



8-3-2011

Alleviating Equines: Investigating the Hypothesized Mechanisms of Change in Equine Assisted Psychotherapy

Kathy L. Korell-Rach

Follow this and additional works at: <https://commons.und.edu/theses>

Recommended Citation

Korell-Rach, Kathy L., "Alleviating Equines: Investigating the Hypothesized Mechanisms of Change in Equine Assisted Psychotherapy" (2011). *Theses and Dissertations*. 996.
<https://commons.und.edu/theses/996>

This Dissertation is brought to you for free and open access by the Theses, Dissertations, and Senior Projects at UND Scholarly Commons. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of UND Scholarly Commons. For more information, please contact zeinebyousif@library.und.edu.

ALLEVIATING EQUINES: INVESTIGATING THE HYPOTHESIZED
MECHANISMS OF CHANGE IN EQUINE ASSISTED PSYCHOTHERAPY

by

Kathy L. Korell-Rach
Bachelor of Arts, University of Wyoming, 2004
Master of Arts, University of North Dakota, 2007

A Dissertation

Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

Grand Forks, North Dakota
August
2011

Copyright 2011 Kathy L. Korell-Rach

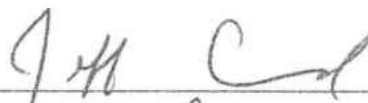
This dissertation, submitted by Kathy L. Korell-Rach in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

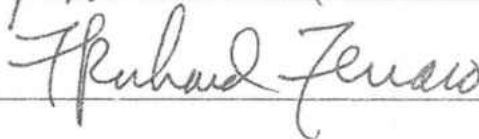


Chairperson

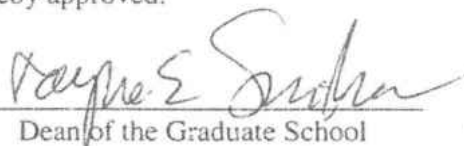


an ll





This dissertation meets the standards for appearance, conforms to the style and format requirements of the Graduate School of the University of North Dakota, and is hereby approved.



Dean of the Graduate School

8-3-11

Date


PERMISSION

Title Alleviating Equines: Investigating the Hypothesized Mechanisms of
Change in Equine Assisted Psychotherapy

Department Clinical Psychology

Degree Doctor of Philosophy

In presenting this dissertation in partial fulfillment of the requirements for a graduate degree from the University of North Dakota, I agree that the library of this University shall make it freely available for inspection. I further agree that permission for extensive copying for scholarly purposes may be granted by the professor who supervised my dissertation work or, in his absence, by the chairperson of the department or the dean of the Graduate School. It is understood that any copying or publication or other use of this dissertation or part thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of North Dakota in any scholarly use which may be made of any material in my dissertation.

Signature 

Date July 19, 2011

TABLE OF CONTENTS

LIST OF FIGURES	vii
ACKNOWLEDGMENTS	viii
ABSTRACT	ix
CHAPTER	
I. INTRODUCTION	1
Animal Assisted Therapy	4
Equine Assisted Psychotherapy	28
Tri-Level Mechanisms of Change (TLMC) Conceptualization	45
Current Study	50
II. METHODS	55
Participants	55
Procedure	56
Methodological Design	62
III. RESULTS	65
Hypothesis 1	67
Hypothesis 2	69
Hypothesis 3	70
Hypothesis 4	71

Hypothesis 5.....	72
Post-Hoc Statistical Analyses.....	73
IV. DISCUSSION.....	78
Hypothesis 1.....	79
Hypothesis 2.....	84
Hypothesis 3.....	86
Hypothesis 4.....	89
Hypothesis 5.....	90
Conclusion.....	91
APPENDICES.....	100
REFERENCES.....	112

LIST OF FIGURES

Figure	Page
1. Figural representation of Tri-Level Mechanisms of Change (TLMC) Conceptualization	99

ACKNOWLEDGMENTS

It is with sincerest gratitude and love that I thank my parents, Gerald and Iva Korell, for instilling in me fervor for horses and the work ethic of a cowboy. I also extend genuine appreciation to my husband, Gabriel Rach, for his tremendous patience and for always believing that this project would be completed.

To Teddy,

the sweet dog that so selflessly gave me refuge and comfort
and wisely taught me about success, joy, frustration, and acceptance

ABSTRACT

Animal Assisted Therapy research was integrated to develop the Tri-Level Mechanisms of Change (TLMC) Conceptualization, which is a comprehensive theoretical framework hypothesizing how Equine Assisted Psychotherapy produces psychological change. TLMC hypothesizes that the strength of human animal bond (HAB) with personal pets accounts for the development of HAB with therapy horses (primary level). The quality of HAB with therapy horses is responsible for producing changes in general psychological constructs (secondary level). Adaptive changes in secondary level constructs account for reductions in mental illness symptoms (tertiary level). Results indicated a significant reduction in tertiary level symptoms, and gains were maintained at follow-up. Primary level attachment to therapy horses and attachment to personal pets both accounted for a significant amount of variance in improvement in self-efficacy scores.

CHAPTER 1

INTRODUCTION

Humans and animals have had a long-standing relationship that originated centuries ago (Reed, 1959). The purposes driving initial domestication are diverse, such as transportation, to assist with work, and to create a ready supply of slaughter animals for food (Beck, 2000). However, it also appears that animals and humans have created a bond that encompasses much more than these exploitative relationships. Approximately 15,000 years ago, humans began to keep animals in their homes as pets (Beck, 2000), most likely for companionship. It appears that pet ownership is common in a variety of cultures and chosen pets are a host of species native to each area (Savishinsky, 1983). In addition, some cultures worship animals (Cantazaro, 2003a; Myers, 1998), assign symbolic significance to interactions with animals (Fine, 2000), use animals as metaphors for human behaviors (Myers, 1998), or believe animals are guardian spirits (Serpell, 2000), which cannot be explained by economic purposes.

Economic reasons also cannot account for the almost 88 million companion animals owned in the United States (American Veterinary Medical Association [AVMA], 2007), and are in direct opposition to the average \$100 in veterinary bills spent annually per companion animal (AVMA, 2007). In addition, a high number of Americans reported that they talk to their pet as if they were a person, consider their pet a confidant (Katcher, 1981 as cited in Beck & Katcher, 2003), consider their pet to be a member of the family

(Cain, 1983; Robin, ten Benschel, Quigley, & Anderson, 1983) believe their pet is "tuned in" to their emotions (Cain, 1983), consider their pet a best friend (Robin et al., 1983), and experience substantial bereavement when a pet dies (Cain, 1983). These behaviors, beliefs, and emotional responses signify that animals may provide social and emotional support.

In response to theoretical underpinnings that animals can induce perceived social support and alleviate distressing emotional states, animals have been assigned a therapeutic role through Animal Assisted Therapy (AAT). The earliest known example of AAT was *therapie naturelle*, which was developed in Belgium in the 9th century and utilized animals to care for individuals who were handicapped (Cantazaro, 2003a). By the late 1700's and 1800's, animals had been used as an alternative to the growing number of insane asylums that spread across the United States (Cantazaro, 2003a; Serpell, 2000). One of these programs was the York Retreat, which taught individuals with severe mental disorders to learn self-control and nurturing skills through animal interactions (Cantazaro, 2003a; McCulloch, 1983; Serpell, 2000).

The beginning of modern investigations into AAT was initiated by Boris Levinson, who observed that a patient responded significantly more favorably to him when the patient came to session early and Levinson's dog was still in the therapy area (Cantazaro, 2003a; Hines, 2003; McCulloch, 1983; Serpell, 2000). A short time later, the first empirical evidence that animals might increase longevity by up to one year after substantial heart-related health problems was published (Beck, 2000). Currently, AAT's impact on physical health has received a significant amount of empirical support, and the National Institute of Health (NIH) now considers the human-animal bond (HAB) to be a

Complimentary/Alternative Medical (CAM) Intervention (Johnson, Meadows, Haubner, & Sevedge, 2003). Recently, researchers have exhibited growing interest in understanding and advancing knowledge concerning HAB and its effect on physical, psychological, and social outcomes (Hines, 2003).

Several species of animals have been utilized in AAT. Recently, *Equus caballus*, also known as horses, have received increased attention for their potential to induce therapeutic gains. In response, several organizations have been created that focus on training, implementing, and researching Equine Assisted Psychotherapy (EAP), including North American Riding for the Handicapped Association (NARHA), Equine Assisted Growth and Learning Association (EAGALA), Equine Guided Education Association (EGEA), Pegasus EAP, Horse-Power, Adventures in Awareness (AIA), Acres for Life (AFL), and Leadership and Horses. In addition, EAP is also a component of organizations that focus on general AAT skills, including Animal Systems, Delta Society, Society & Animals Forum (PSYETA), Minnesota Linking Individuals, Nature, and Critters, Inc. (MNLINC), and People, Animal, Nature, Inc. (PAN-inc.). If one judges EAP success based on organizational development, it appears to be well supported and utilized to alleviate psychological distress. However, it is concerning that EAP and AAT in general has not been well researched, leaving disturbing questions about the efficacy and effectiveness of using animals as a therapeutic device, despite their widespread utilization. In addition, little research has been devoted to understanding ATT or EAP mechanisms of change, which are the underlying techniques and therapeutic components that cause emotional and behavioral symptom reduction and improvements in psychological well-being. Therefore, the following is an evaluation of existing literature

concerning AAT principles with a focus on EAP research findings. The discussion will then turn to a comprehensive theoretical framework proposed to unite research concerning hypothesized mechanisms of change. Finally, the present study, which will examine this framework, will be described and results of this study will be discussed.

Animal Assisted Therapy

Animal Assisted Therapy (AAT), also known as Animal Facilitated Therapy and Animal Assisted Therapy in Counseling, encompasses a wide range of therapeutic techniques in a variety of settings in which an animal is utilized as a catalyst for change. Animal Assisted Activities (AAA) are similar, but are implemented by individuals who are not necessarily health care professionals (Pichot & Coulter, 2007). It appears that animal contact in general may be the primary mechanism of change in both AAT and AAA because research suggests that animal contact, whether the animal belongs to the client or someone else, produces similar positive results (McCulloch, 1983). Since this review will focus on physiological, cognitive, emotional, and social consequences of animal contact, AAT and AAA will be discussed together under the umbrella term of AAT.

Unlike other therapeutic techniques, AAT enjoys input from multidisciplinary fields including human medicine, veterinary medicine, psychology, counseling, and sociology (Hines, 2003). There are two main theoretical perspectives to explain why humans generally have a propensity to interact with animals (Beck & Katcher, 2003). The first is the biophilia hypothesis, which conceptualizes the HAB as an evolutionary mechanism whereby humans have a genetic predisposition to notice and attend to animals because of their importance in hunter societies for sustenance (Kellert & Wilson, 1993 as

cited in Beck & Katcher, 2003). The second is the social support theory (Lynch, 2000 as cited in Beck & Katcher, 2003). According to the social support theory, caring for animals teaches valuable life skills, such as nurturance and dealing with and understanding death (Melson, 2003). Both the biophilia hypothesis and social support theory provide theoretical groundwork for the creation and implementation of AAT (Katcher, 2000).

Typically, AAT focuses on utilizing the HAB in goal-directed, time-limited therapy and is easily incorporated into individual, couples, and group therapy formats (Chandler, 2005). Animals can be incorporated into directive and non-directive therapies (Chandler, 2005), such as Solution Focused therapy (Pichot & Coulter, 2007), Couples therapy (Russell-Martin, 2006), Narrative therapy (Fine, 2000b), Experiential therapy (Klontz, Bivens, Leinart, & Klontz, 2007), and Person-Centered therapies (Chandler, 2005).

The HAB is characteristically formed and terminated easily, and is created based on shared factors; these factors can be established on similarities the client perceives about the self and the animal or on qualities the animal conveys that the client desires (Chandler, 2005). Clients may be more able to trust the animal than the therapist because animals do not differentially respond to individuals based on appearance, socioeconomic status, or disability the same way that humans are prone to do (Chandler, 2005; Hart, 2000; Pichot & Coulter, 2007). Animals also typically exhibit behaviors suggesting they find human attention and physical interaction rewarding (Hart, 2000; Pichot & Coulter, 2007). Because of this, clients may experience the animal as a support during difficult therapy processing, and the therapist can utilize the developing HAB to infer and reflect

client relationship patterns and convey empathy (Chandler, 2005). Person-Centered approaches to the therapeutic relationship focus on genuineness, unconditional positive regard, and accurate empathy as being important considerations in treatment (e.g., Rogers, 1957), which has been substantiated by empirical research (see Prochaska & Norcross, 2007a). Although the HAB is easily created, the goal is for the HAB to facilitate, not replace, the therapist-client relationship (Chandler, 2005; Mallon, 1992). In fact, the majority of therapists utilizing animals in therapy reported that they do so to facilitate rapport building (Rice, Brown, & Caldwell, 1973 as cited in Fine, 2000b).

The client may also perceive his or her own characteristics within the animal, such as vulnerability, desire for nurturance, or need for adaptive relationships (Chandler, 2005). This hypothesized component is not unlike Freudian conceptualizations of displacement (see Prochaska & Norcross, 2007b). The therapist can identify these concerns in the animal first, thereby decreasing client discomfort from learning about undesirable self-characteristics and facilitating the process of evaluating and working through concerns (Chandler, 2005). In addition, animals may be a catalyst for emotions by generating laughter and soothing stimuli, as well as by providing opportunities to observe how excessive emotion and reactive behaviors affect animals (Fine, 2000b). These capabilities are similar to cathartic experiences recommended by psychoanalytic conceptualizations of therapy (see Prochaska & Norcross, 2007b).

Animals might also be helpful in role modeling activities that are common across various therapeutic conceptualizations, including Cognitive Behavioral Therapy (CBT) and Gestalt therapy. Clients are able to observe the loving relationship between the animal and the therapist, which might teach about appropriate interpersonal relationships

built on trust and responsibility (Fine, 2000b). Due to animal nature, owners and therapists are often required to place boundaries on animal behaviors (Fine, 2000b). This process can allow a child to understand how boundaries are not arbitrary while teaching parents specific discipline strategies and the behavioral learning conceptualizations they are based upon (Fine, 2000b).

Therapy focused on behavioral, emotional, or cognitive change is typically a difficult, at times painful, procedure, and clients often discontinue therapy because of this challenge. To combat premature termination, animals may provide entertainment that increases the likelihood of return therapy visits (Chandler, 2005; Fine, 2000b; Holcomb & Meacham, 1989). Clients' desires to interact with therapy animals may overcome their apprehensions about anticipating discussing difficult topics in the next session. In addition, petting or playing with an animal may provide calming and distracting stimuli to allow an individual to reveal distressing information he or she would feel otherwise uncomfortable discussing (Chandler, 2005). Animals may also provide a surrogate for therapeutic touch (Chandler, 2005), which is generally counter-indicated for therapists to perform due to ethical concerns (American Psychological Association, 2002).

AAT may be utilized to attain a number of psychological treatment goals, including improving social skills, brightening mood, addressing grief, improving self-worth, improving problem-solving, reducing anxiety, facilitating health, reducing abusive behavior (Chandler, 2005), encouraging positive activity focus, learning to focus attention on an external source (Granger & Kogan, 2000, Pichot & Coulter, 2007), and improving nonverbal behavior (Granger & Kogan, 2000). These goals may be addressed through common AAT techniques, including touching or playing with the animal.

training the animal, requesting the animal to perform behaviors, talking about the animal, talking to the animal, observing the animal, learning about proper animal care, following instructions involving the animal, and learning behavioral principles through animal interaction (Chandler, 2005; Granger & Kogan, 2000).

Institutional programs, primarily in hospital or assisted living environments, were the first attempts at using animals for therapy (Beck, 2000). From these programs, therapy animal use can be categorized in two ways: as mascots and as components of the environment (Beck, 2000; Cantazaro, 2003b; McCulloch, 1983). Mascots are pets that belong to an institution, and individuals living in the facility are allowed to interact with the pet without claim of ownership to the animal (Cantazaro, 2003b; McCulloch, 1983). Examples would be a cat that lives in an assisted living facility and roams the halls freely or a therapist who has a dog in the therapy room or office area. Animals can also be part of the environment and are viewed as residents of the community of all living things in the area (Cantazaro, 2003b; McCulloch, 1983). Examples would be livestock that prison inmates care for as part of their work release program or residential treatment centers in rural settings with wild animals on the property.

Research has also examined non-institutional programs for older adults based on the theory that animals may provide companionship and social support to elderly individuals (Beck, 2000; Pichot & Coulter, 2007). Animals utilized in these programs can be considered part-time companions or individual companions (Cantazaro, 2003b; McCulloch, 1983). Part-time companions are animals that are brought to interact with individuals for a specific period of time, but are owned and cared for by someone else (Cantazaro, 2003b; McCulloch, 1983). Examples include pets that visit elderly

individuals at home or animals that perform specific behaviors for entertainment. Individual companions are pets owned by the person they are benefiting (Cantazaro, 2003b; McCulloch, 1983). Individual companions typically include personal pets (Beck, 2000) as well as specially trained service animals to assist those with disabilities, including populations of those with deafness or blindness (Beck, 2000; Cantazaro, 2003b). Service animal use is rising due to legislation requiring service animal access in public areas and because individuals have reduced health care costs from primary professional service providers when service animals increase autonomy (Duncan & Allen, 2000).

