significantly associated with behavioral improvement across all subscales, and with most behaviors on the Physical-Motor and Cognitive Behavior/School Learning subscales. Chapter four presents the results of data analyses and Chapter 5 provides a discussion of the findings in terms of interpretations, implications and recommendations.
CHAPTER 5
DISCUSSION

Introduction

Disability as a major societal problem, affects 54 million people and 4.4 million children in the U.S. (CDC, 2000; Newacheck & Halfon as cited in Trinkl, 1998). Children with varying disabilities are of concern to special education faculty who need to address the special needs of children with disabilities. This study examines the effectiveness of human-animal interaction, specifically horseback riding, in children with varying disabilities. Horseback riding is an environmental intervention that aims to promote mind and body integration through movement (psychomotricity) and the human-animal bond (Delta Society, 2001a; Spink, 1993, All, et al., 1999). This study describes and explores the synergistic relationship between humans and animals, specifically therapeutic riding and psychomotricity on improvement in child behaviors in those with disabilities. Effectiveness is assessed from the parent’s perspective of improvement of child behaviors in five categories resulting from their participation in therapeutic horseback riding, independence-self care, physical-motor, psychological-emotional, cognitive-school, and social interaction. Behavioral improvements are indicators of effectiveness. Chapter 5 presents a discussion about the interpretations, limitations, implications, recommendations, and conclusions in this study about the effectiveness of therapeutic riding on children with varying disabilities.
Interpretations

Research Questions

Three research questions address the purposes of this study. These purposes are (1) to describe demographic, disability, and therapeutic horseback riding information about children participants with disabilities; (2) to assess the effectiveness of therapeutic riding from parent perspectives; and, (3) to explore relationships among demographic, disability, and therapeutic horseback riding factors and parent perceived effectiveness of therapeutic horseback riding in children with disabilities.

Research Question 1

Responses to Research Question 1 provide data on personal factors (demographic and disability) and environmental factors (therapeutic horseback riding) of children that participate in therapeutic riding. Of seven NARHA certified therapeutic horseback riding centers for the disabled in south Florida, six met the eligibility criteria of having children aged 4-19 participate in riding. An estimated 159 parents of children with varying disabilities met eligibility criteria and 64 parents constituted the final data-producing sample. This results in a participation rate of 40.25%. The majority of children with disabilities participating in therapeutic horseback riding are white males, ranging in age from 6 to 11, average age of 10.7 years, with predominant disabilities of: specific learning disorders, speech and language, orthopedic, developmental delay and autism disabilities. These disabilities and impairments are consistent with those identified in the Second Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act, Section II Student Characteristics, of children served under IDEA by disability category 1998-99 (2000b, p. 21). However, this study finds a higher
prevalence of mental retardation, orthopedic and autism because parents were asked to report all disabilities. There are 59% with physical and mental retardation disabilities and 41% with autism. There are 48 (75%) that checked more than one category indicative of co-occurring disabilities. This is inconsistent with U.S. prevalence rates of one-third of children having co-occurring disabilities. A suggestion is that the U.S. should assess all possible co-occurring disabilities in order to more fully understand the scope of disabilities in children.

Comorbidity (co-occurring disabilities) needs to be considered in empirical studies. Estimates of comorbidity are as high as 22.5% in the Annual Report by OSEP (2000b). "Estimates vary from study to study, in part because of differences in the populations covered and definitions of disability used. Some researchers estimate that 19 percent of special education students have co-occurring disabilities; others report figures as high as 48 percent" (Hogan et al., 1997; Wagner et al., 1991, as cited in the Annual Report by OSEP, 2000b, p. 33). This study's findings of 75% with co-occurring disabilities is greater than the highest figure of 48% report in the U.S. Annual OSEP Report (2000b). Findings indicate that children with all types of disabilities participate in therapeutic riding.

Word of mouth is the primary way parents learn about therapeutic riding, suggesting a need to more effectively communicate this important therapy. The most prevalent reasons for participating in the riding programs are physical and recreational purposes; however, a number of parents report multiple reasons consistent with goals of NARHA riding organizations. Riding is reported to be 65% financed as free or a community organization. The median length of riding experience is 24 months, with one
hour per week as the average length of the riding lesson. Parents overwhelmingly report children are “very interested” in participating in the horseback riding programs.

This study provides a foundation of descriptive and exploratory knowledge to address Aisenbrey’s (2000) call for development of a knowledge base. In her article, “Gap in Literature: But Does it Really Work?” Aisenbrey strongly recommends that professionals share results and develop a collective knowledge base about hippotherapy (HPOT). Professionals using HPOT need to be aware not only of atypical clients and new therapies, but customary approaches to common problems. “No profession can generate a scientific basis without a common body of evidence to present to the medical doctors to the insurance companies and to our clients to demonstrate in an objective manner that HPOT works” (p. 1).
Research Question 2

Research question 2 aims to describe whether therapeutic horseback riding is effective. This is determined by parent perceptions of effectiveness of therapeutic horseback riding in children with varying disabilities using the Part 2 of the Horseback Riding Survey – Parent Ratings of Behavioral Effectiveness. Parent ratings provide a measure of perceived effectiveness of therapeutic horseback riding in five behavioral categories, with 67 behaviors.

All 67 behavioral ratings demonstrate a significant difference from a score of “3” (no change), using one-sample t-tests. Using one-sample t-tests compared with a mean score of “3.5” identifies 27 of the 67 behaviors that improve the most \((p = <.05)\). Significant quantitative findings in this study support beliefs that therapeutic horseback riding is most effective in promoting physical-motor, psychological/emotional, and social well being in disabled children, and it is appropriate to use an integrated biopsychosocial approach in understanding functioning and disability.

Individual behavioral ratings higher than a 4.0 appear in two subscales indicating the greatest areas of behavioral improvement: range of motion, mobility, balance, posture (physical-motor subscale and self-esteem, self-confidence and self-image (psychological-emotional subscale). Findings support the basic construct of environmental factors as facilitating or hindering impact of features of the physical, social and attitudinal world" (WHO, 2001a, p. 8). The supports Facklam’s proposition that “Each person will adapt or adjust to disability in their way at their own time. Adjustment is seen by many as the function of the congruence between the subjective
world of the person and the external environment. If the two fit well, the adjustment should be quicker and better" (p. 1).

Although there is less evidence aside from improvement in attention span of effectiveness in cognitive/school learning development, generally results support the use of therapeutic horseback riding (use of the horse and equine-oriented activities) to achieve a variety of therapeutic goals, including cognitive, physical, emotional, social, educational and behavioral goals (NARHA, 2000a, 2000b, 2000c, 2000d, 2000e).

The findings support the effectiveness of animal-child interaction in promoting mind and body integration through movement (psychomotricity) and the human-animal bond (Delta Society, 2001a; Spink, 1993; All et al., 1999). “Psychomotricity concerns the progressive development of both the mind and body and their interaction under the influence of organic maturation and social stimuli” (Spink, 1993, p. 9). The mind and body integration and movement experience and education can be applied to the field of therapeutic riding (Spink, 1993). Findings support Barwick (1986) a French therapist who claims psychomotricity reunites a person with self, promotes self-awareness and coexistence with one's environment. It aims at building an individual who becomes able to reflect mental and physical ease and harmony.

Findings support the therapeutic effects of hippotherapy reported by Heine and Benjamin (2000), of the American Hippotherapy Association. They report that movement of the horse is the tool that therapists use to improve patients' neuromotor function. Findings support the goals of hippotherapy that are to achieve positive effects from the movement of the horse, noted in motor coordination, muscle tone, postural alignment, and strength. Findings support the effects of changes in cognitive, sensory
processing, balance, affective, arousal and speech/language production functions, improvements in trunk alignment and motor coordination. System changes are often a direct result of the horse's movement. Changes in speech production can often occur.

Findings in this study about the effectiveness of therapeutic riding support those who describe the facilitative effects of AAA/AAT, the human-animal bond and human-animal interaction. These include Delta Society’s efforts to improve human health through service and therapy animals (Delta Society, 2001c, p. 1). Study findings respond to Jorgenson (1997) who requests that the synergistic phenomena between humans and animals be given serious consideration. It responds to All et al. (1999) who identify the need to develop tools "to assess and quantify meaningful improvements in functional outcomes . . . to accurately assess the improvements that qualitative research has reported with horseback riding" (p. 55). Studies and instruments measuring change need development especially studies with larger sample sizes. The synergistic phenomena between humans and animals need to be addressed. Future research should also explore how animals can alter perceptions to people in their environment. "Longitudinal studies that specifically address the psychosocial benefits received from pet-assisted therapy and horseback riding are crucial" (p. 55).

Study results support the therapeutic effect of Animal Assisted Therapy (AAT) as a goal directed intervention in which an animal is an integral part of the treatment process. AAT aims to enhance improvement in physical, psychological and/or cognitive functioning. It posits that communicative, psychosocial, and academic functioning of children and adolescents with a variety of disabilities can be improved by participating in AAT (Polshuck, 1997). Study results support NARHA (2000a) and its assertions that
AAA can produce a calming effect on students that can help them focus on learning stimuli. It helps to motivate, encourage learning, cooperation, and expression. Animals may become a stimulus for exercise, reduce anxiety, and provide an external focus of attention. Animals are also a source of comfort and may decrease loneliness and depression while promoting a more interesting environment (NARHA, 2000a).