Disorders characterized by substantial cognitive decline, such as Alzheimer Disease and Parkinson Disease, are becoming more prevalent in American society as the average life expectancy continues to rise. Because of these changes, dementia has received increased research and clinical attention in recent years (see Fisher, Zeiss, & Carstensen, 2001; Heindel & Salmon, 2001). In addition to cognitive decline, elderly populations often experience decreased physical abilities, increased bereavement, increased loneliness, and disengagement from social activities; these increased psychosocial stressors translate into rising epidemiology of mood and anxiety disorders in older age (see Fisher, Zeiss, & Carstensen, 2001).

Filan and Llewellyn-Jones (2006) conducted a review of 13 studies that used controlled trials to examine AAT for decreasing behavioral and psychological symptoms of dementia. They concluded that subjects in AAT groups exhibited significantly less problematic and aggressive behaviors, significantly more appropriate verbal and nonverbal communication, significantly more prosocial behavior, and significantly more

food consumption than those not exposed to animals. Other research has also found improvements in cognitive functions for elderly who were allowed to play with dogs (Kawamura, Niiyama, & Niiyama, 2007) and increases in social behavior and decreases in agitated behaviors from contact with companion animals (Baun & McCabe, 2003) and therapy dogs (Sellers, 2005). In addition, after implementing Human Habitat, which is a nursing home housing more than 100 birds, four dogs, two cats, and several rabbits, resident use of psychotropic medications, particularly tranquilizers, was decreased (Thomas, 1994 as cited in Allen, 1995). There were also 15% fewer deaths at an 18-month follow-up after the program began as compared to a control nursing home without animals (Thomas, 1994 as cited in Allen, 1995).

Multiple studies suggest that AAT can decrease feelings of loneliness that often accompany old age. Pets might fill roles that are otherwise vacant; they can be substitutes for those who are single, widowed, or childless (Savishinsky, 1983). In addition, research suggests that dogs may act as "social lubricants" (p. 45) by increasing the likelihood of interaction between the dog handler and strangers (Messent, 1983), and others are more likely to positively perceive those who have animals (Lockwood, 1983). Banks and Banks (2005) found that weekly 30-min sessions of dog contact for six weeks produced significantly decreased feelings of loneliness, as assessed with the UCLA Loneliness Scale (Russell, 1996). Those with initially higher loneliness scores experienced significantly greater decreases in loneliness after the AAT, which suggests that AAT may be particularly beneficial for those experiencing a great deal of loneliness (Banks & Banks, 2005). In addition, there was no difference between those who received group AAT and those who received individual AAT, which suggests that group AAT gains are

not only due to interaction with other humans during typical group experiences (Banks & Banks, 2005). These findings were replicated in three long-term care facilities, which suggests that these effects are robust (Banks & Banks, 2005).

What is especially noteworthy about research examining animal effects on geriatric populations is that each study used different types of AAT, which included individual sessions with a dog or cat and handler, group sessions with a dog freely roaming about the group, individuals with companion animals in their personal home, dog or cat institution mascots, and fish tanks in the dining area. In addition, interventions ranged from a 10 min session to permanent animal placement. When considering the diversity of AAT interventions and the positive outcomes obtained, it appears that the presence of an animal may be a facilitating mechanism for increased cognitive, behavioral, and emotional functioning in this population.

However, pet ownership also poses some problems for elderly individuals. As individuals age, they may become unable to adequately care for their pets yet may also be reluctant to find more appropriate placement for them (Lago, Knight, & Connell, 1983). In addition, individuals who are strongly attached to their pets exhibit less willingness to be hospitalized because of concern for their pet's welfare, which can have serious negative health consequences (Friedmann, Katcher, & Meislich, 1983). Pet death is also a component of pet ownership, which can induce sadness and bereavement (Quackenbush & Glickman, 1983); however, research suggests that half of those who lose a pet will later bond with a new pet (Harris, 1983).

As well as assisting those who are older, animals may provide a special opportunity for emotional and cognitive growth in child development. Before children

learn culturally desired characteristics such as responsibility, self-control, rationality, and morality, they can be conceptualized as sharing the "original wildness" (p. 22) found in untrained animals; at the same time, both children and animals are also generally viewed as being "innocent, natural, and good" (Myers, 1998, p. 25). Perhaps it is because of these commonalities that animals may have a profound effect on child development. It is remarkable that classical conditioning and operant conditioning paradigms are equally effective for humans and animals without higher-order cognitive functioning, such as rats. When considering the pervasiveness of these learning principles, the small amount of genetic variance separating humans from primate species (Diamond, 1992), common socialization patterns of humans and animals (Manning, 1983), and the occurrence of critical periods for learning in both animal and human development (Manning, 1983) the possibility arises that humans are more similar to animals than researchers may have previously believed. It is possible that these similarities are why animals often sustain children's attention, why children want to interact with and care for them (Myers, 1998), and why animals are often important characters in children's dreams (Van de Castle, 1983).

Most humans derive pleasure from interactions with animals (Manning, 1983; Smith, 1983), and they often treat animals similar to their own children (Manning, 1983). Animals may provide understanding about qualities of life such as biological functioning and death (Melson, 2003), which experiences with other humans may not readily provide (Myers, 1998). By understanding animal behavior children may learn about themselves and their interactions may facilitate social skills with other humans (Myers, 1998).

Similarly, children may gain compassion and morality through caring for another living creature (Myers, 1998).

As children develop and become mobile, they begin using the parent as a model for how to interact with the world, which is evident through social referencing behaviors (e.g. Ainsworth, Blehai, Waters, & Wall, 1978; Bowlby, 1969). This pattern is similar in rhesus monkeys raised with their natural parents (e.g. Harlow & Harlow, 1962). Mason (1983) found that rhesus monkeys raised with a foster dog parent were more interested in their surroundings, were better at solving problems, exhibited more active investigation of the environment, and looked longer at pictures of dogs than monkeys raised with a toy horse as a surrogate parent. This suggests that monkeys modeled their foster parents' behavior patterns. Similar results have been found with early puppy (Fuller, 1977) and kitten (Karsh, 1983) socialization. Perhaps animals have similar effects for children in that they provide another living being to model in addition to human interaction and may provide resiliency factors in abusive or neglectful homes.

Robin et al. (1983) found that there was no difference in pet ownership between typical adolescents and juvenile delinquents. However, there were substantial differences in how the youths interacted with their animals. Substantially more non-delinquent adolescents considered their pet a family member than juvenile delinquents; however juvenile delinquents perceived their pet as the "sole love object and a substitute for family love" (p. 439). Juvenile delinquents were also more likely to interact with their pets when they felt lonely, seek emotional support from pets, and talk to their pets about their problems compared with non-delinquent youths. Occasionally, juvenile delinquents reported that their pet protected them from others who might injure them, including

abusive family members. Overall, 78% of the delinquent respondents and 61% of the typical adolescents reported that having a pet during their childhood was important.

Other research also supports the importance people assign to animal ownership. Poresky, Hendrix, Mosier, and Samuelson (1988) conducted a retrospective study of college students' pet ownership and correlates for interpersonal relationships and self-concept. Results indicated that previous or current pet owners first had a pet on average when they were six and one-half years old. Interestingly, childhood HABs were more strongly related to positive self-concept than contemporary HABs. Additionally, subjects who first had pets from birth to five years old and subjects who first had pets during adolescence had stronger self-concepts than those who first obtained pets in middle childhood. Because of these differences, it is possible that animals facilitate personal growth at particular developmental stages. Stronger bonds with animals in childhood were more predictive of current HABs than were relationships with parents, siblings, and classmates, suggesting that HAB potentials are developed in childhood and remain consistent across the life span. It appears that strength of HAB may be more important in understanding the beneficial effects of animal companionship than simply examining animal ownership.

It appears that the manner in which children interact with dogs can correctly diagnose a variety of psychological and developmental disorders (Prothmann, Albrecht, Dietrich, Hornfeck, Stieber, & Ettrich, 2005). Prothmann et al. (2005) had experimentally blind raters code 40 participants' unstructured interactions with pointer, sheepdog, and terrier breeds of therapy dogs. Raters noted participants' postures, behaviors toward the dog, eye contact, verbal behaviors, and physical contact. Results indicated that 77.5% of

the participants were correctly diagnosed based only on 25 min of dog interaction, including 90% of anorexic and autistic subjects, 70% of bulimic subjects, and 60% of anxiety disordered subjects. A logical extension of these results is the possibility of utilizing AAT to correct behaviors and emotions associated with disorders or using future diagnostic sessions with animals to evaluate treatment gains. These results also lend credibility to understanding HAB as containing similar factors of human relationships. AAT may provide a simple and cost-effective way to address interpersonal relationship concerns in the therapy room using a less intimidating and more natural means as compared to role-playing with the therapist or relying primarily on homework.

Similarly, research suggests that animals may facilitate communication in children with developmental disorders. Smith (1983) found that eight autistic children made more speech sounds, exhibited consistently sustained attention, and cooperated more during and after interactions with Atlantic bottlenose dolphins. Michael, who was an 18-year-old nonverbal autistic child, began producing clicking sounds similar to those dolphins produce. These vocalizations were uncharacteristic for Michael and reoccurred when he was exposed to dolphin stimuli for several years after the AAT ended. Similar results have been found for language-delayed nursery school children between the ages of 3 and 5 years old (Condoret, 1983). Condoret (1983) exposed children to a terrier dog and a cat within the preschool environment. Results indicated that children were more able to correctly pronounce words related to the animals and began structuring their sentences more completely. These results suggest that animals may facilitate speech acquisition and more appropriate communication abilities. AAT has also been found to effectively treat childhood psychological disorders. Inpatient children and adolescents

appear to experience significant changes in mind states, including vitality, alertness, extroversion, and intra-emotional balance, after 30 min interactions with therapy dogs; these effects were stronger for individuals with higher levels of initial mind state dysregulation (Prothmann, Bienert, & Ettrich, 2006).

In addition to skill acquisition, animals may also increase primary and secondary coping mechanism development. Death is a difficult part of development, and pet death may provide important learning and coping opportunities. Stewart (1983) examined a group of 135 children and 52 adults who had a pet at some time, including dogs, cats, budgies, rabbits, fish, hamsters, gerbils, and ponies; sixty-two children reported having a pet that died. Approximately one-third of the children reported that the circumstances of the death were significant and two-thirds reported experiencing sadness. The majority of these children reported that they had worked through the loss and many reported that talking with other people or getting another animal helped them cope with their sorrow. All of the adults reported experiencing sadness in response to pet death, but the majority were able to effectively cope with their loss. They reported experiencing aspects of bereavement, such as numbness, imagining the pet was still alive, difficulty sleeping and eating, guilt, and anger that are common reactions to human death. Results of this study suggest that children gain experience with death and subsequent bereavement and coping that might make them more resilient when faced with human death as adults. However, research has not adequately addressed this possibility.

Overall, the H.A.B is theorized to positively affect a wide range of functioning in individuals with a variety of demographic characteristics. Due to the hypothesized general influences animals may have on human functioning, AAT has been applied in a

multitude of settings through a host of different techniques. The following is a brief summary of available research examining AAT effects for psychological disorders and psychosocial clinical concerns.

Physical Health

Research suggests that some animals can contribute to better physical health (e.g. Pichot & Coulter, 2007; Friedmann, 2000). Dog ownership has been correlated with increased survival rates following medical treatment for heart conditions, and pet ownership may be a protective factor against developing risk factors for coronary heart disease (Friedmann, 2000). Friedmann and Thomas (1995) examined pet ownership and its relationship to mortality through the Cardiac Arrhythmia Suppression Trial (CAST). Several ethnicities, genders, educational levels, and relationship statuses were represented among the 424 subjects. Results indicated that pet ownership was independently related to survival and individuals with dogs had a significantly higher survival rate at one-year follow-up.

However, it appears that different species of animals may produce significantly different results. Surprisingly, cat ownership may actually be associated with increased mortality (Friedman & Thomas, 1995) and future hospitalization rates (Rajack 1997 as cited in Friedmann, 2000) following cardiac treatments as compared to individuals who do not own pets. These differences may be attributable to the care each type of animal requires. Cats are often solitary creatures and can be kept indoors indefinitely; however, dogs require regular outings for waste excretion and exercise. Dog owners' increased levels of physical activity due to walking their dogs may actually account for the difference in health benefits (Friedmann, 2000). However, a three-year study revealed

that individuals who owned dogs, cats, birds, fish, or horses had significantly lower blood pressure, triglyceride levels, and cholesterol levels than those without pets but there were no substantial lifestyle differences between the groups (Delta Society, 1992). Despite the possibility that animal ownership may be only an indirect cause of better health, individuals who currently exercise more because of their pet might discontinue this activity if a pet was not present. Therefore, the pet itself should not be discounted as an important component of physical health. Regardless of potential differences in physical activity for each type of animal ownership, it is particularly important to evaluate why cats may have a detrimental effect on health, which may provide more concrete understanding about the mechanisms of change in AAT.

In addition to finding indirect links between animal ownership and subsequent health, researchers have also examined short-term animal benefits that could not be accounted for by lifestyle changes animals might facilitate. Research suggests that blood pressure is lowered by watching fish swim in an aquarium (Katcher, Friedmann, Beck, & Lynch, 1983) and by observing an animal one has had previous interactions with (Eddy, 1995, 1996). In response, medical professionals are increasingly incorporating animals into their practices, primarily through installation of fish tanks in waiting areas, to decrease anxiety associated with appointments (Pichot & Coulter, 2007). In addition, simply looking at pictures of animals can influence mood and perception (Friedmann, 2000). Physiological benefits have also been linked to having an animal in the same area even when it is not the focus of attention (Friedmann, 2000).

Animals can also aid in detecting health concerns. Certain breeds of dogs, such as Standard Schnauzers, have been trained to detect cancer cells unobservable to the human

eye with 99% accuracy (Cantanzaro, 2003c). This ability translates into less threatening and less expensive medical procedures; individuals may be more likely to seek medical assistance if they are not intimidated by testing and/or could not afford more traditional medical assessment.

Anxiety Disorders and Physiological Correlates

Barker and Dawson (1998) found that AAT significantly decreased anxiety symptoms in adult psychiatric patients. Individuals in the AAT group received one 30 min session of group interaction with a therapy dog, which included talking about the dog and the subjects' pets while the dog interacted with the group. Individuals in the control group received one 30 min of group interaction that involved music and art activities as well as education about leisure resources in the community. Both the AAT and control groups exhibited significantly lower State-Trait Anxiety Inventory (STAI; Spielberger, 1997) post-test scores after the group compared to pre-test scores before the group. The efficacy of AAT is tentative in this study, though, because there were several methodological problems. Because the two groups obtained a significant reduction in anxiety, perhaps the interaction with the handler or simply engaging in an activity accounted for decreases in anxiety. The findings can also be attributed to test-retest confounds because residents completed the STAI twice within 30 min. Therefore, it is difficult to draw strong conclusions from this study regarding AAT's benefit in reducing anxiety symptomatology.

Similarly tentative results have been obtained with children. Hansen, Messinger, Baun, and Megel (1999) found that two to six-year-old children exhibited less behavioral indications of anxiety, such as crying, screaming, need for restraint, verbal resistance,

verbal reports of pain, and flailing, when a golden retriever was present during medical examinations than when it was absent. However, there were no significant differences in physiological variables, including blood pressure, heart rate, and skin temperature.

Despite the lack of physiological correlates of reduced anxiety, the behavioral differences are important because physicians are more able to examine a child who appears calm than a child who exhibits behavioral correlates of distress.

Anxiety commonly interferes with cognitive functioning, so decreases in anxiety produce increased ability to concentrate. Allen (1995) found that women were able to solve a difficult arithmetic task significantly faster and more accurately when they were in the presence of their dog than when they were alone or with a friend; participants were more likely to respond to the mathematical task as being "challenging" in the presence of the dog and "threatening" in the presence of their friend (p. 6). Participants in this study exhibited significantly lower skin conductance, systolic blood pressure, diastolic blood pressure, and heart rate when the dog was present than when their friend was present or when they were only with the experimenter.

Taken together, these studies suggest that AAT may reduce certain aspects of anxiety, but that symptom remission can occur in a variety of modalities depending on the situation. Despite inconsistency in findings, it appears that AAT may offer a promising mechanism to decrease anxious symptomatology. However, future research is required to understand mechanisms of change and explore how situational effects can modulate AAT effectiveness.

Mood Disorders

Evidence supporting AAT effectiveness in decreasing depression using a variety of animal species has been published. However, many of these studies are not well designed and leave multiple interpretations for their results. Souter and Miller (2007) conducted a meta-analysis of research examining AAT's effect on depression, which evaluated five studies that exhibited random assignment, included a control group, used a self-report measure of depression, and provided statistics whereby effect sizes could be calculated. Results of the meta-analysis revealed that AAT using both dogs and/or cats might significantly improve depressive symptomatology with a moderate effect size.

Other valuable and methodologically intact studies were not included in the meta-analysis, but still provide evidence of AAT's benefit for treating depression. Colombo, Dello Buono, Smania, Raviola, and De Leo (2006) found that cognitively intact elderly individuals in an assisted living facility who were given a canary to care for exhibited decreased depression symptoms compared to those given a plant to care for and a control group over three months of observation. This is an important finding because many bird species are inexpensive and easy to care for, and these gains were achieved without mental health professional involvement.