Findings support Poleshuck's (1997) discussion of AAT where animals are used as a treatment modality with children and adolescents. Meaningful activities, such as with animals, are helpful in establishing motivation. The benefits of animal assisted therapy are on the communicative, and psychosocial effects of children and adolescents with a variety of disabilities. AAT improves range of motion, muscle strength, mobility, memory skills, attention skills, social skills, self-care skills, and self-esteem (Poleshuck, 1997).

Findings support the 1983 paper by Beiber who reports that animals can be influential in encouraging children to speak or improve their expressive skills, since communication is essential for psychosocial well-being and success in the world (cited in Poleshuck, 1997). Results provide evidence that while upon a horse, a child's attitude, signing, taking, touching, feeling, bonding, self-discipline, independence, attitude, understanding instructions, and adjustment occur when on horses and may carry over to everyday life (All et al., 1999). AAT promotes improvement in the physical, psychological and/or cognitive functioning (All et al., 1999). Pets may provide "an external focus of attention" (Jennings, 1997, p. 358) and can produce a calming effect on students that can help them focus on learning stimuli. Findings support Arkow (1984), who indicates that animals can improve sociability, bring animation to those who have
been withdrawn, enhance morale, provide sensory stimulation (Arkow, 1984) and 
Triebenbacher (1998), who say that the child's attachment to an animal is positively 
related to the child's sense of self-esteem (Triebenbacher, 1998).

"Animals succeed in reaching children with emotional, mental and physical 
disabilities where humans can not reach" (Kaufman, 1998). Prisons have been using 
animal programs for successful rehabilitation (Edney, 1995). According to Edney 
(1995), the animal-person interaction fosters the formation of bonds and learning about 
responsibility and love.

Kaufmann (1997) reports that much of the literature on the therapeutic 
effectiveness of animal contact is based on anecdotal evidence, and it is necessary to 
continue to clarify and measure this health producing relationship (Kaufmann, 1997). 
Research does lend credibility to the therapeutic use of animals in health care (Jorgenson, 
1997). The synergistic phenomena between humans and animals should be given serious 
consideration. For years, history shows animals have played a significant role in the 
lifestyles of humans. The human-animal bond (HAB) is historically important to human 
survival. Findings in this study provide evidence of the benefits of horseback riding, as 
hippotherapy and an AAT. These benefits are established through parent ratings of 
effectiveness of therapeutic riding. The major areas parents suggest need improvement 
(via what they like least and recommendations for improvement) are increased funding, 
increase riding time, improved program organization, scheduling, increased use of 
professionals, resources, and better communication of the beneficial effects to the public, 
to promote more funding and awareness.
Research Question 3

Research Question 3 explores the relationships among demographic, disability, and therapeutic horseback riding factors and parent perceived effectiveness of therapeutic horseback riding in children with disabilities. The literature does not report studies about relationships among demographic, disability, horseback riding factors and the effectiveness of therapeutic riding in children with disabilities. However, the environmental-biopsychosocial model to explore relationships among variables in this study is supported by the findings of significant relationships among the variables. Specifically, results support Bronfenbrenner's (1977, 1986, 1989) ecological-contextual model frequently applied in education. People develop in a variety of contexts (environments) and the constant interaction play an important role in development. The integration of contextual-biopsychosocial models also proposed by Kollins et al., (2001), World Health Organization (WHO, 2001a) and the holistic developmental model are also supported. "From a holistic developmental perspective, the individual functions as an integrated organism, and development arises from the dynamic interrelations among internal and external factors (e.g., behavioral, biophysical, cognitive, contextual, social interactional)" (Farmer, et al., 2001, p. 1). "Such factors influence each other bidirectionally and form an interconnected system of correlated constraints" (Farmer et al., 2001, p. 1). Findings support Kavale (2001) who emphasizes the critical importance of an integrative model particularly in special education decisions related to functional behavioral analyses and positive behavioral intervention.

**Demographic.** Study findings indicate no significant differences in gender, disability (physical disability, mental retardation and autism), horseback riding
information or effectiveness according to ethnicity/race (Hispanic versus white/Caucasian). Several relationships exist among other demographic, disability, therapeutic horseback riding factors and parent perceived effectiveness of therapeutic riding. Parents of female children with disabilities demonstrate higher overall effectiveness ratings, better improvement in mobility and satisfaction, and more improvement in being less lonely than males.

Age is positively associated with improvement in several self-care, physical-motor, psychological-emotional, cognitive-school learning and social-interaction/communication behaviors. There are no significant differences in age according to type disability category.