Antonioli and Reveley (2005) also found that AAT using dolphins significantly decreased depressive symptomatology. Subjects met ICD-10 criteria for mild or moderate depression, had not received therapy or taken antidepressant medication for at least four weeks, and were randomly assigned to an animal care program with dolphins or to a control group. The AAT group consisted of learning about dolphin behavior and water safety, watching the dolphins perform behaviors signaled for by a trainer, and snorkeling

in the water with the dolphins where subjects could watch, touch, and interact with the dolphins at their discretion. The control group consisted of learning about the marine ecosystem, the barrier coral reef, and water safety, as well as snorkeling in the water without dolphins. Both groups met for one hour daily for five days a week over a two-week period. Psychological symptoms were assessed using the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, & Erbaugh, 1961) and a modified Hamilton Rating Scale for Depression (Hamilton, 1976) at baseline and at the end of treatment. The AAT group obtained significantly greater decreases in depressive symptoms compared to the control group, and 77% of the AAT group scored below the Hamilton Rating Scale for Depression cutoff score compared to only 25% in the control group.

Attention Deficit Hyperactivity Disorder (ADHD) and Learning Disorders

Children with ADHD are typified by inattention and/or hyperactivity-impulsivity (APA, 2000), which can have profound negative effects on psychosocial functioning, learning, and interpersonal relationships (see Barkley, 1994). Because AAT is theorized to facilitate progress in each of these areas of concern, Katcher and Wilkins (1999 as cited in Katcher & Wilkins, 2000) created a manualized AAT called *The Centaur's Lessons*. This therapy was implemented in a program entitled Companionable Zoo (CZ), whereby children learned about proper animal care and shared animal care responsibilities with zookeepers (see Katcher & Wilkins, 1999, 2000 for a complete description). To evaluate program effectiveness, 55 children aged 7 to 16 years old were randomly assigned to CZ or Outward Bound (OB), which is an outdoor skill program with a focus on increasing self-esteem and responsible behaviors (Katcher & Wilkins, 2000). Children participated in the programs for approximately five hours per week for

six months, after which participants were switched and CZ subjects began OB, and vice versa, for the same duration.

Results indicated that the CZ participants exhibited significantly higher attendance rates than OB participants during both periods and children who had high performance levels in CZ visited the zoo more often in their free time (Katcher & Wilkens, 2000). Taken together, these results suggest that children enjoyed the CZ program more than OB, which is an important factor in whether a child will attend to and persist at a task. Skills learned through the CZ program were formalized by considering the number of tasks mastered, formal quizzes, and weekly progress reviews to assess active learning. Results indicated that 80% of the children learned more through CZ than with traditional within-classroom teaching strategies. In addition, externalizing behavior problems in the regular school setting were significantly lower for CZ subjects than OB subjects at six months follow-up as assessed using the Child Behavior Checklist (CBCL; Achenbach, 1991) and Teacher Report Form (TRF; Achenbach, 1991). Overall, results of this well-controlled study suggest that AAT can effectively decrease problematic behaviors found in children diagnosed with ADHD. Although it was not tested, Katcher and Wilkins (2000) suggest that this program may also be beneficial for other disorders characterized by externalizing behaviors, such as conduct disorder and oppositional defiant disorder.

Similar results were obtained by Fine (1992, as cited in Fine, 2000b) through the Pets Are Loving (PAL) project, which is a 10-week long structured program whereby children used their animals as a way to become mentors to elderly in the community. It was designed to increase responsibility and feelings of self-esteem in children with

ADHD and learning disorders. Results indicated that the majority of the children and elderly enjoyed the program. In addition, children's stereotypes about aging were corrected, they learned communication skills, and internalized and exhibited appropriate behaviors. However, there were several limitations to this study, including that the data collection was qualitative and there was not a control group.

Schizophrenia

Schizophrenia is typically conceptualized as a profound condition whereby complete symptom remission is uncommon and the most frequent treatment focuses on pharmacotherapy with medications that have serious side effects (see Sanislow & Carson, 2001). Kovacs, Bulucz, Kis, and Simon (2006) examined AAT with three paranoid schizophrenic and two disorganized schizophrenic subjects housed in a day-care unit; none of the subjects had sufficient social support or intimate relationships. A therapy dog was used in weekly 50 min sessions for six months to enhance verbal and non-verbal communication, psychomotor abilities, and concentration through animal care activities and role-playing using the dog. The authors found improvements for subjects' verbal communication in non-therapy atmospheres, non-verbal communication including interpersonal space and gestures, and psychomotor movements. Enhanced communication from AAT is also supported by research revealing that the presence of a therapy dog may facilitate communication skills in individuals with aphasia (LaFrance, Garcia, & Labreche, 2007).

All patients continued AAT willingly, despite deteriorating physical health in one client and a psychotic relapse in another (Kovacs et al., 2006). This is important because treatment compliance is often difficult to attain with schizophrenic clients. Although this

study is limited because of its small sample size, it still provides evidence that AAT may be effectively utilized with severely disordered populations. Given the inherent difficulties and typically poor treatment outcomes with alleviating psychosocial symptoms associated with schizophrenia, this study suggests that AAT may be a particularly robust treatment option. Other research suggests that perhaps individuals with schizophrenia or severe organic mental disorders with an intermediate level of impairment may benefit significantly more from AAT than those who have higher or lower levels of impairment (Thompson, Kennedy, & Igou, 1983).

Criminal Behavior

AAT with criminal populations is thought to originate during World War II in Camp Stark, which was a United States prison camp for German prisoners of war (POWs) (Strimple, 2003). POWs adopted wild animals, including rabbits, crows, and bear cubs, that they found while working outside the compound (Koop, 1988 as cited in Strimple, 2003). Since that time, AATs have enjoyed increasing prolific expansion in the judicial system. According to a national survey, AAT programs are being used in prisons in most states (Furst, 2006) as well as in Canada, England, Scotland, Australia, and South Africa (Correctional Service of Canada [CSC], 1998). It appears that AATs may lower recidivism rates as well as state costs to house inmates for repeat offenses. One such example is a correctional center superintendent's observation that none of the inmates involved in an AAT program had been arrested again (Strimple, 2003). However, this has failed to be replicated in empirical research (Cushing, Williams, & Kronick, 1995). There are also financial benefits for implementing programs because lower recidivism rates

translate into lowered housing costs (Strimple, 2003) and some prisons have been able to use these programs for revenue or required vocational programs (Furst, 2006).

Several animal species have been utilized for treating both adult and juvenile offenders, at times by accident. In 1975, an inmate with psychiatric disorders found an injured sparrow in the prison yard and proceeded to nurse it back to health (Lee, 1983 as cited in Strimple, 2003). Unaware of the bird, the facility's psychiatric social worker noticed a substantial improvement in this individual and sought to find the cause. After recognizing the healing properties animals might have, a year-long study was conducted revealing that those able to care for animals required half the medication, exhibited reduced violence, and had no suicide attempts compared to those who did not have animals (Lee, 1983 as cited in Strimple, 2003). Other programs involve having inmates interact with animals for the benefit of society, such as caring for injured cats or training dogs to make them ready for adoption (Strimple, 2003). Results of these studies indicate that inmates experienced increased self-esteem and developed occupational skills (Strimple, 2003). In addition, many feel that they have contributed to the community by training animals for specific purposes, such as Seeing Eye dogs or epileptic seizure alert dogs, and this connection with others has facilitated their reintegration into society (Strimple, 2003).

Fournier, Geller, and Fortney (2007) evaluated PenPals, which is a program whereby dogs are taken from animal shelters and trained by prison inmates in a therapeutic community for eight to ten weeks. Inmates were carefully screened for appropriateness in the program and 48 participants were assigned to the AAT group or a waitlist condition. Results indicated that the AAT group progressed through therapeutic

community treatment goals significantly faster than the waitlist group. In addition, the AAT group exhibited a significant increase in social sensitivity as measured using the Social Skills Inventory (SSI; Riggio, 1986). The waitlist group actually exhibited a decrease in social sensitivity, which suggests that AAT may produce substantial gains in an environment where social skills may typically be inhibited.

Recently, horses have become more significant in prison programs, primarily due to a contract between the National Organization for Wild American Horses (NOWAH) and the Bureau of Land Management (BLM) for inmates to periodically round up excess wild horses and train them before they are adopted by private individuals (Strimple, 2003). EAP prison programs will be discussed later in more detail in the context of EAP research.

Counterindications

Although AAT has shown promise in decreasing symptoms for a wide range of mental disorders and psychosocial clinical concerns, there are several categories of individuals who would be less likely to benefit from AAT. Individuals who dislike or abuse animals should not receive AAT (Chandler, 2005; Hart, 2000). Similarly, those who have developed a phobia from an animal-related event are counterindicated for AAT, unless the animal is used in exposure and desensitization procedures (Chandler, 2005). Those who like animals may be clinically different than those who do not, which may account for differential treatment gains between the two groups (Hart, 2000). People who enjoy pets may also possess additional skills, such as making good decisions, dependability, intellectual involvement, and self-confidence (Hart, 2000) that may make these individuals more likely to benefit from AAT. In addition, the major tenant of AAT

is that therapeutic gains are through the HAB and individuals who dislike or are fearful of animals are substantially less likely to develop adequate HABs. Clients should be allowed to set the parameters for animal activities, and therapists should respect clients who decline AAT or request to receive it later in therapy (Chandler, 2005; Pichot & Coulter, 2007).

Animals may also pose additional problems for those who do like animals. Animal behavior, regardless of the training level, is unpredictable and there is always a risk of client or animal injury (Chandler, 2005); however, there is no current review available that examines the prevalence of animal or client injury in AAT. In addition, many people are allergic to various animal species, and animals carry a variety of zoonotic diseases, which may be transmitted to clients; this concern is especially important for immunocompromised individuals (Gorzycza, Fine, & Spain, 2000). Clients may also become overly attached to the animal, which can cause increased distress at therapy termination and may require grief counseling (Chandler, 2005). To address these concerns, several animal welfare and training techniques have been developed by many organizations. The main tenants of these guidelines are appropriate training for the animal and therapist, proper animal health care, adequate client screening techniques, understanding of cultural differences, and appropriate supervision of animal-human activities (Pichot & Coulter, 2007).

Equine Assisted Psychotherapy

Therapy activities involving horses are known by several terms, including Equine Assisted Psychotherapy (EAP), Equine Facilitated Psychotherapy, Equine Facilitated Learning, Equine Assisted Therapy, Equine Facilitated Therapy, and Hippotherapy. In

order to provide consistency throughout this review, all therapy activities involving horses will be referred to as EAP, which highlights the theoretical psychotherapeutic role connected to involving horses in the therapeutic process and differentiates it from other programs utilizing horses for physical rehabilitation purposes only.

EAP utilizes many of the same theoretical bases and techniques described earlier in the context of AAT. However, there are some important additional considerations in using horses for psychotherapy. The first is the obvious size difference between equines and other animals typically used for AAT, such as dogs, cats, birds, and fish. Due to their biological differences, horses are associated with larger housing requirements, increased veterinary and feeding costs, and increased amount of time caring for them such as waste removal and exercise requirements (Jones, 1983). In addition, significantly less people own horses than other animals (AVMA, 2007). Horse-related activities carry increased risk for injury to the client and handler because of the activity nature and physical characteristics. It also appears that there is a significant genetic component to equine behavior and performance capabilities (e.g., Hausberger, Braderer, Le Scolan, & Pierre, 2004). Therefore, horses must be selectively screened for therapy purposes and clients must be fully informed about, and willing to accept, inherent risks associated with EAP activities.

Given these limitations, EAP is hypothesized to have several specific advantages over other forms of AAT, even though there have been no empirical studies examining whether EAP is more effective than AAT with other animals. From a health perspective, adult horses housed in clean living areas pose substantially decreased risk for transmitting zoonotic diseases to their handlers as compared to other common AAT species such as

cats, dogs, and birds (Gorczyca, Fine, & Spain, 2000). As mentioned previously, horses can be intimidating because of their physical attributes, but these elements are perhaps the reason horses may be therapeutic (O'Connor, 2006). When humans interact with horses, they are seeking control of horse behavior and must seek a balance of requesting behavior and waiting for behavior to occur to gain control (Irwin & Weber, 2001). When clients are able to master a new skill or develop a relationship with this impending creature, they obtain enhanced self-confidence and self-efficacy to be able to tackle challenges in the future (Marx & Cumella, 2003), and establish an internal locus of control (McCormick & McCormick, 1997).

In addition, learning to trust a creature that could potentially cause self-harm allows clients to work through relationship issues and learn to trust others (Marx & Cumella, 2003; O'Connor, 2006). Since horse socialization in the herd is similar to human socialization, horses may enable clients with interpersonal difficulties to learn to interact with others appropriately (McCormick & McCormick, 1997). Similarly, parents can learn parenting strategies through observing the mixture of discipline and nurture mares provide their foals (McCormick & McCormick, 1997). Clients are also able to solidify their self-concept in comparison to the horse (O'Connor, 2006), which may have strong implications for body size concepts in those with eating disorders (Marx & Cumella, 2003). Many clients have concerns about embarrassing themselves because they have not had exposure to horses in the past, and working through this worry allows clients to develop self-acceptance and encourages clients to engage in novel situations in other settings (Marx & Cumella, 2003).

Horses have been renowned for their sensitivity to non-verbal communication (e.g. Dougherty & Lewis, 1993; Hall, 2006; Irwin & Weber, 2001), and evidence exists suggesting that horses are able to categorize visual stimuli in a manner similar to humans (e.g., Hall, 2007; Hanggi, 1999, 2002). Horses may also be able to form strong bonds with humans, but humans must understand horse behavior to gain their trust (Dorrance, 1987; McCormick & McCormick, 1997). Dorrance (1987) explained, "The true unity and willing communication between the horse and me is not something that can be handed to someone – it has to be *learned*" (p. 6). Horses interact primarily through non-verbal communication, so learning this body language can teach clients to attend to and accurately interpret non-verbal communication as well as monitor and correct their own body language (Marx & Cumella, 2003). Horses are instinctive creatures and provide concrete means to understand our drives and needs (McCormick & McCormick, 1997). These abilities allow horses to be a mirror for clients by accurately reflecting and providing greater insight for emotions (Marx & Cumella, 2003; McCormick & McCormick, 1997), provide honest feedback about behavior in interpersonal relationships, reduce impulsiveness, increase assertive behavior, and provide clear boundaries (Marx & Cumella, 2003).

In addition to reflecting emotions, horses also appear to elicit emotions because horse behavior suggests that each horse has a distinct personality and moods (Irwin & Weber, 2001). Elicited emotions can range from discord and anxiety to harmony and pleasantness, which all provide prime therapeutic opportunities for emotional growth (McCormick & McCormick, 1997). Horses can decrease anxiety through the calming experience of touch through grooming activities (McCormick & McCormick, 1997) as

well as create anxieties and fears so clients can learn how to overcome them through experiencing affection from the horse (Marx & Cumella, 2003). The emotional connections many clients report experiencing with horses might also facilitate spiritual growth (Marx & Cumella, 2003; McCormick & McCormick, 1997). In addition to these gains, simply engaging in activities with horses allows clients to be distracted from their mental illness concerns and allows interaction to decrease feelings of isolation (McCormick & McCormick, 1997; Marx & Cumella, 2003). By learning to provide basic care for horses and caring for them if they become ill or injured, clients learn compassion and responsibility (McCormick & McCormick, 1997). When a horse's mood is incongruent with the handler, the client can learn perspective taking and conflict resolution (McCormick & McCormick, 1997).

Horses may also provide physical benefits, and they have been utilized in physical therapy as well (Gammonley, Howie, Kirwin, Zapf, Frye, Freeman, & Stuart-Russell, 1996). The natural gaits of horse movement provide sensory stimuli in close proximity to normal pelvic movement during human walking (Fleck, 1997; Gammonley et al., 1996). Similarly, riding horses provides mobilization of the pelvis, lumbar spine, and hip joints, stimulation for adequate muscle tone, and increased postural control for those with paralysis or injury (Gammonley et al., 1996). Horse riding can also promote sensorimotor integration to produce positive gains in tactile sensitivity, equilibrium deficits, body awareness, spatial orientation, respiration, circulation, and intestinal functions (Gammonley et al., 1996). Riding horses has been found to facilitate physical rehabilitation for individuals with multiple sclerosis (Selvinen, 1997), chronic pain (Werkersen & Stewart, 1997), mild cervical weakness due to spastic quadriplegia and

cerebral palsy (Haartz, 1997), gross motor difficulties associated with cerebral palsy (Hansen, 1997; Wasserman & Keency, 1997), passive hip abduction difficulties due to cerebral palsy (Fox & Peterson, 1997), manual gripping difficulties due to motor disability from cerebral origin (Hoff, 1997), physical disabilities (Brock, 1997), balance difficulties due to traumatic brain injury (Sykes, Gouge, Newstead, Freeman, Tomberlin, & Mossberg, 1997), and daily living difficulties due to traumatic brain injury (Cook, 1997).

There are a variety of EAP activities, including discussing horse safety and horse body language, choosing a horse to work with and developing a relationship with it, haltering, leading, and grooming a horse, learning to saddle and bridle a horse, learning how to control a horse with verbal and tactile stimuli, role playing, riding with a saddle or bareback, riding through an obstacle course or on a trail, riding different gaits such as walking, trotting, and loping (Chandler, 2005), and observing others in these activities (McCormick & McCormick, 1997). Often these activities are developed from basic components of gentling, training, grooming, and fundamental care (McCormick & McCormick, 1997).