**Disability.** Mentally retarded children have more disabilities than autistic children, and therefore, identify more reasons to use therapeutic riding. There are a few behaviors in two of the five subscales, where significant differences between the three types of disabilities appear: Physical-Motor and Psychological-Emotional. Mentally retarded children show significant improvement compared with autistic children in range of motion and mobility. Physically disabled children show more significant improvement in self-image than autistic children. There are no differences between disability groups on items in the Self-Care/Independence, Cognitive-School Learning, or Social-Communication-Interaction subscales. The few differences found support the need to monitor co-occurring disabilities carefully. Light and DeFries (1995) indicate that a study of children with one disability may confound study findings when a second disability such as ADD is ignored.
Length in months and hours of participation. There are no positive relationships with behaviors on the effectiveness subscales and hours of participation. The relationship between overall effectiveness and months in horseback riding participation is positive ($r = .237, p = .06$) although not significant.

Several significant relationships are present between length of time in months of participation in therapeutic riding and behaviors on the effectiveness subscales. The four behaviors on the Self-Care/Independence subscale show two significant correlations for feeding and toileting and months in participation. On the Physical-Motor subscale, all but one of the 11 behaviors (range of motion) is significantly related with months in participation and coordination has the strongest relationship. For the 31 behaviors on the Psychological-Emotional subscale, 11 behaviors are significantly related with months in participation with less arguing as the strongest relationship. For the Cognitive Behavior/School Learning subscale, all but one of the nine behaviors (grades in school) is significantly related with months in participation, and concentration has the strongest relationship with months in participation. For the Social Communication – Interaction Behavior subscale, four of the 11 behaviors are significantly related with months in participation, (participates well in sports, hobbies, clubs, etc.) has the strongest relationship with months in participation. These findings support All et al. (1999) who indicate that the amount of time in a therapeutic riding program does make a difference, and studies should really be longitudinally based. Results provide support to Aisenbrey (2000) who states that “we don’t know if there is an optimum frequency and duration of treatment for the various types of clients we see” (p. 1). Findings between length of time in participation and the positive association with age, supports the idea of “early
intervention” and the mission of the Early Education Program for Children with Disabilities (Umanski & Hooper, 1998, p. 3). The association of age and effectiveness supports DelGiudice and Berg (n.d.) who indicate that age plays a major role in maturation and psychological development. Study findings support the possible influence of age as a maturation factor, months in participation as a factor and/or the interaction of these factors on therapeutic riding effectiveness.

**Strengths of the Study**

A strength of this study is in its justification. In addition to contributing to the body of knowledge for special education faculty and programs, this study contributes in part to the mission of the professional associations. Included are associations that aim to develop a body of knowledge in animal-human bonding, animal-human interactions, animal assisted activities, animal assisted therapy, and therapeutic horseback riding such as the Delta Society, NARHA, and American Hippotherapy Association. Fostering and supporting research and the development of knowledge and innovations to improve results for children with disabilities is the most significant justification.

A second strength is the significance of the study in addressing legal, ethical, and educational mandates pertaining to those with special needs and varying disabilities. Special education faculty continuously seek new ways to address the needs of children with disability problems, to enhance their adjustment, and maximize their potential. Contributing to the body of knowledge about therapeutic riding may promote funding. If it is recognized as being a significant therapy, then there is better chance of more funding and involvement of academically prepared professionals in riding programs. Currently
these therapeutic riding programs rely almost totally on volunteers, so it would be better profiled if programs involve more professionals that base practice on scientific theory.

A third strength is the study's theoretical context. As a global concern, this study examines functioning and disability within the newly developed *International Classification of Functioning, Disability and Health* (ICF). Various perspectives of functioning are integrated through a “biopsychosocial” approach (WHO, 2001a, p. 20). A person's functioning and disability is conceived as a dynamic interaction between health conditions (diseases, disorders, injuries, traumas, etc.) and contextual factors (environmental and personal factors) (p. 8).

This theoretical context of the study also supports Thompson (1996) who reports that while several models are applied, universal agreement of a specific model for the disabled and vocational development has not been accomplished. Research primarily focuses on well-known vocational development theories (psychodynamic and longitudinal) that have been tested in research for non-disabled people, then generalized to the disabled models (Goldberg, 1992). This study responds to Thompson by using a model for the disabled that emphasizes more than psychodynamics – it emphasizes the biological and social dimensions as well as the interaction with the environment.

A fourth strength of the study is development of a measure of behavioral effectiveness applicable to children with varying disabilities who participate in therapeutic riding. The measure of effectiveness is consistent with U.S. educational standards and public laws and facilitates compliance with the many legal mandates for children with special needs. In describing the development of the Individual Education Plan (IEP), Umansky and Hooper (1998) report that "Efforts to include family members
in the assessment process are ever-increasing ...parents need to view the assessment and intervention as consistent with their perceptions of their child" (p. 367). Parents are usually most knowledgeable about their child's behavior across time and situations. Therefore, they may be the best sources of data about children competencies (Achenbach, 1991, p. 3). This study supports the directives from Umansky and Hooper (1998) and (Achenbach, 1991).

A fifth strength of the study is the number of participants compared to other studies. The literature reports little scientific rigor, small sample sizes, and lack of homogeneous populations in studies about therapeutic horseback riding.

The sixth and last strength is that the study has well formulated research questions that evolve from a comprehensive review of the literature, and the several gaps in the literature. Disability, and specifically children with disabilities are a global concern. As a form of human-animal interaction and animal assisted therapy, horseback riding has been in existence for many years and is used for children with varying disabilities to enhance physical, mental, and social/emotional adjustment. However, the body of scientific knowledge is scant. There is little research literature that describes demographic and disability characteristics of children that participate in horseback riding, measurable indicators of the effectiveness of horseback riding, and relationships of demographic, disability and participation factors with effectiveness.

**Limitations**

1. Although the present study appears to be one of the more comprehensive and sound studies, it has limitations primarily in the research design. The sampling method is non-probability, the design is non-experimental, and the research
instrument is a newly designed tool. Generalizing study results must be with caution.

2. There are no parents of Black children represented in the sample.
3. There is no representation of Spanish-only speaking parents.
4. Many parents of children with emotional-psychological disabilities other than autism may be underrepresented. This is due to lower parent participation and presence during therapeutic riding activities of children with these disabilities.
5. Another weakness is the reliance on the parent’s memory to recall child behaviors when they first began therapeutic riding, and changes that may have occurred as a result of riding today.
6. While the relationships among study variables are explored (demographic, disability, horseback riding factors, and measures of effectiveness in improved behaviors), there is no control over extraneous variables. Many variables could have intervened to affect the study findings including other therapies that children are receiving.

**Practical Implications**

1. The literature as well as findings in this study lends support that therapeutic horseback riding may be an effective intervention in children with disabilities. Children with co-occurring disabilities as well as those with either a physical, mental or psychosocial-emotional disability are well suited to participate in this therapy. There do not appear to be any kind of environmental impediments to limit participation in therapeutic riding. Because of broad based applicability to multiple types of disabilities and a broad range of beneficial effects, therapeutic riding should be seriously considered in planning care for disabled children. The therapy is one of the few that may be continued across the life span.

2. The program should have more funding and be incorporated into IEP plans and other therapeutic plan as an alternative therapy for children with one or many disabilities. The school system is a primary place to promote such therapy.

3. Increasing knowledge of therapeutic riding in schools may be a catalyst to identify funds that could be applied to children with disabilities. Increased
utilization of this type of therapy may also be a stimulus to generate further funding at the State and national levels. Increasing funding sources could further improve this therapy.

4. A clear typology of riding programs needs to be developed. There are different types of riding therapy programs; different skills levels in riding and perhaps those more closely aligned with the hippotherapy programs should become a model. Hippotherapy programs require licensed practitioners. Defining therapy goals, designing individuals plans for children, and reporting progress and beneficial outcomes will strengthen the validity of these programs. Furthermore, only when these programs become infiltrated with a sufficient number of professionals can these activities be accomplished. Again, this is tied to funding. Small incremental steps in formalizing therapeutic riding for children with disabilities can occur and should begin.

5. The recommendations of Heine and Benjamin (2000) should be considered. There are guidelines as to the qualifications, responsibilities, and training requirements of therapists wishing to practice hippotherapy. These have been established by the American Hippotherapy Association and approved by NARHA. Therapists providing direct treatment in a hippotherapy program should meet the following qualifications: licensed or registered to practice physical therapy, occupational therapy or speech-language pathology. They should have training in hippotherapy, equine movement, and equine psychology, be a NARHA-registered instructor or have such an instructor assisting with the horse at all sessions (Heine and Benjamin, 2000).

6. The program needs to be appropriately marketed to the right people, at the right time including as an early intervention, and the price should be affordable to families with disabled children. The program needs to market to recruit more volunteers in the community. This might temporarily alleviate some of the scheduling, waiting and organizational and management issues that parents describe.

7. Since so many parents hear about the program by word of mouth, there should be more publicity as to its use with those who have disabilities.
8. More funding is needed to support this program.

9. An unexpected finding is the impact on parents. The opportunity for parents to participate in a “learning environment” and observe improvement is beneficial. Participation in riding provides social interaction and support groups for the family. This involvement may decrease isolation and can change the way the families perceive themselves as parents and as the brothers and sisters of a disabled child. Therapeutic riding provides opportunity for family participation in other events associated with riding such as outings, Special Olympics, fundraising, marketing and political activity. It can become a holistic experience for the entire family.

10. Parents may be good resources in providing recommendations for improvement in therapeutic riding programs.

11. The role of the parent in motivating children to participate should be emphasized.

12. Health and human service professionals in the field of rehabilitation with the disabled need to collaborate and lead the movement in human-animal therapy, particularly hippotherapy and provide sound theoretical, empirical and practical solutions to addressing the needs of children with disabilities. These professionals include special education teachers and counselors, occupational, speech, physical, psychiatric and family therapists, the medical community, social workers, long-term care insurance providers, rehabilitation organizational leaders and policy makers.