In personal accounts of working with horses, individuals often report almost *magical* experiences. For example, Nilson (2004) wrote:

I believe horses are one of the world's best-kept secrets. We come to them tired, discouraged, ill, and confused. They send us home refreshed, renewed, and full of life and hope for tomorrow. By just being themselves they can bring an emotional and mental healing that other forms of therapy cannot. Patient's lives can be enriched. The intimate, emotional relationship that is shared between horse and

humans is a profound psychological experience...Put horses and humans together.
Miracles will happen (p. 42).

Similarly, Kohanov (2001) devoted an entire book to describing the transformation she experienced in response to her relationship with horses. A slightly more scientific approach to understanding EAP is through case studies, which have been utilized and published as testament to the therapeutic abilities of horses (e.g., Chandler, 2005, Christian, 2005; McCormick & McCormick, 1997); however, case studies and personal experiences are fraught with difficulties in making strong claims. While these accounts are appealing and compelling, they offer little empirical evidence to substantiate the healing abilities horses may possess. Therefore, EAP has received increased scientific attention in recent years.

Bizub, Joy, and Davison (2003) investigated an EAP program created between Fellowship Place, Inc., which serves psychiatric populations, and High Hopes, Inc., which is a therapeutic riding center. Five adult subjects with primary diagnoses within the schizophrenia spectrum participated in the study; none of them had substantial experience with horses. Subjects met for two hours each week for ten weeks and participated in a three-part session each week. Each session began with horse bonding activities, such as grooming, followed by a mounted activity, which included learning basic horsemanship. Subjects also participated in a post-riding processing group; here subjects shared their experiences with each other and participated in creative exercises, such as writing poetry, about the day's experience. Throughout each session, therapists provided positive feedback and encouraged the subjects to support each other; this dynamic was intended to create mastery experiences for the subjects. To assess outcome, all subjects were given

semi-structured interviews at the end of the program, which were evaluated for thematic content.

Results indicated that many of the subjects were nervous and fearful of the horses at the first session, but that they began looking forward to riding and wanted to continue riding after the program had ended (Bizub et al., 2003). According to self-report, subjects experienced increased self-efficacy for overcoming their fear and believed that this experience would help them overcome adversity in the future. They perceived that the horses provided unconditional love and they developed respect and empathy for other creatures as each horse and subject became a team. Bizub et al.'s (2003) findings provide insight into possible mechanisms of change EAP activities provide.

Similarly, Beiber (1983) integrated EAP into the Village School, which is an academic program for those who are physically handicapped, multiply handicapped, emotionally disturbed, learning disabled, and have severe communication disorders. EAP included mounted and unmounted activities aimed at increasing self-esteem, exhibiting appropriate behaviors with the horses, stimulating curiosity and awareness, developing receptive and expressive language, and enhancing emotional adjustment. Results indicated that 38 out of the 42 participants met at least four of these goals, none of the children reacted to the experience negatively, and none of the children exhibited externalizing behaviors with the horses. One of the horses died following the end of the program and student responses suggest that these severely cognitively, emotionally, and physically impaired children may have developed strong emotional bonds with the horse.

Despite these promising findings, there are considerable limitations to Bizub et al.'s (2003) and Beiber's (1983) studies, including lack of control groups and using only

qualitative data. Qualitative data is important in understanding mechanisms of change and provide valuable information regarding formulation of future hypotheses. However, qualitative data is more subject to experimenter biases and misinterpretation than quantitative approaches. Also, quantitative data may not match qualitative data. Such an example is a study by Ewing, MacDonald, Taylor, and Bowers (2007). Subjects were 36 students in a day school who were referred when they were not benefiting from existing school programs. They had diagnoses including behavior disorders, developmental disorders, ADHD, learning disorders, Post-Traumatic Stress Disorder (PTSD), depression, bipolar disorder, explosive disorder, autism, and Borderline Personality Disorder (BPD), which represented a broad spectrum of clinical concerns. Subjects participated in structured two-hour sessions with the horses twice a week for nine weeks; these sessions were designed to increase cooperation, trust, and responsibility that would generalize to other settings. Simultaneously, the subjects participated in Horse Power, which is a within-school intervention designed to increase pro-social behavior.

Ewing et al.'s (2007) qualitative results indicated that teachers, the therapeutic riding instructor, and equine volunteers all perceived positive changes in the youths, which was discussed in case studies of several participants. However, these gains were not supported quantitatively because self-esteem, interpersonal empathy, responsibility, depression, and loneliness did not change significantly from pre-test to post-test. Similarly, Tucker (1997) failed to find statistical support that EAP influenced self-concept, locus of control, impulsivity, and hopelessness in adolescents with presenting problems including conduct difficulties, sex crime offenses, suicidal gestures, and learning disabilities. There are several reasons that might account for the difference in

quantitative and qualitative results, including expectancy effects and bias effects; it is logical to assume that professionals who are committed to EAP believe that this therapeutic modality effects change and may be more likely to perceive changes that do not actually occur. The difference in results may have also been due to the high amount of variability in diagnoses and cognitive abilities within the group. It is possible that some of the subjects did experience beneficial gains, but these differences were minimized by statistics comparing means. Therefore, it is difficult to draw conclusions in support of or against EAP effectiveness in these studies.

It appears that EAP may be beneficial for treating common difficulties associated with autism. Children with autism exhibit impaired social interaction and communication so they often fail to develop typical relationships (APA, 2000). However, autistic children may be able to develop close relationships with horses during EAP and learn communication skills, such as increased eye contact, which appear to generalize to interaction with other humans (Biery, 1985). Tolson (1997) examined two autistic children using an ABA single subject design whereby the intervention was eight, one-hr EAP sessions based on NARHA guidelines. Child behaviors in a regular classroom were videotaped and coded for behavior type and frequency. Results indicated that echolalic speech decreased and other-directed behavior increased during and after the EAP intervention. In addition, problematic behavior as assessed with the Child Behavior Checklist for Ages 4-18 and the Teacher Report Form (Achenbach & Edelbrock, 1983) decreased from pre-test to post-test.

EAP has also enjoyed empirical support for decreasing mood disorder symptomatology. Fifth and sixth grade students exhibited decreased emotional symptoms

after five, one-hr weekly sessions based on EAGALA whereby students observed horses, participated in horse activities, discussed their experiences in a group format, and completed homework assignments designed to focus on feelings of accomplishment and feelings elicited by the horse interaction (Tetreault, 2006). Similarly, children with severe emotional handicaps exhibited a significant decrease in behavioral problems after involvement with the Horse Sense program than a waitlist group (Cawley et al., 1988). Horse Sense is an EAP that focuses on education about horses, interaction with horses, identifying strengths, and teaching new methods to manage weaknesses.

Mood and anxiety dysregulation is common in eating disorder symptomatology, and eating disorder etiology is hypothesized to be at least partly due to sociocultural factors regarding ideal physical appearance (see Williamson, Zucker, Martin, & Smets, 2001). Perhaps because of these relational variables and EAP's hypothesized ability to reduce negative moods, EAP has been found effective in reducing psychopathology associated with Anorexia Nervosa (Gagriela, 1997). A case study revealed that therapeutic vaulting, whereby individuals mount a moving horse on a lunge line, facilitated emotional bonds, relaxation, trust, and feelings of safety and security (Gagriela, 1997). In addition, it appeared to increase self-esteem, concentration, and frustration tolerance as well as improve body image and perception while decreasing anxiety (Gagriela, 1997).

The previous studies highlight the consideration that EAP may be more effective with specific populations. It does appear that children who have experienced physical abuse and neglect may respond significantly more favorably to EAP interventions than those without such developmental histories (Schultz, Remick-Barlow, & Robbins, 2007).

In addition, children with at least one parent with a substance abuse diagnosis appear to benefit more from EAP than children with parents who do not have substance abuse issues (Schultz et al., 2007). Therapeutic gains may also be related to the number of sessions (Schultz et al., 2007) and younger children may benefit more from EAP than older children (Cawley, Cawley & Retter, 1988; Schultz et al., 2007). Cawley et al. (1988) found that children younger than age 13 exhibited the greatest decrease in behavioral problems in children with mental retardation, learning disorders, and severe emotional handicaps.

EAP may be particularly beneficial for adolescents who exhibit a number of risk factors for mental disturbance and criminal behavior. Schultz (2005) examined EAP effectiveness with 12-18 year-old at-risk adolescents, which were defined as those who had at least three risk factors including: poverty, family discord, abuse, substance abuse, congenital defects, low birth weight, perinatal stress, divorce, parental alcoholism, more than four siblings, parental mental illness, and parents with limited education. Convenience samples of subjects who received individual or group EAP and a control group of those who were not exposed to horses were used; each group included children in inpatient and outpatient treatment. Outcome was assessed utilizing the Youth Outcome Questionnaire (Y-OQ; Burlingame, Wells, Cox, Lambert, Latkowski, & Justice, 2005) and Youth Outcome Questionnaire Self-Report (Y-OQ-SR; Wells, Burlingame, Rose, & Reisinger, 1999) after 6, 8, or 10 weeks.

Schultz's (2005) results indicated that therapists observed significantly more gains in psychosocial functioning in the EAP than in the control group. Parents observed significantly less intrapersonal distress and behavioral dysfunction and significantly

better interpersonal relationships for children in EAP compared to the control group. Subjects in EAP reported experiencing significantly less intrapersonal distress and somatic symptoms and enhanced interpersonal relationships compared to the control group. However, this study had several methodological difficulties. Despite differences in the type of risk factors in each group, these factors were not examined statistically to evaluate whether they may have had an effect on subsequent results. In addition, there were a variety of EAP treatments and control group treatments that were not adequately examined for differential effects. This study does provide preliminary support that EAP may be more beneficial for at-risk adolescents, but it is disappointing that known potential confounds were not examined.

It does appear that EAP may target specific therapeutic concerns. Trotter (2006) assigned 164 children and adolescents with various racial backgrounds to an EAP group or a control group. The EAP groups consisted of weekly two-hr EAP sessions for 12 weeks whereby students participated in horse activities, clinical processing of experiences, and a focus on how to generalize skills to other aspects of their lives. The control group was Kid's Connection, which is an empirically supported school-based guidance treatment that focuses on meeting social, academic, and personal needs; subjects met for one hour per week for 12 weeks. Outcome measures included pre-treatment and post-treatment Behavior Assessment System for Children (BASC; Achenbach, 1993) self-report, parent-report, and teacher-report forms.

Results indicated that teachers did not perceive a significant change in any areas for the EAP group, but did show a decrease in Somatization scale scores for the control group (Trotter, 2006). However, parent-report and self-report BASC scores revealed

significant differences between the pre-test and post-test in the EAP group. Specifically, parent reports indicated a significant decrease for the Behavioral Symptom Index, Externalizing Problems Composite, Internalizing Composite, Adaptive Skills Composite, Hyperactivity, Aggression, Conduct Problems, Anxiety, Depression, Somatization, Attention Problems, and Social Skills scales. The only significant difference for the control group was decreased Depression scale scores. Self-reports indicated that students in the EAP group experienced decreased Emotional Symptom Index, Clinical Maladjustment Composite, Atypicality, Sense of Inadequacy, and Relations with Parents scales. Students in the control group had significantly lower scores on the Emotion Symptom Index, Personal Adjustment Composite, Social Stress, and Self-Esteem scales. Overall, the EAP group exhibited statistically significant improvements in self-esteem, social stress, and problematic behaviors, such as aggression, hyperactivity, and conduct disturbance when compared to the control group. Trotter's (2006) findings allow for strong conclusions about EAP efficacy in that it was more beneficial than an existing empirically supported treatment option and targeted specific facets of disorders that other treatment options did not.

In addition to variability across diagnostic considerations and treatment concerns, it appears that different types of EAP vary in effectiveness. MacDonald (2004) evaluated five EAP programs using 8- to 17-year-old clients who were at-risk for developing severe emotional disorders. Results indicated that there were no statistically significant differences between any measured constructs from pre-test to post-test when all programs were evaluated together. However, two programs did attain significant differences when they were examined individually. Participants in the Jackson County 4-H Therapeutic

Program, which is based on NARHA principles, reported significant increases in self-esteem and internal locus of control as measured by Perceived Competence Scale for Adolescents (Harter, 1998), Self Esteem Index (SEI; Brown & Alexander, 1991), and Locus of Control Scale (LOC; Norwicki & Strickland, 1973). In addition, participants at Horsepower Therapeutic Learning Center, which is also based on NARHA principles, reported significantly less hostility and aggression as measured by the Aggression Questionnaire (Buss & Perry, 1992). Results of this study are surprising, given that both programs were based on the same therapy conceptualization, yet qualitatively different treatment effects were found. Although it is possible that multiple statistical analyses resulted in increased Type I error that could account for the findings, similar findings on multiple assessments and assessment scales substantiated results for both groups. Given these findings, it is important to understand how different diagnostic concerns and settings interact with EAP effectiveness and EAP types. In addition, it is important to examine whether mechanisms of change hypothesized to be active in EAP are consistent across treatment programs.

Although EAP is more commonly implemented in group and individual formats, it has also been utilized in couples therapy. Russell-Martin (2006) randomly assigned 20 heterosexual couples to either EAP couples therapy or solution-focused couples therapy. Therapeutic change was assessed using the Dyadic Adjustment Scale (DAS; Spanier, 1967), which was administered at intake and at the end of the third and sixth sessions. Results indicated that there were no significant differences between the EAP and solution focused groups at the intake or the third session; however, the EAP group exhibited significantly greater levels of relational satisfaction than the solution-focused group at the

sixth session. This study provides strong support that EAP was more effective in enhancing relationship satisfaction than an empirically supported treatment for couples therapy.

While several studies provide support for immediate results of EAP, there is less research evaluating long-term effects garnered from EAP. Klontz, et al. (2007) evaluated a 28-hour long Equine-Assisted Experiential Therapy (EAET), which combines EAP with experiential techniques, in a residential program. Results showed a significant decrease in Brief Symptom Inventory (BSI; Derogatis, 1993) Global Severity Index (GSI) and Personal Orientation Inventory (POI; Shostrom, 1974) scores from pre-test to post-test and therapeutic gains were maintained at a six-month follow-up.

Although some researchers caution against using AAT for individuals who dislike or abuse animals (e.g., Chandler, 2005; Hart, 2000), EAP does appear to decrease antisocial behavior, which is commonly associated with animal abuse. One way to operationally measure antisocial behavior is to examine aggressive behaviors. Pearson (1997) examined EAP for male children and adolescents in foster care using the critical incident report to examine antisocial behavior change. Participants engaged in EAP activities, which primarily focused on riding horses, for a variable number of sessions. Pearson (1997) found that participants exhibited significantly less physical violence toward themselves and others; this decrease was negatively correlated to the number of EAP sessions, indicating that therapeutic gains continued to rise with repeated exposure to horse activities. However, the participants exhibited significantly more oppositional behaviors and made more threats. This suggests that EAP may specifically target particular aspects of aggressive behavior.

Antisocial behaviors can also be measured by examining criminal behaviors. The Bureau of Land Management (BLM) developed the Wild Horse and Burro Program (WHBP) with NOWAH whereby excess feral horses and burros are captured and trained by inmates in facilities around the United States (BLM, 2008). The first program was established in 1988 at the Wyoming State Honor Farm and includes approximately 25 inmates and up to 200 feral horses at any time in the current program (Laughlin, 2008). Since the Wyoming State Honor Farm program inception, WHBP training facilities have been established in Colorado, Kansas, and Nevada (BLM, 2008). After feral horses and burros are trained, private individuals adopt them during regularly scheduled adoption drives.

It appears that WHBP can facilitate community involvement in correctional centers and decrease negative prejudice against individuals who are convicted (Crawford, Jackie, Skolnik, & Howard, 2002). This translates into decreased negative publicity and increased communication between correctional centers and the community. Positive relationships may also be fostered between inmates and correctional officers, as is indicated by the collaborative effort of Colorado Department of Corrections and U. S. Border Patrol to equip Border Patrol agents with horses trained by inmates (Endersby, 2007). In addition, WHBP offers skill-building opportunities whereby convicted individuals gain valuable occupational skills that make them more likely to find gainful employment after release (Crawford et al., 2002; CSC, 1998). Moreover, research suggests that WHBP was associated with reduced disciplinary problems and violent offenders appeared to benefit significantly more than non-violent offenders (Cushing et al., 1995). However, the full effects of WHBP have not been adequately evaluated using

empirical methods, so it is difficult to make strong conclusions about the benefits of using horse training for rehabilitative purposes in forensic settings.

In summary, research suggests that EAP may be effective for treating a variety of mental disorders and psychosocial clinical concerns with clients from a wide age range. The applicability of EAP to multiple diagnoses and treatment concerns does not seem surprising, given the breadth of hypothesized mechanisms of change. However, no study has explicitly sought to understand whether the underlying theoretical conceptualizations behind EAP are actually operating. Most studies demonstrating changes in these constructs examined them post-hoc or by using qualitative designs. This is surprising and disappointing, given the importance of demonstrating how or why EAP may produce beneficial treatment gains. It is likely that research in this area is deficient partially due to its relative infancy in empirical documentation as well as due to the lack of a comprehensive model to standardize hypothesized mechanisms of change across programs and treatment types. Because of this gap in the research, it would be highly beneficial and important to put forth a comprehensive theoretical framework for mechanisms of change and evaluate it using A priori hypotheses. A thorough evaluation of mechanisms of change may also provide information that might account for conflicting findings in the research.