13. Because literature about the effectiveness of horseback riding as a therapeutic intervention remains unclear, Doerkson and Bartlett (2002) of the Research Alliance for Children with Special Needs in Ontario, Canada, are currently in process of conducting a meta-analysis of the available research literature. Their study aims to provide therapists with indicators of the effectiveness of this type of intervention on variables reflecting impairment, activity, and participation. This researcher will provide descriptive and exploratory findings from this study for their meta-analysis.

14. The important role that ancillary services play in the education of children needs to be revisited. With PL 94-142 and its amendments, ancillary services do play an
important role in the education of a child. PL 94-457 actually extended the rights and privileges of special needs children. It also requires that parents and teachers confer to design appropriate program for the disabled child. Other school staff members, such as counselor, social workers and therapists can communicate and guide parents on their child’s behalf (Seligman, 2000). PL 99-457 hands the ultimate responsibility for planning, implementing and involving services of others to the teacher. The intervention approach comes from a central theoretical scheme which is constantly repeated in the literature that collaboration between school, community and public recognition is necessary for optimal progress (Seligman, 2000).

15. Universities should consider affiliating with therapeutic riding facilities, participate in their strategic planning, conduct research and develop grant applications. The Office of Special Education Programs (OSEP) which administers the IDEA is dedicated to improving results for infants, toddlers, children and youth with disabilities ages birth through 21 by providing leadership and financial support to assist states and local districts. IDEA authorizes formula grants to states, and discretionary grants to institutions of higher education and other non-profit organizations to support research, demonstrations, technical assistance and dissemination, technology and personnel development and parent-training and information centers (OSEP, 2001).

16. It is suggested that Universities include AAT and hippotherapy as part of rehabilitation and special education curriculum.

**Recommendations**

**Instrumentation**

1. Add a disability category which places the child in a primary group: physical disability, mental retardation, and autism/emotional disability so that outcomes unique to the disability can be accounted for in research studies.

2. Add additional items to the first subscale, Self-Care/Independence.

3. Develop another version of the survey to report “current behaviors”. The same agreement/disagree scale may be used, with the exception that the no change
response is removed. Parents may be asked, "to what degree are the following behaviors present in your child."


5. Conduct a similar study, and establish concurrent validity using another reliable and valid survey tool of child behaviors. The parent may complete two different surveys, or another individual (such as the instructor) could complete one survey and the parent could complete the Horseback Riding Survey.

6. Develop a Spanish version of the survey tool

7. Perform a factor analysis of the 67 behaviors

8. Perform a secondary analysis of data using an explanatory model (multiple regression) to determine which variables provide the greatest explanation of variation in improvement of child behaviors.

9. Perform a secondary analysis of data using "age" as a covariate (to remove effects of maturation).
Research Designs and Future Studies

1. Future studies should select a larger sample to allow multiple comparisons according to the 13 categories of disabilities.

2. Where possible, probability sampling should be used to strengthen generalizability of study findings to a broader population (population validity).

3. Efforts should be made to assure a broader representation of racial/ethnic groups and children with emotional-psychological disabilities other than autism.

4. The setting should be a larger geographic area to strengthen generalizability of study findings to broader geographic areas (ecological validity).

5. Future studies should attempt to account for other extraneous variables including participation in other types of therapies, situational stressors at home, school or in the child’s personal life, which may have affect the results of this study.

6. Since disability is a long-term problem, and since children participants in therapeutic riding do appear to stay in the program long-term, a longitudinal study should be designed.

7. While there are only a few findings to indicate gender differences, study findings suggest there may be gender differences with respect to the effects of therapeutic riding on mobility, loneliness, and life satisfaction. Females demonstrate significantly greater improvements in these behaviors. It is suggested that gender differences be explored.

8. Conduct a quasi-experimental pre/post test design to compare changes in behaviors resulting from therapeutic riding.

9. Conduct a comparative study of two groups: therapeutic riding participants versus children on a waiting list to begin participation in therapeutic riding.

10. The length of time in months seems to be an influencing variable on improvement in behaviors; however, the length of time of the riding lesson did not appear to influence behaviors. A factorial design could be relatively easily drawn to examine the effects of length of time of each riding lesson and frequency of participation in riding each week on the dependent variable of improvement in
behaviors. It appears that a study could be designed with two independent variables (2 x 3 Factorial):

Frequency of participation (one versus two times a week) and
Length of riding lesson (example 30 minutes, 45 minute and 60 minutes)

The major difficulty would be in any group differences. However, the pre-test could be used as a covariate to control for existing differences between each group.

10. Comorbidity (co-occurring disabilities) needs to be considered in all empirical studies and data developed and monitored by U.S. government reporting agencies.