Tri-Level Mechanisms of Change (TLMC) Conceptualization

By combining theoretical conceptualizations for AAT in general and EAP more specifically, research suggests several hypothesized mechanisms of change that may produce therapeutic gains. This study proposes a hierarchical tri-level model, which

parsimoniously incorporates all available theoretical conceptualizations for AAT and EAP (see Figure 1).

The primary level consists of the developing HAB consistent with the biophilia and social support hypotheses. At this level, clients are biologically drawn toward interactions with animals and receive social reinforcement in their interactions. Through repeated exposure to therapy animals, clients' HABs with these therapy animals become stronger and more resilient. As attachment grows, clients become more able to process deeper mechanisms of change in the secondary level. People who already have strong HABs with their own animals may be more likely to quickly form a strong, positive relationship with therapy animals (Hart, 2000). Therefore, HAB with personal pets is hypothesized to interact with the developing HAB with therapy animals in the primary level.

In the secondary level, clients' interaction with, and care for, animals provide learning and modeling opportunities that produce cognitive and behavioral change in constructs more general to psychological well being. Research and theoretical conceptualizations identify several areas that are included in the secondary level. These constructs include:

Coping Mechanism Development

Often, clients' emotional experiences are intense for a small subset of emotions and constricted in other emotional areas. Animals can generate a wide range of pleasant and unpleasant emotions (McCormick & McCormick, 1997); this may be particularly true for horses because of their distinct personalities and moods (Irwin & Weber, 2001). Elicited emotion in the safety of the HAB provides opportunities for clients to experience

and cope with emotions (Marx & Cumella, 2003). In addition, therapeutic techniques focused on allowing clients to observe how excessive or constricted emotion impacts animal behavior provide experiential opportunities for emotional correction (Fine, 2000b).

Self-Knowledge/Self-Concept

Animals provide understanding about life qualities, such as biological functioning (Melson, 2003; Myers, 1998), which may allow children to learn about themselves and their own biology (Myers, 1998). Clients are able to solidify their self-concept in comparison to the horse (O'Connor, 2006) and learn to understand their drives and needs through observing instinctive and uncensored animal behavior (McCormick & McCormick, 1997). When horses mirror client behavior, clients may attain greater insight into their own actions (Marx & Cumella, 2003; McCormick & McCormick, 1997).

When entering new situations, particularly with horses, many clients have concerns about embarrassing themselves. By working through this anxiety, clients develop self-acceptance (Marx & Cumella, 2003). Animals may also assist clients to understand bereavement (Stewart, 1983) and how loss impacts their own self-concept. Similarly, it may foster resiliency for an integrated and positive self-concept when difficult situations arise.

Self-Efficacy

When clients are able to employ new skills with an impending animal, they attain mastery experiences, which enhance self-efficacy (Marx & Cumella, 2003). By working through fears and anxieties associated with animal interactions, clients are encouraged to engage in novel situations in other settings and are able to tackle challenges in the future

(Bizub et al., 2003; Marx & Cumella, 2003). When clients observe that they can have a direct impact on another creature they learn that they can exert control over their environment (McCormick & McCormick, 1997; McDonald, 2004). This empowerment results in an increased internal locus of control whereby clients generalize skills into other settings and behave in ways to positively shape their environments rather than accept undesirable situations.

Self-Esteem

Self-esteem is one of the more researched constructs in the secondary level, and several studies have demonstrated increases in self-esteem after participating in AAT (e.g., Gagliola, 1997; MacDonald, 2004; Strimple, 2003; Trotter, 2006). However, studies examining self-esteem utilized it as an outcome measure. General research on self-esteem suggests that self-esteem is a general correlate of adequate psychological functioning for a variety of treatment concerns (e.g., Karatzias, Chouliara, Power & Swanson, 2006), which suggests it is more likely a secondary mechanism of change rather than an outcome variable. Animals typically behave in fashions that suggest they find human attention rewarding (Hart, 2000; Pichot & Coulter, 2007) and allow clients to perceive their own characteristics within the animal. These experiences may validate client experiences and can result in increased self-esteem.

Empathy

After clients become attached to a therapy animal through the HAB, they are more likely to provide care for the animal. When clients perceive unconditional love from animals, they develop respect and empathy for other creatures (Bizub et al., 2003). By learning to provide basic care for an animal that depends on human attention and nurture

for survival, clients may be more sensitive to needs of that animal (McCormick & McCormick, 1997), which generalizes to other humans (Myers, 1998). In addition, therapeutic techniques focused on inferring and reflecting relationship patterns conveys empathy for the client's perspective, which serves as a modeling opportunity and validation (Chandler, 2005).

Interpersonal Skills Acquisition

Horse socialization in the herd is similar to human socialization (McCormick & McCormick, 1997), and all animals interact primarily through non-verbal communication (Marx & Cumella, 2003). Horses also provide honest feedback about communication through their responses to client behavior (Marx & Cumella, 2003). By observing animal-animal, animal-therapist, and animal-self communication patterns, clients learn to attend to and accurately interpret non-verbal communication and monitor and correct their own body language (Marx & Cumella, 2003). They also learn about appropriate boundary setting (Marx & Cumella, 2003), perspective taking, and conflict resolution (McCormick & McCormick, 1997).

Clients may be more able to trust animals because they do not differentially respond to humans based on physical appearance or status (Chandler, 2005; Hart, 2000; Pichot & Coulter, 2007). In addition, clients are able to observe loving relationships between animals and therapists, which provide modeling opportunities to learn appropriate trust and social support seeking skills (Fine, 2000b). Through direct and indirect exposure to animals, clients may learn to trust a creature that has the potential to cause harm to themselves, and clients may be more able to work through relationship issues and learn to trust others (Marx & Cumella, 2003; O'Connor, 2006).

Adaptive changes in hypothesized mechanisms of change at the secondary level give rise to reduction in psychopathology. The tertiary level is comprised of mental illness diagnoses and symptoms that are considered the primary treatment targets. Research has demonstrated that AAT and EAP may alleviate mental illness diagnoses including anxiety disorders (e.g., Barker & Dawson, 1998; Hansen et al., 1999), mood disorders (e.g., Antonioli & Reveley; Cawley et al., 1988; Colombo et al., 2006; Souter & Miller, 2007); anorexia nervosa (e.g., Gagliola, 1997), ADHD (e.g. Fine, 1992; Katcher & Wilkins 1999, 2000), learning disorders (e.g., Fine, 1992), schizophrenia (e.g., Bizub et al., 2003; Kovacs et al., 2006; LaFrance et al., 2007; Thompson et al., 1983), and autism (e.g., Biery, 1985; Tolson, 1997). Given the nature of the hypothesized mechanisms of change at the secondary level, it is reasonable to expect additional decreases in heterogeneous psychopathology at the tertiary level.

Current Study

Although research suggests that EAP may be effective for treating a range of disorders, it is important to both replicate and enhance these findings. In addition, it is important to understand the hypothesized mechanisms of change that are suggested by AAT and EAP conceptualizations. Therefore, this study seeks to examine the TLMC conceptualization, which will accomplish both tasks. Participants were drawn from child and adolescent clients at three independent EAP facilities in Colorado: Medicine Horse Program, Hearts & Horses, and Gateways to Transformation's Phoenix Rising Program.

Medicine Horse Program is a nationally recognized EAP facility located in Boulder that is dedicated to enhancing quality of life through equine-assisted experiences. It provides group, individual, and family sessions that focus on healing for low-income

individuals and vulnerable populations. MH has three core programs that participated in the research, including HopeFoal Project, Equus Integration, and Just Say Whoa.

The HopeFoal Project is a group program that pairs at-risk youth with Premarin foals, which are foals born of mares used to collect pregnant mare urine (PMU) utilized in hormone replacement therapy drugs. Clients consist of male and female children and adolescents who are referred for treatment for anxiety, depression, anorexia nervosa, and suicidal ideation. Clients complete eight, one-hr weekly semi-structured sessions that focus on emotional regulation, body awareness, building trust in relationships, and sensory and cognitive integration. This is accomplished through equine activities designed to increase empathy (e.g., placing emotion stickers on the horse where it might feel an emotion), appropriate emotional expression (e.g., telling the horse personal stories), healthy boundaries (e.g., herd observation), and social skills (e.g., observing how horses communicate their feelings, needs, and wants).

Equus Integration is a group program that serves diverse racial populations from Boulder County. Clients range in age from 12-18 years old, and are referred from the Newcomer Pathways Program. Clients do not necessarily meet DSM-IV-TR diagnostic criteria, but are experiencing difficulties with acculturation and conflict due to racial issues. Clients participate in three, one-hr semi-structured sessions focused on decreasing barriers and easing conflict due to differences in language and culture. This is accomplished through equine activities designed to increase leadership (e.g., leading a horse through an obstacle course), tolerance of differences (e.g., discussing different colors and breeds of horses), and create healthy boundaries (e.g., recognizing how horses maintain boundaries).

Just Say Whoa serves teens who are repeat juvenile offenders or display problematic behaviors including truancy, substance abuse, and anger management problems. Clients range in age from 12-18 years old and are referred through the Boulder Enhanced Supervision Team. Clients participate in 16, one-hr weekly group structured sessions that focus on developing communication skills, appropriate boundaries, emotional identification and expression, assertiveness, and empathy toward others and themselves. This is accomplished through equine activities designed to increase self-awareness (e.g., noticing emotions that are present around the horses), caring for others (e.g., learning how to feed horses and clean stalls), knowledge of group dynamics (e.g., watching the herd), and teamwork (e.g., herding a horse into the corner of a paddock as a team).

Hearts & Horses is a North American Riding for the Handicapped Association (NARHA) Premier accredited center devoted to promoting the physical, cognitive, emotional, and social well-being of individuals with special needs and mental health concerns. Clients from the Changing Leads program were included in this study. Clients range in age from 12-18 and participate in eight, 90-minute weekly structured group sessions. Changing Leads was based on how horses are in total balance when they are in the correct lead while loping, it and encourages clients to “change their lead” in order to balance the weight of stressors in their lives. It accomplishes this through equine activities designed to increase empathy (e.g., learning to care for horses), understand non-verbal communication (e.g., giving horses massages), facilitate body freedom (e.g., basic stretches and Pilates while on the horse), and increase problem-solving (e.g., creating obstacles and leading horses through them).

Gateways to Transformation's Phoenix Rising Program is an Equine Assisted Growth and Learning Association (EAGALA) certified organization located in Longmont, CO. It offers personal development through EAP activities in group, workshop, and individual therapy formats. Phoenix Rising utilizes experiential activities to enhance pre-existing individual strengths while challenging clients to discover new strategies for relating to, and coping with, personal struggles. Participants from Phoenix Rising participate in eight, one-hr semi-structured individual sessions designed to create boundaries (e.g., meeting the herd), increase problem-solving (e.g., catching and haltering a horse), and increase assertiveness (e.g., longing a horse).

Because mechanisms of change are hypothesized to occur regardless of the population or treatment focus, all groups and treatment types were examined together in initial analyses. However, given prior research findings that EAP effectiveness can vary across programs (MacDonald, 2004), differences in treatment gains between facilities and treatment modalities were also examined. Participants completed self-report questionnaires designed to measure constructs put forth in TLMC at intake, immediately following discharge, and four weeks following discharge to examine whether treatment gains persist.

Based on TLMC, this study proposes the following hypotheses.

1. Participants will experience treatment gains in secondary level constructs (coping, self-concept, self-efficacy, self-esteem, empathy for others, and interpersonal difficulties) and tertiary level constructs (somatic symptoms, interpersonal relations, intrapersonal distress, social problems, behavioral

dysfunction, critical items, and aggregate symptom index) as a result of participating in EAP.

2. The degree of attachment to the therapy horses at the end of treatment will account for a significant amount of improvement for secondary level constructs between prior to starting treatment and at the end of treatment.
3. Pre-existing HAB with other animals prior to entering therapy may moderate EAP intervention success. Higher levels of pre-existing animal affinity is predicted to be related to the development of stronger HAB with therapy horses, which would result in increased changes in secondary constructs.
4. The degree of change in the secondary level constructs (coping, self-concept, self-efficacy, self-esteem, empathy for others, and interpersonal difficulties) will predict changes in the tertiary level constructs (somatic symptoms, interpersonal relations, intrapersonal distress, social problems, behavioral dysfunction, critical items, and aggregate symptom index).
5. Treatment gains in the secondary level constructs (coping, self-concept, self-efficacy, self-esteem, empathy for others, and interpersonal difficulties) and tertiary level constructs (somatic symptoms, interpersonal relations, intrapersonal distress, social problems, behavioral dysfunction, critical items, and aggregate symptom index) at the end of treatment will persist during the four-week follow-up period.

CHAPTER II

METHODS

Participants

Overall, EAP and AAT studies that report effect sizes suggest that EAP may have a moderate effect size for decreasing psychopathology. Using G-Power for A priori power analysis, a moderate effect size ($r = 0.3$) would require 111 subjects for correlational statistics ($p = 0.95; \alpha = 0.05$). For multiple regression statistics, a moderate effect size ($f^2 = 0.15$) would require 172 subjects ($p = 0.95; \alpha = 0.05$). For within-subjects t -tests, a moderate effect size ($d = 0.50$) would require 176 subjects ($p = 0.95; \alpha = 0.05$).

However, a sample size of this magnitude was not attainable at this point in time, given the time constraints of the study. In addition, EAP mechanisms of change should be robust in order to justify using horses for therapeutic purposes. Prior research suggests that AAT gains are due to interactions with animals rather than as a result of only interaction with other humans who are present with the animals (Banks & Banks, 2005). However, AAT is often incorporated into other theoretical perspectives (e.g., Chandler, 2005; Fine, 2000b; Klontz et al., 2007; Pichot & Coulter, 2007; Russell-Martin, 2006) with a focus on using the HAB to facilitate therapist-client relationships (Chandler, 2005; Mallon, 1992). EAP is hypothesized to be no different in these aspects than general AAT with other animals. It is important to demonstrate that therapy horses and HABs with therapy horses are vital components in EAP and that treatment gains are not due to

therapeutic techniques associated with traditional talk therapy only. As was previously discussed, horses also require a substantial amount of time and financial commitment to appropriately care for and house them. In addition, there is an increased potential for accidental physical injury as a result of interacting with therapy horses when compared to more traditional forms of talk therapy that do not incorporate animals. Given these concerns, EAP mechanisms of change should demonstrate a large effect size in order to be considered valid and justify using horses for therapeutic purposes. Therefore, a sample size of 45 participants should be adequate to detect these effects.

Procedure

Clients were offered an opportunity to participate in this study when they completed intake procedures at Medicine Horse Program, Hearts & Horses, or Phoenix Rising Program. Data were collected between 07/01/09 and 4/25/2011. Once client and legal guardian consent was obtained through the informed consent form (see Appendix A) and HIPPA Authorization form (See Appendix B), participants completed a demographic questionnaire (see Appendix C) and the following self-report questionnaires to assess primary level constructs and secondary level constructs. Questionnaires were randomly ordered to eliminate order effects.

Miller-Rada Commitment to Pets Scale (MRCPS; Saats, Miller, Carnot, Rada, & Turnes, 1996): The MRCPS includes two separate scales to distinguish between commitment to pets (COM) and attachments to pets (ATT). The COM scale consists of 10 items designed to assess an individual's resolve to keep a pet in spite of challenges, and the ATT scale consists of 12 items designed to assess the strength of attachment with personal pets. The MRCPS demonstrates high internal reliability (COM $\alpha = 0.90$; ATA

$\alpha = 0.89$) and high construct validity (positive correlations with existing measures).

Results indicate that COM and ATT are distinct constructs that are both important in pet satisfaction and HAB. The MRCPS will be utilized to assess existing HAB with personal pets in this study.

Lexington Attachment to Pets Scale (LAPS; Johnson, Garrity, & Stallones, 1992) revised for therapy horses: The LAPS is a 23-item questionnaire designed to measure the intensity of the HAB between people and their pets. Conceptualizations of the HAB do not differentiate between HAB between people and their pets and the HAB between clients and their therapy animals. Both forms of HAB are thought to be essentially the same construct. Because no measure currently exists to measure the HAB strictly for client-therapy animals, the LAPS was revised to measure participants' HABs with therapy horses. The revision consisted of modifying the instructions from, "Please answer these questions thinking about your pet" to "Please answer these questions thinking about the horses at your Equine Assisted Psychotherapy program." In addition, the existing wording of "my pet" in the items was replaced with "the horse." For example, "I love my pet because it never judges me," was reworded to, "I love the horse because it never judges me." It is unlikely that this modification will impact the psychometric qualities of the LAPS. The LAPS demonstrates excellent internal reliability ($\alpha = 0.928$) and good construct validity (all items appear to represent some level of attachment to a companion animal and correlate with interview ratings.) The LAPS will be utilized to assess the strength of HAB between participants and therapy horses in this study.

Adolescent Coping Orientation for Problem Experiences (A-COPE; Patterson & McCubbin, 1991): The A-COPE is a 54-item assessment designed to measure behaviors

adolescents use to cope with difficult situations. It includes 12 factors of coping, but the overall score can be utilized as a general indicator of overall coping ability. Therefore, this study will utilize the aggregate score. The A-COPE has good internal consistency (subscale α 's range from 0.50 to 0.75), reliability ($\alpha = 0.82$), and test-retest reliability ($r = 0.83$).