Conclusions

1. An environmental- biopsychosocial approach to study and understand disabilities is an appropriate model.
2. The animal-human interaction, AAT, and horseback riding may be therapeutically effective in improving behaviors in children with varying disabilities.
3. Horseback riding for children with disabilities is important to the family.
4. Improvement in child behaviors may be positively related to the length of time (in months) of participation in riding and age.
5. The horse is a non-judgmental therapist.
6. Horseback riding for the disabled is liked by therapists, families and children who participate.
7. Horseback riding for children with disabilities may be a racially biased therapy.
8. More research is needed to support the findings in this study.

In conclusion, findings help to explain the quote of Neil Cutler, a disabled rider (Fischbach, 1999):

"When on a horse, your strengths are combined, and your weaknesses diminished."
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188

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APPENDIX A

Horseback Riding Survey
HORSEBACK RIDING SURVEY

Directions: Please respond to every question, following the specific directions for that section or question.

1. What is your child's: Age _________ Sex _________ Race _________

2. Reason for Participation: Using the list below, please check □ the reason(s) your child participates in horseback riding: (Check all those that apply)

   Physical □ Social □ Emotional □ Occupational □ Behavior Modification □ Recreational □

3. If there is another reason not listed above, please write reason:__________________________

4. Financing: Please indicate what percent of payment for your child's participation in horseback riding comes from the following sources: (Responses should total 100%)

   Self-Pay Total Amount □ Insurance □ Community Organization □
   Self Pay Partial Amount □ School Program □ Free/No Charge □

5. Length of Time and Frequency of Participation in Horseback Riding:

   How many months has your child participated in Horseback Riding

   On average, how many hours a week does your child participate in horseback riding?

6. Disabilities or Impairments: Using the list below, please check □ any of the problems your child has. Check All that Apply

   Specific Learning Disabilities □ Multiple Disabilities □ Visual Impairments □
   Speech or Language Impairments □ Hearing Impairments □ Autism □
   Mental Retardation □ Orthopedic Impairments □ Deaf or Blindness □
   Emotional Disturbance □ Other Health Impairments □ Traumatic Brain Injury □
   Developmental Delay □

7. What is the primary way you learned about therapeutic horseback riding? Please check □ one response below:

   School Referral □ Newspaper or Ad □ Drive By □
   Medical or Health Referral □ Word of Mouth □ Attended an Event □

8. If there are secondary ways you learned about the program not listed above, please specify:

9. Please rate your child's interest in participating in horseback riding program by circling one of the responses below:

   Not Interested Somewhat Interested Very Interested
10. Parent’s Perceptions of Effectiveness of Therapeutic Horseback Riding

**Directions:** The following statements are a list of child behaviors. Please indicate if you observed an *improvement* in behaviors since your child began horseback riding. Place one check mark □ next to the behavior in the appropriate box to indicate you either:

- **Strongly Agree** that the Behavior Improved
- **Agree** that the Behavior Improved
- **Uncertain or No Change** in the Behavior
- **Disagree** that the Behavior Improved
- **Strongly Disagree** that the Behavior Improved

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<th>Self-Care/Independence Behaviors Improved</th>
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<td>Range of motion</td>
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<td>Muscle strength</td>
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<td>Agree</td>
<td>Uncertain or No Change</td>
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<td>Self-Esteem</td>
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<td>Cooperates (Less Stubborn)</td>
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<td>Satisfaction</td>
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<td>Motivation</td>
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<td>Self-Confidence</td>
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<td>Self-Image</td>
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<td>Positive Attitude</td>
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<td>Taking Responsibility</td>
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<td>Expressing Love</td>
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<td>Industrious</td>
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<td>Happiness (Morale)</td>
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<td>Sense of Calm</td>
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<td>Cognitive/School Learning Improved</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Uncertain or No Change</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
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<td>Memory</td>
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<td>Attention Skills/Span</td>
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<td>Decision-making</td>
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<td>Self-discipline</td>
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<td>Self-control</td>
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<td>School Grades</td>
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<td>Social Communication Interactions Improved</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Uncertain or No Change</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
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<td>Give Information (Expressive)</td>
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<td>Receive Information (Receptive)</td>
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<td>Expressing Self Appropriately</td>
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<td>Gets Along with Brothers and Sisters</td>
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<td>Gets Along with Other Friends</td>
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<td>Gets Along with Family</td>
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<td>Gets Along with Teachers</td>
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<td>Gets Along with Therapists</td>
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<td>Plays Well with Others</td>
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<td>Plays and Works Well Alone</td>
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<td>Participates well in sports, hobbies, clubs, etc.</td>
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11. On the blank line provided below, please rate your perception of the overall effectiveness of therapeutic riding by assigning a rating between 0 and 100, where 0 = no effectiveness at all and 100 = (equals) the highest possible effectiveness: ____________