Beck Youth Inventories Self-Concept Scale, Second Edition (BYI; Beck, Beck, & Jolly, 2005): BYI consists of five self-report inventories each with 20 questions designed to assess emotional and social impairment for children and adolescents aged 7-18 years old. Only the Self-Concept Inventory (SC), which examines feelings of competence, potency, and positive self-worth, will be utilized in this study. BYI scales demonstrate adequate internal consistency (Chronbach's Alphas range from 0.86 to 0.96), internal reliability (SEM = 2.00 to 3.39), test-retest reliability ($r = 0.74$ to 0.93), and validity (significant correlations with other similar instruments).

General Self Efficacy Scale (GSES; Schwarzer & Jerusalem, 1995): The GSES is a 10-item questionnaire designed to measure to what degree individuals believe they can cope with obstacles and respond to difficult situations. The GSES demonstrates high internal reliability ($\alpha = 0.82$ to 0.93), test-retest reliability ($\alpha = 0.47$ to 0.63), predictive validity ($r = 0.40$ and 0.56 for women after one year), and concurrent validity (positive correlations ranging from $r = 0.40$ to 0.52 with similar measures and negative correlations from $r = -0.28$ to -0.42 with unrelated constructs).

Hare Self-Esteem Scale (HSES; Hare, 1985): The HSES is a 30-item questionnaire that measures self-esteem of children and adolescents 10 years old and above in three area-specific domains, including peer relationships, school, and home. The

sum of all three scores is considered a general self-esteem measure, and the aggregate score will be used in this study. The HSES demonstrates adequate test-retest reliability ($r = 0.56$ to 0.74), and concurrent validity ($r = 0.83$ with Coopersmith Self-Esteem Inventory and Rosenberg Self-Esteem Scale).

Index of Empathy for Children and Adolescents (IECA; Bryant, 1982): The IECA is a 22-item questionnaire designed to measure empathic response in children and adolescents. The IECA demonstrates good test-retest reliability ($r = 0.74$ to 0.85) and convergent and divergent validity (adequate correlations with Feshbach and Roe and non-significant correlations with measures unrelated to empathy).

Questionnaire about Interpersonal Difficulties for Adolescents (QIDA; Inglés, Méndez, & Hidalgo, 2000): The QIDA is a 40-item questionnaire designed to measure interpersonal difficulties for adolescents. Although it was initially evaluated in Spanish, several translations have been utilized with adequate reliability and validity. This measure was selected because other available self-report measures of interpersonal difficulties measured social anxiety, which is thought to be different from interpersonal difficulties in general. The QIDA demonstrates adequate internal consistency for each of the subscales, which are overall score ($\alpha = 0.90$), assertiveness ($\alpha = 0.83$), heterosexual relationships ($\alpha = 0.85$), public speaking ($\alpha = 0.75$), family relationships ($\alpha = 0.67$), and close friendships ($\alpha = 0.57$). In addition, it demonstrates adequate test-retest reliability ($r = 0.53$ to 0.79), and convergent validity (adequate correlations with other measures of interpersonal difficulty). Because the aggregate score reflects overall interpersonal difficulties, this score will be utilized in the study.

To measure tertiary level constructs, participants' legal guardians completed the *Youth Outcome Questionnaire, parent report form* (Y-OQ; Burlingame, Wells, & Lambert, 1996). The Y-OQ is a 64-item parent or therapist report measure (Burlingame, Wells, Cox, Lambert, Latkowski, & Justice, 2005). It is conceptualized as an extension of the Outcome Questionnaire (OQ-45; Lambert, Huefner, & Reisinger, 1996) that is appropriate for children and adolescents (Wells, Burlingame, Lambert, Hoag, & Hope, 1996).

The Y-OQ was developed by individuals from clinical practice, managed care, and research perspectives to track therapy effectiveness as it is utilized in typical "real-world" settings (Burlingame, Mosier, Weels, Atkin, Lambert, Whoolery, & Latkowski, 2001, p. 362). The Y-OQ is designed to provide a simple and cost effective method to substantiate client change and demonstrate this progress for managed care companies (Burlingame et al., 2001). This measurement tool assesses therapy outcomes across a variety of settings, populations, and therapy types (Burlingame et al., 2001).

Seven scales were designed to reflect areas of functioning indicating actual change (Wells et al., 1996) that literature demonstrates are modified by diverse treatment programs (Burlingame et al., 2001). This was accomplished through focus groups of past inpatient and outpatient populations, examination of patient records, and a child outcome literature review (Wells et al., 1996). Somatic (SOM) assesses physiological discomfort such as headaches, dizziness, gastrointestinal difficulties, and pain (Burlingame et al., 2005). Interpersonal Relations (INTER) assesses relationship quality with parents, other adults, and peers through understanding attitudes toward others, communication patterns, and aggressive and cooperative behaviors (Burlingame et al., 2005). Intrapersonal

Distress (INTRA) assesses emotional distress and its typical manifestations of depression, anxiety, fearfulness, hopelessness, and self-harm ideation. Social Problems (SOC) assesses behavior problems in social contexts including delinquent behaviors, aggression, truancy, sexual misconduct, and running away (Burlingame et al., 2005). Behavioral Dysfunction (BEH) assesses symptoms associated with ADHD, such as hyperactivity, inattention, and impulsivity (Burlingame et al., 2005). Critical Items (CRIT) assesses severe symptoms commonly found in inpatient settings, such as paranoia, obsessive-compulsive behavior patterns, hallucinations, mania, delusions, and disordered eating behavior (Burlingame et al., 2005). The total score (TOTAL) is an aggregate score of all subscales and represents overall functioning (Burlingame et al., 2005).

Burlingame et al. (2001) conducted four studies using eight samples of diagnostically normal, outpatient, and inpatient child and adolescent populations. Results revealed that the Y-OQ exhibited adequate internal reliability as was indicated with a total Cronbach coefficient $\alpha = 0.94$. The Y-OQ also appears to be stable over time because test-retest reliability at two and four-week intervals revealed an average Cronbach coefficient alpha of 0.83; subscale Cronbach coefficient alphas ranged from 0.56 for CRIT to 0.82 for BEH. The Y-OQ also demonstrated adequate criterion validity as compared to the Child Behavior Checklist (CBCL; Achenbach, 1991) and Conners' Parent Rating Scale-93 item version (CPRS-93; Conners, 1990), which are both reliable and valid measures of psychopathology. Y-OQ subscales were compared to CBCL and CPRS-93 subscales hypothesized to measure similar constructs; all correlations were significant and correlation coefficients ranged from 0.39 to 0.78, which indicate that the

Y-OQ exhibits adequate criterion validity as compared to existing measures of psychopathology. In addition, the Y-OQ appears to have adequate construct validity. Scores were able to discriminate whether a client was from the normal population or was receiving private inpatient care, community mental health care, or private outpatient care. Finally, changes in Y-OQ scores demonstrated that the measure is sensitive to change because reliable change indices indicate it was able to detect changes over a short period of time.

Because the Y-OQ is not associated with any particular diagnostic category or therapeutic conceptualization, it is a satisfactory assessment tool to examine children's and adolescents' overall psychological functioning. In addition, it demonstrates adequate validity and reliability and is able to measure small changes over a short period of time. Therefore, the Y-OQ appears to be a sensitive and accurate reflection of current symptomatology.

Participants and their legal guardians completed these measures prior to starting treatment and again immediately following discharge from their EAP programs. Four weeks following discharge, the same self-report questionnaires were mailed to participants and legal guardians with an instructional letter (see Appendix D) and a postage-paid addressed envelope so participants and their legal guardians could complete and return the questionnaires.

Methodological Design

A Bonferroni adjustment was calculated because type II error increases with multiple statistical analyses. A full Bonferroni adjustment would result in requiring $\alpha <$

0.0001 in order to indicate statistical significance. Because statistical analyses rarely meet this criteria, this study will utilize an adjusted $\alpha \leq 0.01$ to indicate statistical significance.

Hypothesis 1 is that participants will experience treatment gains in secondary and tertiary constructs as a result of participating in EAP. In order for Hypothesis 1 to be supported, there will be a significant increase between pre-test and post-test scores for A-COPE, BYI-SC, HSES, GSES, and IECA, as assessed with paired samples *t*-tests. There will also be a significant decrease between pre-test and post-test scores for QIDA and all Y-OQ subscales (SOM, INTER, INTRA, SOC, BEH, CRIT, and TOTAL), as assessed with paired samples *t*-tests.

Hypothesis 2 is that the degree of attachment to the therapy horses at post-test will account for a significant amount of improvement between pre-test and post-test for secondary level constructs. To test this, a series of repeated measures ANOVAs will be utilized with post-test LAPS scores as a between-subjects factor. Pre-test and post-test scores for A-COPE, BYI-SC, HSES, GSES, IECA, and QIDA will be entered as within-subjects factors. In order for hypothesis 2 to be supported, post-test LAPS scores will account for a significant amount of variance in the change between pre-test and post-test scores for each of the secondary level measures.

Hypothesis 3 is that pre-existing HAB with other animals prior to entering therapy may moderate EAP intervention success. Higher levels of pre-existing animal affinity is predicted to be related to the development of stronger HAB with therapy horses, which would result in increased changes in secondary constructs. To test this, the relationship between MRCPS COM, MRCPS ATT, and LAPS will be examined using Pearson Correlation for Linear Regression. In addition, MRCPS COM and MRCPS ATT scores

will be entered as covariates into the above-mentioned repeated measures ANOVAs using LAPS scores as the between-subject variable and A-COPE, BYI-SC, HSES, GSES, IECA, and QIDA as within-subjects variables. In order for hypothesis 3 to be supported, MRCPS COM and MRCPS ATT would be significantly correlated with LAPS. Also, MRCPS COM and MRCPS ATT would account for a significant amount of the variation in the relationship between LAPS and the change from intake to discharge in secondary and tertiary construct measures.

Hypothesis 4 is that the degree of change in the secondary level constructs will predict changes in the tertiary level constructs. The difference in scores from intake to discharge on questionnaires measuring secondary level constructs (IECA, BYI-SC, A-COPE, GSES, HSES, and QIDA) will be entered as independent variables into a series of multiple regressions. These multiple regressions will utilize differences in scores from intake to discharge on the Y-OQ, which measure the tertiary level, as dependent variables. In order for hypothesis 4 to be supported, all secondary level constructs will obtain significant coefficients to predict scores on the Y-OQ scales.

Hypothesis 5 is that treatment gains in the secondary and tertiary level will persist during the four-week follow-up period as indicated by no significant change in questionnaire scores from discharge to follow-up. Scores on measures for secondary level constructs (and A-COPE, BYI-SC, HSES, GSES, IECA, and QIDA) and the tertiary level construct (Y-OQ subscales) from discharge and four weeks following discharge will be compared utilizing a series of within-subject *t*-tests. In order for hypothesis 5 to be confirmed, all *t*-tests should be non-significant.

will be entered as covariates into the above-mentioned repeated measures ANOVAs using LAPS scores as the between-subject variable and A-COPE, BYI-SC, HSES, GSES, IECA, and QIDA as within-subjects variables. In order for hypothesis 3 to be supported, MRCPS COM and MRCPS ATT would be significantly correlated with LAPS. Also, MRCPS COM and MRCPS ATT would account for a significant amount of the variation in the relationship between LAPS and the change from intake to discharge in secondary and tertiary construct measures.

Hypothesis 4 is that the degree of change in the secondary level constructs will predict changes in the tertiary level constructs. The difference in scores from intake to discharge on questionnaires measuring secondary level constructs (IECA, BYI-SC, A-COPE, GSES, HSES, and QIDA) will be entered as independent variables into a series of multiple regressions. These multiple regressions will utilize differences in scores from intake to discharge on the Y-OQ, which measure the tertiary level, as dependent variables. In order for hypothesis 4 to be supported, all secondary level constructs will obtain significant coefficients to predict scores on the Y-OQ scales.

Hypothesis 5 is that treatment gains in the secondary and tertiary level will persist during the four-week follow-up period as indicated by no significant change in questionnaire scores from discharge to follow-up. Scores on measures for secondary level constructs (and A-COPE, BYI-SC, HSES, GSES, IECA, and QIDA) and the tertiary level construct (Y-OQ subscales) from discharge and four weeks following discharge will be compared utilizing a series of within-subject *t*-tests. In order for hypothesis 5 to be confirmed, all *t*-tests should be non-significant.

CHAPTER III

RESULTS

The sample consisted of 67 total participants; however, 22 participants did not complete post-testing and were excluded from the final statistical analysis. No participant withdrew from any of the EAP programs. This resulted in a final sample size of 45 participants (20 males, 25 females) in this study ranging in age from five to 18 years old. Of these participants, 26 were Caucasian (57.80%) and 15 were Hispanic (33.30%). The remaining four participants identified multiple ethnicities (8.90%). Two participants listed Caucasian, African American, and Native American; one participant listed Caucasian and Hispanic American; and one participant listed Caucasian and African American.

The majority of the participants ($N = 38$, 84.40%) owned pets. Six participants owned cats only (13.30%), seven owned dogs only (15.60%), two owned birds only (4.40%), one owned rodents only (2.20%), and 22 owned multiple types of pets (48.90%). Only seven participants did not own a pet (15.60%). The majority of participants had not participated in any form of EAP before ($N = 28$, 62.20%) and were not receiving any other form of mental health treatment (e.g. psychiatric medication) during participation in this study ($N = 35$, 77.8%). All participants who were receiving additional mental health treatment at the same time indicated that they began treatment prior to the pre-test.

Participants were drawn from three EAP programs in Colorado. Of the 29 children from Medicine Horse, 13 participated in Just Say Whoa, 13 participated in HopeFcal, two participated in Equus Integration, and one participated in individual therapy. There were 15 participants from Hearts & Horses, who all participated in Changing Leads. Phoenix Rising only tested one participant, who participated in individual therapy.

An adjusted $\alpha \leq 0.01$ was utilized to indicate statistical significance for all statistical computations.

When comparing those who were included (I) in the final sample and those who were not (N), I was significantly older ($M = 14.13$, $SD = 3.21$) than N ($M = 11.86$, $SD = 1.08$), $t = -3.22$, $DF = 65$, $p = 0.00$. There were no significant differences between I and N on pre-test scores for the primary level construct measure, LAPS ($t = -1.09$, $DF = 65$, $p = 0.28$). There were no significant differences between I and N on pre-test scores for measures examining pre-existing commitment to personal pets, MRCPS COM ($t = -2.07$, $DF = 65$, $p = 0.04$) or pre-existing attachment to personal pets, MRCPS ATT ($t = 1.13$, $DF = 65$, $p = 0.127$). There were no significant differences between I and N on pre-test scores for the secondary level construct measures, ACOPE ($t = 2.27$, $DF = 65$, $p = 0.03$), BYI-SC ($t = -2.41$, $DF = 65$, $p = 0.02$), GSES ($t = -1.30$, $DF = 65$, $p = 0.20$), HSES ($t = -2.15$, $DF = 65$, $p = 0.04$), IECA ($t = -0.86$, $DF = 65$, $p = 0.39$), or QIDA ($t = 2.24$, $DF = 65$, $p = 0.03$).

There were significant differences between I and N on pre-test scores for tertiary level construct measures. I ($M = 11.01$, $SD = 5.51$) obtained significantly higher scores on SOM than N ($M = 7.00$, $SD = 5.02$), $F = 8.51$, $DF = 1$, $p = 0.01$. I ($M = 5.56$, $SD =$

5.03) obtained significantly higher scores on SOC than N ($M = 2.36, SD = 4.12$), $F = 6.67, DF = 1, p = 0.01$. I ($M = 16.73, SD = 9.78$) also obtained significantly higher scores on BEH than N ($M = 10.18, SD = 6.68$), $F = 8.02, DF = 1, p = 0.01$. There were no significant differences between pre-test scores for the remaining tertiary level construct measures, INTRA ($F = 1.84, DF = 1, p = 0.18$), INTER ($F = 3.31, DF = 1, p = 0.07$), CRIT ($F = 1.20, DF = 1, p = 0.28$), or TOTAL ($F = 5.24, DF = 1, p = 0.03$).

Only three participants completed the four week follow-up questionnaires. All of these participants were females from the HopeFoal program. They were aged 10, 15, and 16 years old. Two were Caucasian and one was Hispanic. One had a dog for a pet and two had multiple types of pets.

Hypothesis 1

Hypothesis 1 was that participants would experience treatment gains in secondary and tertiary constructs as a result of participating in EAP.

Changes in secondary and tertiary constructs were assessed with a series of paired samples *t*-tests. There were no significant differences between pre-test and post-test scores for ACOPE ($t = -2.07, DF = 44, p = 0.05$), BYI-SC ($t = -0.84, DF = 44, p = 0.41$), GSES ($t = -1.51, DF = 44, p = 0.14$), HSES ($t = -1.14, DF = 44, p = 0.26$), IECA ($t = -0.70, DF = 44, p = 0.49$), or QIDA ($t = 1.03, DF = 44, p = 0.41$).

Pre-test means for secondary level measures were as follows: ACOPE ($M = 171.31, SD = 21.66$), BYI-SC ($M = 47.73, SD = 9.96$), GSES ($M = 29.16, SD = 5.69$), HSES ($M = 85.82, SD = 11.43$), IECA ($M = 134.04, SD = 22.64$), QIDA ($M = 72.02, SD = 24.74$).

Post-test means for secondary level measures were as follows: ACOPE ($M = 178.22$, $SD = 24.08$), BY1-SC ($M = 48.69$, $SD = 11.45$), GSES ($M = 30.82$, $SD = 5.91$), HSES ($M = 87.73$, $SD = 11.96$), IECA ($M = 135.91$, $SD = 22.40$), QIDA ($M = 63.51$, $SD = 20.82$).

When examining tertiary level scale scores, there were several significant differences between pre-test and post-test scores. SOM pre-test scores ($M = 11.07$, $SD = 5.51$) were significantly higher than post-test scores ($M = 8.24$, $SD = 7.02$), $t = 2.81$, $DF = 44$, $p = 0.01$. INTRA pre-test scores ($M = 15.42$, $SD = 9.09$) were significantly higher than post-test scores ($M = 12.09$, $SD = 8.81$), $t = 2.55$, $DF = 44$, $p = 0.01$. INTER pre-test scores ($M = 7.31$, $SD = 7.44$) were significantly higher than post-test scores ($M = 4.53$, $SD = 6.49$), $t = 2.89$, $DF = 44$, $p = 0.01$. SOC pre-test scores ($M = 5.56$, $SD = 5.03$) were significantly higher than post-test scores ($M = 3.29$, $SD = 4.22$), $t = 3.58$, $DF = 44$, $p = 0.00$. BEH pre-test scores ($M = 16.73$, $SD = 9.78$) were significantly higher than post-test scores ($M = 11.71$, $SD = 9.17$), $t = 3.71$, $DF = 44$, $p = 0.00$. TOTAL pre-test scores ($M = 65.31$, $SD = 38.63$) were significantly higher than post-test scores ($M = 47.09$, $SD = 34.35$), $t = 3.59$, $DF = 44$, $p = 0.00$. There was not a significant difference between CRIT pre-test scores ($M = 7.02$, $SD = 5.07$) and post-test scores ($M = 5.47$, $SD = 4.62$), $t = 2.03$, $DF = 44$, $p = 0.05$.

Participants were drawn from three separate facilities and participated in one of four different groups (HopeFoil, Equus Integration, Just Say Whoa, or Changing Leads) or individual therapy. Therefore, comparisons were made between which form of EAP participants received by using an ANOVA examining how type of therapy may have

impacted differences in secondary and tertiary construct measures between pre-test and post-test.

There were no significant differences between EAP modality and differences in secondary construct measures: ACOPE ($F = 0.07, DF = 4, p = 0.99$), BYI-SC ($F = 0.36, DF = 4, p = 0.84$), GSES ($F = 0.26, DF = 4, p = 0.90$), HSES ($F = 0.50, DF = 4, p = 0.74$), IECA ($F = 0.42, DF = 4, p = 0.79$), or QIDA ($F = 2.92, DF = 4, p = 0.03$).

There were no significant differences between EAP modality and differences in tertiary construct measures: SOM ($F = 0.22, DF = 4, p = 0.93$), INTRA ($F = 0.99, DF = 4, p = 0.43$), INTER ($F = 0.87, DF = 4, p = 0.49$), SOC ($F = 1.51, DF = 4, p = 0.22$), BEH ($F = 1.42, DF = 4, p = 0.24$), CRIT ($F = 0.43, DF = 4, p = 0.79$), or TOTAL ($F = 1.28, DF = 4, p = 0.30$).

Hypothesis 2

Hypothesis 2 was that the degree of attachment to the therapy horses at post-test would account for the amount improvement between pre-test and post-test questionnaire scores for secondary level constructs. To test this, a series of repeated measures ANOVAs were utilized with LAPS post-test scores as a between-subjects factor. Pre-test and post-test scores for A-COPE, BYI-SC, HSES, GSES, IECA, and QIDA were entered as within-subjects factors. LAPS scores accounted for a significant amount of the variance GSES scores between pre-test ($M = 29.16, SD = 5.69$) and post-test ($M = 30.82, SD = 5.91$), $F = 6.96, DF = 30, p = 0.00$. However, LAPS scores did not significantly account for differences in ACOPE scores ($F = 0.97, DF = 1, p = .056$), BYI-SC scores ($F = 0.43, DF = 30, p = 0.97$), HSES scores ($F = 0.69, DF = 30, p = 0.80$), IECA scores ($F = 1.46, DF = 30, p = 0.250$), or QIDA scores ($F = 1.15, DF = 30, p = 0.42$).

Hypothesis 3

Hypothesis 3 was that higher levels of pre-existing animal affinity was predicted to be related to the development of stronger HAB with therapy horses, which would result in increased changes in secondary level constructs. To test this, the relationship between pre-test MRCPS COM, pre-test MRCPS ATT, and post-test LAPS was examined using Pearson correlation for linear regression. There were no significant correlations between LAPS and MRCPS COM, $r = -0.11, p = 0.47$ or between LAPS and MRCPS ATT, $r = -0.29, p = 0.06$. There was also no significant correlation between MRCPS COM and MRCPS ATT, $r = -0.28, p = 0.07$.

In addition, pre-test MRCPS COM and pre-test MRCPS ATT scores were entered as covariates into the above-mentioned repeated measures ANOVAs using pre-test LAPS scores as the between-subject variable and pre-test and post-test A-COPE, BYI-SC, HSES, GSES, IECA, and QIDA as within-subjects variables. MRCPS ATT significantly influenced improvement in GSES scores, $F = 8.40, DF = 1, p = 0.01$. However, MRCPS ATT did not significantly influence improvement in ACOPE scores ($F = 2.05, DF = 1, p = 0.18$), BYI-SC scores ($F = 1.03, DF = 1, p = 0.33$), HSES scores ($F = 1.45, DF = 1, p = 0.25$), IECA scores ($F = 0.19, DF = 1, p = 0.67$), or QIDA scores ($F = 0.13, DF = 1, p = 0.73$). Similarly, MRCPS COM did not significantly influence improvement in ACOPE scores ($F = 0.22, DF = 1, p = 0.65$), BYI-SC scores ($F = 0.16, DF = 1, p = 0.70$), GSES scores ($F = 0.22, DF = 1, p = 0.65$), HSES scores ($F = 0.85, DF = 1, p = 0.38$), IECA scores ($F = 0.46, DF = 1, p = 0.51$), or QIDA scores ($F = 4.40, DF = 1, p = 0.06$).

Hypothesis 4

Hypothesis 4 was that the degree of change in the secondary level measures would predict the magnitude of change in the tertiary level measures. The difference in scores from intake to discharge on questionnaires measuring secondary level constructs (A-COPE, BYI-SC, HSES, GSES, IECA, and QIDA) were entered as independent variables into a series of linear regressions using the enter method. These regressions utilized differences in scores from pre-test to post-test on Y-OQ subscales as dependent variables.

Secondary level measures as a whole did not account for a significant amount of SOM variance ($F = 1.21, DF = 6, p = 0.32$). None of the secondary level measures individually accounted for a significant amount of variance, including ACOPE ($t = -1.17, p = 0.25$), BYI-SC ($t = -0.24, p = 0.81$), GSES ($t = 0.26, p = 0.80$), HSES ($t = -0.79, p = 0.43$), IECA ($t = 0.63, p = 0.53$), or QIDA ($t = -2.06, p = 0.05$).

Secondary level measures as a whole did not account for a significant amount of INTRA variance ($F = 0.34, DF = 6, p = 0.91$). None of the secondary level measures individually accounted for a significant amount of variance, including ACOPE ($t = -0.08, p = 0.94$), BYI-SC ($t = 0.46, p = 0.65$), GSES ($t = 0.23, p = 0.82$), HSES ($t = -0.56, p = 0.58$), IECA ($t = -1.15, p = 0.26$), or QIDA ($t = 0.37, p = 0.72$).

Secondary level measures as a whole did not account for a significant amount of INTER variance ($F = 0.32, DF = 6, p = 0.92$). None of the secondary level measures individually accounted for a significant amount of variance, including ACOPE ($t = -0.69, p = 0.50$), BYI-SC ($t = -0.03, p = 0.98$), GSES ($t = -0.17, p = 0.87$), HSES ($t = -0.45, p = 0.66$), IECA ($t = -0.93, p = 0.36$), or QIDA ($t = -0.75, p = 0.46$).

Secondary level measures as a whole did not account for a significant amount of SOC variance ($F = 0.76$, $DF = 6$, $p = 0.61$). None of the secondary level measures individually accounted for a significant amount of variance, including ACOPE ($t = 1.04$, $p = 0.30$), BYI-SC ($t = 0.92$, $p = 0.36$), GSES ($t = 0.72$, $p = 0.48$), HSES ($t = -1.50$, $p = 0.14$), IECA ($t = 0.68$, $p = 0.50$), or QIDA ($t = 0.81$, $p = 0.42$).

Secondary level measures as a whole did not account for a significant amount of BEH variance ($F = 0.43$, $DF = 6$, $p = 0.85$). None of the secondary level measures individually accounted for a significant amount of variance, including ACOPE ($t = -0.53$, $p = 0.60$), BYI-SC ($t = -0.93$, $p = 0.36$), GSES ($t = 0.40$, $p = 0.69$), HSES ($t = -0.66$, $p = 0.51$), IECA ($t = -0.17$, $p = 0.86$), or QIDA ($t = -0.63$, $p = 0.53$).

Secondary level measures as a whole did not account for a significant amount of CRIT variance ($F = 0.19$, $DF = 6$, $p = 0.98$). None of the secondary level measures individually accounted for a significant amount of variance, including ACOPE ($t = -0.62$, $p = 0.54$), BYI-SC ($t = 0.27$, $p = 0.79$), GSES ($t = 0.44$, $p = 0.66$), HSES ($t = -0.18$, $p = 0.86$), IECA ($t = 0.24$, $p = 0.81$), or QIDA ($t = -0.50$, $p = 0.62$).

Secondary level measures as a whole did not account for a significant amount of TOTAL variance ($F = 0.14$, $DF = 6$, $p = 0.99$). None of the secondary level measures individually accounted for a significant amount of variance, including ACOPE ($t = -0.10$, $p = 0.92$), BYI-SC ($t = -0.21$, $p = 0.84$), GSES ($t = 0.33$, $p = 0.74$), HSES ($t = -0.61$, $p = 0.55$), IECA ($t = -0.31$, $p = 0.76$), or QIDA ($t = -0.21$, $p = 0.84$).

Hypothesis 5

Hypothesis 5 was that treatment gains in the secondary and tertiary level would persist during the four-week follow-up period as indicated by no significant changes in

questionnaire scores from post-test to follow-up. Scores on measures for secondary level constructs (A-COPE, BYI-SC, HSES, GSES, IECA, and QIDA) and the tertiary level constructs (Y-OQ subscales) from immediately after discharge and four weeks following discharge were compared utilizing a series of paired samples *t*-tests.

There were no significant changes in scores between post-test scores and the four-week follow-up scores for secondary level measures: ACOPE ($t = 0.30, DF = 2, p = 0.80$), BYI-SC ($t = -2.07, DF = 2, p = 0.18$), GSES ($t = -1.42, DF = 2, p = 0.29$), HSES ($t = -0.74, DF = 2, p = 0.54$), IECA ($t = 1.38, DF = 2, p = 0.30$), or QIDA ($t = 1.03, DF = 2, p = 0.41$).

There were no significant changes in scores between post-test scores and the four-week follow-up scores for tertiary level measures: SOM ($t = 2.22, DF = 2, p = 0.16$), INTRA ($t = 0.61, DF = 2, p = 0.60$), INTRA ($t = 1.39, DF = 2, p = 0.30$), INTER ($t = 1.39, DF = 2, p = 0.30$), SOC ($t = 0.56, DF = 2, p = 0.64$), BEH ($t = 1.75, DF = 2, p = 0.22$), CUNIT ($t = 2.50, DF = 2, p = 0.13$), or TOTAL ($t = 0.45, DF = 2, p = 0.69$).

Post-Hoc Statistical Analyses

Results indicated that there were significant differences between pre-test and post-test scores for the majority of Y-OQ scales, which were completed by legal guardians and were tertiary level constructs. However, there were no significant differences between pre-test and post-test scores for any of the secondary construct measures, which were completed by participants. Several participants were suspected of variable responding, as was indicated by answering questionnaires in an identifiable pattern (e.g., 12341234, etc.) or answering an entire questionnaire with one response (e.g., answering every question "1" even with reverse-scored items). If some participants did answer questionnaires in a

variable manner that did not indicate their true responses, this would significantly impact statistical analysis. Therefore, 15 participants who were suspected of variable responding based on the above criteria were removed from the data set, leaving 30 participants in the reduced sample.

Hypothesis 1

Hypothesis 1 was that participants in the reduced sample would experience treatment gains in secondary and tertiary constructs as a result of participating in EAP. Changes in secondary and tertiary constructs were assessed with a series of paired samples *t*-tests. Results indicated that participants' scores on ACOPE increased significantly from pre-test ($M = 168.33$, $SD = 21.06$) to post-test ($M = 183.93$, $SD = 24.01$), $t = -4.20$, $DF = 29$, $p = 0.00$. Participants' scores on QIDA decreased significantly from pre-test ($M = 73.27$, $SD = 24.82$) to post-test ($M = 61.77$, $SD = 20.05$), $t = 2.67$, $DF = 29$, $p = 0.01$. There were no significant differences between pre-test and post-test scores for BYI-SC ($t = -0.76$, $DF = 29$, $p = 0.45$), GSES ($t = -1.93$, $DF = 29$, $p = 0.06$), HSES ($t = -1.35$, $DF = 29$, $p = 0.19$), or IECA ($t = -0.23$, $DF = 29$, $p = 0.82$).

Pre-test means for secondary level measures were as follows: ACOPE ($M = 168.33$, $SD = 21.06$), BYI-SC ($M = 49.20$, $SD = 8.57$), GSES ($M = 29.00$, $SD = 4.47$), HSES ($M = 86.80$, $SD = 9.16$), IECA ($M = 135.17$, $SD = 21.38$), and QIDA ($M = 73.27$, $SD = 24.82$).

Post-test means for secondary level measures were as follows: ($M = 183.93$, $SD = 24.01$), BYI-SC ($M = 49.20$, $SD = 10.49$), GSES ($M = 31.20$, $SD = 5.05$), HSES ($M = 89.37$, $SD = 12.24$), IECA ($M = 135.83$, $SD = 21.38$), and QIDA ($M = 61.77$, $SD = 20.05$).

Hypothesis 2

Hypothesis 2 was that the degree of attachment to the therapy horses at post-test would account for a significant amount of improvement between pre-test and post-test questionnaire scores for secondary level constructs in the reduced sample. To test this, a series of repeated measures ANOVAs were computed. Post-test LAPS scores were utilized as the between-subjects factor and pre-test and post-test secondary construct scores (ACOPE, BYI-SC, GSES, HSES, IECA, and QIDA) were utilized as within-subjects factors.

LAPS did not significantly account for improvements in ACOPE scores ($F = 0.717, DF = 22, p = 0.74$), BYI-SC scores ($F = 0.38, DF = 22, p = 0.95$), GSES scores ($F = 2.41, DF = 22, p = 0.17$), HSES scores ($F = 2.66, DF = 22, p = 0.14$), IECA scores ($F = 0.88, DF = 22, p = 0.88$), or QIDA scores ($F = 1.02, DF = 22, p = 0.55$).

In order to assess whether participants were more attached to therapy horses at discharge than prior to starting treatment, pre-test and post-test LAPS scores were entered into a paired samples *t*-test using the entire data set of 45 participants. There was no significant difference between pre-test LAPS scores ($M = 42.42, SD = 19.69$) and post-test LAPS scores ($M = 46.91, SD = 16.73$), $t = -1.59, DF = 44, p = 0.12$. Participants who had participated in EAP treatment prior to this study may have also been more attached to therapy horses at pre-test as compared to those who had not been exposed to EAP in the past. Therefore, an ANOVA using pre-test LAPS scores as a dependent factor and prior EAP or no prior EAP as factors was calculated. There was no significant

difference in pre-test LAPS scores between those who had previously participated

($M = 41.71$, $SD = 20.73$) and those who had not previously participated in EAP ($M = 42.86$, $SD = 19.41$), $F = 0.04$, $DF = 1$, $p = 0.85$.

Hypothesis 3

Hypothesis 3 was that higher levels of pre-existing animal affinity was predicted to be related to the development of stronger HAB with therapy horses, which would result in increased changes in secondary constructs for the reduced sample. To test this, the relationship between pre-test MRCPS COM, pre-test MRCPS ATT, and post-test LAPS was examined using Pearson correlation for linear regression. Results indicated that LAPS was not significantly correlated with MRCPS ATT ($r = -0.37$, $p = 0.05$) or MRCPS COM ($r = -0.10$, $p = 0.58$). MRCPS ATT and MRCPS COM were also not significantly correlated ($r = -0.33$, $p = 0.07$).

In addition, pre-test MRCPS COM and pre-test MRCPS ATT scores were entered as covariates into the above-mentioned repeated measures ANOVAs using pre-test LAPS scores as the between-subject variable and pre-test and post-test A-COPE, BYI-SC, HSES, GSES, IECA, QIDA, and Y-OQ subscales as within-subjects variables.

MRCPS ATT did not significantly influence improvements in ACOPE scores ($F = 1.67$, $DF = 1$, $p = 0.25$), BYI-SC scores ($F = 1.00$, $DF = 1$, $p = 0.36$), GSES scores ($F = 2.76$, $DF = 1$, $p = 0.16$), HSES scores ($F = 5.31$, $DF = 1$, $p = 0.07$), IECA scores ($F = 0.26$, $DF = 1$, $p = 0.63$), or QIDA scores ($F = 2.09$, $DF = 1$, $p = 0.21$).