12. What do you like **best** about Therapeutic Horseback Riding?

13. What do you like **least** about Therapeutic Horseback Riding?

14. What would you like to see improved about Therapeutic Horseback Riding Program? Write your response in the space below

   **Thank you for your participation, Anita Scialli, Doctoral Student at Lynn University**
APPENDIX B

Institutional Review Board Approval and Consent
February 8, 2002

Ms. Anita Scialli

Dear Anita:

The Institutional Review Board has reviewed your proposal entitled “Parent Perception of Adjustment in Children Aged 6-18 with Varying Disabilities who Participate in Therapeutic Horseback Riding”. The Board’s only concern is that there be no identifying information about children on the questionnaires. The Board suggested using case numbers on the questionnaires to insure the confidentiality of the data. You have the Board’s approval to initiate your proposal.

Best of luck with your research.

Sincerely,

Karen Casey-Acevedo, Ph.D.
Chair, Institutional Review Board

Cc: Dr. Fred Dembowski
February 27, 2002

Ms. Anita Scialli

Dear Anita:

The Institutional Review Board has reviewed the revised proposal and consent form for your proposal entitled “Parent Perceptions of the Effectiveness of Therapeutic Horseback Riding for Children with Varying Disabilities”, # 2001-010. The Board has approved your proposal.

Best of luck with your research.

Sincerely,

Karen Casey-Acevedo, Ph.D.
Chair, Institutional Review Board

Cc: Dr. Fred Dembowsk

Directions for the Participant (Parent or Guardian): Please read this consent form carefully. Ask as many questions as you like. Decide whether you want to participate in this study. You are free to ask questions at any time before, during, or after your participation in this study.

PURPOSE OF THIS RESEARCH STUDY: I Anita Scialli, am a doctoral student at Lynn University. I am studying educational leadership. Part of my education is to conduct a research study. You are being asked to participate in my research study about children with disabilities who participate in horse back riding.

PROCEDURES: You will complete a survey that should take about 15 minutes to complete. If necessary, the researcher (Anita Scialli) can help you in completing the surveys.

POSSIBLE RISKS OR DISCOMFORT: This study involves minimal risk. You may find that some of the questions are sensitive in nature. POSSIBLE BENEFITS: There may be no direct benefit to your child in participating in this research. But knowledge may be gained which may help other children in the future.

FINANCIAL CONSIDERATIONS: There is no financial compensation for your participation in this research. There are no costs to you as a result of your participation in this study.

CONFIDENTIALITY: You and your child's identity in this study will be treated as confidential. Only the researcher (Anita Scialli) will know who you are. Data will be coded. Data will be stored in locked files and destroyed at the end of the research. All information will be held in strict confidence and may not be disclosed unless required by law or regulation. If the results of this study are published, you or your child will not be identified by name.

TERMINATION OF RESEARCH STUDY: You are free to choose whether or not to participate in this study. There will be no penalty or loss of benefits to which you are otherwise entitled if you choose not to participate.

CONTACTS FOR QUESTIONS/ACCESS TO CONTENT FORM: Any further questions you have about this study or your participation in it, either now or any time in the future, will be answered by Anita Scialli who may be reached at: [redacted] and Dr. Fred Dembowski, faculty advisor who may be reached at: [redacted]. For any questions regarding your rights as a research subject, you may call Dr. Karen Casey-Acevedo, Chair of the Lynn University Institutional Review Board for the Protection of Human Subjects, at [redacted]. If any problems arise as a result of your participation in this study, please call the Principal Investigator (Anita Scialli) and the
faculty advisor (Dr. Dembowski) immediately. A copy of this consent form will be given to you.

**AUTHORIZATION:**

I have read and understand this consent form. All my questions have been answered to my satisfaction. I have been assured that any future questions that may arise will be answered. I have been informed of the risks and benefits. I voluntarily choose to participate. I know that I can withdraw this consent to participate at any time without penalty. I understand that by signing this form I have not waived any of my legal rights. I further understand that nothing in this consent form is intended to replace any applicable Federal, state, or local laws. I understand that I will receive a copy of this form.

Dated signatures that are required are as follows:

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<th>Participant's printed name</th>
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<td>Participant's signature</td>
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<td>Witness Identification</td>
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<td>Witness' Signature</td>
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<td>Date</td>
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**INVESTIGATOR'S AFFIDAVIT:** I have carefully explained to the subject the nature of the above project. I hereby certify that to the best of my knowledge the person who is signing this consent form understands clearly the nature, demands, benefits, and risks involved in his/her participation and his/her signature is legally valid. A medical problem or language or educational barrier has not precluded this understanding.

Signature of Investigator

Date of IRB Approval: February 7, 2002; Revision February 27, 2002
VITA