MRCPS COM did not significantly influence improvements in ACOPE scores ($F = 0.76$, $DF = 1$, $p = 0.42$), BYI-SC scores ($F = 0.20$, $DF = 1$, $p = 0.67$), GSES scores ($F = 2.76$, $DF = 1$, $p = 0.16$), HSES scores ($F = 5.31$, $DF = 1$, $p = 0.07$), IECA scores ($F = 0.50$, $DF = 1$, $p = 0.51$), or QIDA scores ($F = 5.51$, $DF = 1$, $p = 0.06$).

Hypothesis 1

To assess whether the degree of change in the secondary level constructs would predict changes in the tertiary level, the differences in scores from pre-test to post-test on questionnaires measuring secondary level constructs (A-COPE, BYI-SC, HSES, GSES, IECA, and QIDA) were entered using the enter method as independent variables into a series of linear regressions. These regressions utilized differences in scores from pre-test to post-test on Y-OQ subscales as dependent variables.

Secondary level measures as a whole did not account for a significant amount of variance for SOM ($F = 1.10, DF = 6, p = 0.39$), INTRA ($F = 0.42, DF = 6, p = 0.86$), INTER ($F = 0.33, DF = 6, p = 0.91$), SOC ($F = 0.62, DF = 6, p = 0.71$), BEH ($F = 0.27, DF = 6, p = 0.95$), CRIT ($F = 0.28, DF = 6, p = 0.94$), or TOTAL ($F = 0.25, DF = 6, p = 0.95$).

Hypothesis 5

Additional statistical analyses to examine hypothesis 5 were not calculated with the reduced sample because no participant who completed follow-up questionnaires was removed for variable responding. Therefore, statistical analyses would not change for the reduced sample.

CHAPTER IV

DISCUSSION

Participants who were included in the final sample for data analysis were significantly older than participants who were excluded due to not completing post-testing. However, there were no significant differences in pre-test self-report measures for attachment to the therapy horses or attachment and commitment to their own pets. In addition, no participant withdrew from any of the EAP treatment programs, which indicates that there may have been more reluctance to complete post-test questionnaires rather than dissatisfaction with the therapeutic programs or impaired attachment to therapy animals. It is likely that younger participants may have been less motivated or less willing to complete the multiple questionnaires, which took an average of 45-60 minutes for each participant to complete. Research suggests that children younger than age 13 may benefit more from EAP than older children (Cawley et al., 1988). Therefore, the attrition of younger participants may have impacted statistical findings by decreasing the total amount of change in participants as a group. However, research suggests that children of all ages and adults can benefit from EAP (e.g., Bizub et al., 2003; MacDonald et al., 2007; Schindler, 2008). Therefore, it is important to understand treatment gains in all age groups and findings were still expected to reach statistical significance.

There were no significant differences in pre-test self-report measures for secondary level constructs, which indicates that participants who did not complete post-tests did not perceive themselves as having more or less severe mental health concerns than participants who did complete post-testing. Tertiary level measures that were completed by legal guardians indicated that participants who were included in the final sample had significantly more physical discomfort (SOM), engaged in more delinquent or aggressive behaviors (SOC), and had more difficulty with organizing tasks, completing assignments, concentrating, and inattentiveness (BEH) than those who were not included. These increased somatic symptoms, social problems, and behavioral dysfunctions may have impacted the findings of this study. However, research indicates that EAP has produced therapeutic gains in populations with a range in symptom severity (e.g., Beiber, 1983; Bizub et al., 2003; MacDonald et al., 2007; Schultz, 2005; Schultz, Remick-Barlow, & Robbins, 2007). Therefore, it is unlikely that attrition of participants with less severe symptoms would significantly impact statistical findings.

Hypothesis 1

Hypothesis 1 was that participants in the reduced sample would experience treatment-related secondary and tertiary constructs as a result of participating in EAP. It was partially supported.

Results indicated that there were significant changes in most tertiary level construct scales between pre-test and post-test. Questionnaire scores indicated that legal guardians perceived a decrease in participants' somatic distress (SOM), including headaches, dizziness, nausea, and physical weakness. Legal guardians also perceived a reduction in participants' levels of intrapersonal distress (INTRA), including outward

manifestations of anxiety, depression, fearfulness, and self-harm. In addition, legal guardians perceived a reduction in participants' difficulties with interpersonal relations (INTER), including communication problems, arguing, unhelpful attitudes towards others, and defiance, as well as social problems (SOC), including delinquent and aggressive behaviors. Legal guardians also perceived a decrease in behavioral dysfunction (BEH), including inattentiveness, inability to manage frustration, impulsivity, and difficulties with concentration. When examining an aggregate of these subscales (TOTAL), it appears that legal guardians perceived a significant reduction in distress, behavioral difficulties, and emotional difficulties in participants' lives.

There was only one tertiary construct scale that did not demonstrate a statistically significant change between pre-test and post-test. Legal guardians did not perceive a significant decrease in critical items (CRIT), which includes severe symptoms that are typically treated within an inpatient setting, such as hallucinations, delusions, suicidal thoughts, and manic symptoms. This finding may indicate that EAP is not effective in reducing symptoms of this severity, particularly given the difficulty in treating such symptoms in an outpatient setting. However, upon examining mean scores between pre-test and post-test, the average critical item score was 7.02 at pre-test and 5.47 at post-test out of a maximum score of 36 on this scale. This suggests that legal guardians did not perceive that the participants had many severe symptoms prior to beginning EAP. Given the low CRIT scale score prior to beginning treatment, floor effects for the measure may have masked significant changes, particularly given that there was a decrease between pre-test and post-test scores. In addition, this decrease would have been statistically significant with a more lenient significance threshold of $\alpha \leq 0.05$.

There were no significant differences in Y-OQ scale scores from pre-test to post-test between participants who received HopeFoil, Equus Integration, Just Say Whoa, Changing Leads, or individual therapy. This suggests that treatment gains perceived by guardians were consistent across treatment modalities, treatment programs, and facilities. This finding was incongruent with previous research indicating that different EAP programs vary in effectiveness (MacDonald, 2004). Across the treatment modalities and facilities, there was also a wide range of treatment contact hours between groups; participants in Equus Integration only had three hrs of contact whereas Just Say Whoa participants had 16 hrs of contact. Pearson (1997) found that treatment gains were correlated with higher numbers of sessions, but this was not reflected in the current study's findings. Results from the present study indicate that EAP appears to be effective in reducing child symptoms observed by legal guardians, regardless of treatment program, treatment modality, or duration, which lends support for EAP as a robust treatment option even with a limited duration.

Despite finding multiple significant improvements in tertiary level construct scales, there were no significant differences between pre-test scores and post-test scores for secondary level construct measures. This would suggest that participants did not perceive that they experienced increased coping ability (ACOPE), self-concept (BYI-SC), self-efficacy (GSES), self-esteem (HSES), or empathy for others (IECA), and that they did not perceive a reduction in interpersonal difficulties (QIDA). There were no significant differences in secondary construct measure scores between participants who received HopeFoil, Equus Integration, Just Say Whoa, Changing Leads, or individual

therapy. This suggests that there were no apparent factors between facilities, programs, or treatment modality type that would account for non-significant findings.

In further examination of secondary measure scores, pre-test and post-test means indicated improvement on each scale that did not reach statistical significance. This suggests that participants may have actually experienced treatment gains that were not detected accurately by self-report measures. The most notable factor influencing this possibility is the finding that there were significant improvements on the majority of tertiary level construct scales, which were completed by legal guardians, but no significant improvements on secondary level construct measures, which were completed by participants. This would suggest that legal guardians perceived improvement in their children across a large spectrum of mental health concerns while the participants perceived no improvement in themselves. This discrepancy is large and causes questioning of what might account for such disparity.

In examining raw data, several participants were suspected of variable responding, as was indicated by answering questionnaires in an identifiable pattern (e.g., 12341234, etc.) or answering an entire questionnaire with one response (e.g., answering every question "1," even with reverse-scored items). If some participants did answer questionnaires in a variable manner that did not indicate their true responses, this would significantly impact statistical analysis. It would also account for the discrepancy between improvement indicated through legal guardian questionnaires and lack of improvement indicated through self-report measures. Therefore, 15 participants who were suspected of variable responding based on the above criteria were removed from the data set, leaving 30 participants in the reduced sample.

When examining the reduced sample, improvements between pre-test and post-test for two secondary construct measures became significant. Results indicated that participants' perceived a significant increase in overall adaptive coping ability (ACOPE) as well as a significant decrease in interpersonal difficulties, including communication ability and assertiveness (QIDA). However, there remained no significant improvements in self-concept (BYI-SC), self-efficacy (GSES), self-esteem (HSES), or empathy towards others (IECA).

A factor that may have accounted for differences in significant findings after participants suspected of variable responding were removed is the design of the questionnaires themselves. ACOPE (54 questions, score range = 54-245) and QIDA (40 questions, range = 40-160) have substantially more questions and/or range of potential scores than BYI-SC (20 questions, range = 4-70), GSES (10 questions, range = 10-40), HSES (30 questions, range = 30-120) and IECA (22 questions; range = 22-198). While the HSES has a similar number of questions as ACOPE and QIDA and the IECA has a similarly large range of potential scores, ACOPE and QIDA combine both more questions and larger range. This combination of more questions and larger range may be more adept at identifying nuances in symptoms and obtaining scores that reflect changes. While the true nature of this possibility remains unknown, it is a factor that might account for non-significant findings for the remaining secondary level constructs and should be considered.

In addition, it was not possible to determine with certainty which participants responded in a variable fashion. There is the potential that some participants who were removed were responding honestly and it is likely that participants who responded in a

variable fashion remained in the data set. Therefore, the finding that participants may have gained a significant amount of adaptive coping ability and reduced interpersonal difficulties as a result of participating in EAP should be interpreted with caution.

Hypothesis 2

Hypothesis 2 was that the degree of attachment to the therapy horses at post-test would account for a significant amount of improvement between pre-test and post-test questionnaires scores for secondary level constructs. It was partially supported.

Post-test LAPS scores accounted for a significant amount of the variance in self-efficacy (GSES) scores between pre-test and post-test. However, post-test LAPS scores did not account for a significant amount of variance in change between pre-test and post-test scores in coping (ACOPE), self-concept (BYI-SC), self-esteem (HSES), empathy for others (IECA), or interpersonal difficulties (QIDA). These results suggest that participants who were more attached to therapy horses experienced greater treatment gains in self-efficacy than those who had a lesser degree of attachment to the therapy horses; however, it does not appear that attachment to the therapy horses influenced treatment gains in any other secondary construct measure.

When examining the reduced sample, LAPS scores similarly did not account for a significant amount of variance in change between pre-test and post-test scores in coping, self-concept, self-esteem, empathy for others, or interpersonal difficulties. This would again suggest that participants' attachment to the therapy horses did not influence treatment gains in these secondary measures. In addition, the finding that participants who were more attached to therapy horses experienced greater gains in self-efficacy

became non-significant in the reduced sample. This would indicate that this finding may not be robust and could potentially be an anomaly in the data.

When considering the statistical results of the full sample and reduced sample, these findings may indicate that HAB with therapy horses may not be the primary mechanism of change for treatment efficacy. However, it also appears that participant responses for LAPS may have been influenced by demand characteristics. Although only the post-test LAPS was intended for use in this study, participants completed LAPS at both pre-test and post-test in order to simplify data collection by having the same participant packet at both administrations. When comparing pre-test LAPS to post-test LAPS, there was no significant difference between scores. Potential LAPS scores may range from 0-69, with 69 indicating the highest amount of HAB. The pre-test LAPS mean for the full sample was 42.42, which was indicative of a moderate amount of HAB with the therapy horses. It is reasonable to expect that pre-test LAPS scores should have been significantly lower since participants had not yet met the therapy horses and had no opportunity to form a HAB.

Another consideration that may have produced higher than expected LAPS pre-test scores was that 17 participants from the full sample indicated that they had participated in EAP prior to this study. Therefore, participants who had previously participated in EAP may have drawn on prior experiences in completing the LAPS rather than completing the questionnaire based on horses that they had not yet met at the treatment facilities. However, there were no significant differences in pre-test LAPS scores between those who had previously participated in EAP and those who had not.

This suggests that, on average, all participants ranked their HAB with therapy horses at a moderate level, even if they had no prior experience with therapy horses.

Taken together, these findings suggest that participants may have answered pre-test LAPS more favorably than they actually felt towards the therapy horses in order to satisfy the researcher and/or their treatment teams. It is likely that a similar demand characteristic may have been present at post-testing, which would reduce the amount of variability in participants' self-reported actual attachment to therapy horses. This decrease in variability would make statistical analysis of how differences in attachment impacted treatment gains in secondary construct measures less powerful. In addition, the above-mentioned difficulties with variable responding and the lack of significant differences between pre-test and post-test scores for secondary construct measures would also produce difficulties in understanding how post-test LAPS scores may have contributed to treatment gains. Therefore, it appears that there were multiple factors that may have contributed to non-significant findings and that HAB with therapy horses may still be a primary mechanism of change

Hypothesis 3

Hypothesis 3 was that higher levels of pre-existing animal affinity was predicted to be related to the development of stronger HAB with therapy horses, which would result in increased changes in secondary and tertiary constructs. It was partially supported.

Pre-test MRCPS ATT scores significantly co-varied with the relationship between post-test LAPS scores and the change in GSES scores from pre-test to post-test. As was discussed previously, attachment to therapy horses significantly impacted development of

self-efficacy. It appears that attachment to personal pets moderated this relationship. This lends support that attachment to personal pets may positively impact the development of attachment with therapy horses and produce changes in self-efficacy. This would lend support that children with a stronger attachment to their own pets may benefit more from EAP. However, this relationship became non-significant in the reduced sample. Similarly, there were no significant improvements in self-efficacy from pre-test to post-test, which suggests that this relationship may not be robust or may be result of an anomaly in the data.

MRCPS ATT scores did not significantly co-vary with the relationship between post-test LAPS scores and the change in ACOPE, BYI-SC, HSES, IECA, or QIDA for the full or reduced samples. Similarly, MRCPS COM scores did not significantly co-vary with the relationship between post-test LAPS scores and any secondary level construct measures for the full or reduced samples. These findings suggest that neither attachment nor commitment to personal pets significantly impacts the relationship between attachment to therapy horses at the end of treatment and the development of coping, self-concept, self-esteem, empathy towards others, or interpersonal difficulties. It also appears that commitment to personal pets does not significantly impact the relationship between attachment to therapy horses at the end of treatment and the development of self-efficacy. Given the findings from hypothesis 2 that attachment to therapy horses at the end of treatment did not produce significant improvements in coping, self-concept, self-esteem, empathy towards others, or interpersonal difficulties, it is not surprising that attachment to personal pets and commitment to personal pets did not significantly impact these relationships.

There were no significant correlations between post-test LAPS and pre-test MRCPS ATT or pre-test MRCPS COM for the full sample or the reduced sample. This suggests that attachment to personal pets and commitment to personal pets do not influence the development of attachment with therapy horses. However, confounds could have influenced actual MRCPS ATT and MRCPS COM scores and produced non-significant findings. One potential confound is the possible presence of ceiling effects. MRCPS COM potential scores range from 10-50. The pre-test mean was 41.78, but the mode was 50 (10 participants) and 71% of participants (32 participants) had scores of 40 or above. This would suggest that the majority of participants had strong commitment to their pets and there was little variability at this upper end of the measure.

Another concern is the design of MRCPS as a questionnaire. MRCPS consists of MRCPS COM (10 questions) followed by MRCPS ATT (12 questions). Both sections use the same Likert scale (1 = Strongly Agree; 5 = Strongly Disagree). However, higher scores on MRCPS COM indicate stronger commitment to pets while lower scores on MRCPS ATT indicate stronger attachment to pets. Participants may have inadvertently answered MRCPS ATT in the opposite direction than they intended to due to the reversed application of the Likert scale in the second scale. When examining the data, 20% of the participants (N = 9) obtained 10 or less points of difference between their pre-test MRCPS COM and pre-test MRCPS ATT scores. This indicates that these participants had high commitment and low attachment to pets or low commitment and high attachment to pets. While commitment and attachment are separate constructs, they are both components of the HAB and are generally related (Saats et al., 1996). Therefore, this discrepancy in a large portion of participants may be indicative of variable responding.

which would lessen the likelihood of accurately detecting how commitment and attachment to personal pets impact attachment with therapy horses and the resulting treatment gains.

Hypothesis 4

Hypothesis 4 was that the degree of change in the secondary level measures would predict the magnitude of change in the tertiary level measures. It was not supported.

Changes in secondary level measures from pre-test to post-test did not account for a significant amount of variance on any Y-OQ scale for the full or reduced samples. This suggests that treatment gains in coping, self-concept, self-efficacy, self-esteem, empathy for others, or interpersonal difficulties were not related to treatment gains in somatic symptoms, intrapersonal distress, interpersonal relations, social problems, behavioral dysfunction, critical items, or the aggregate of symptoms. This would indicate that the distinction between secondary level constructs and tertiary level constructs is incorrect. Instead, all of these symptoms and treatment targets may be equally impacted by HAB with therapy horses, be caused by a mechanism of change other than HAB, or may not be related. This possibility is difficult to fully ascertain from this data due to potential confounds of variable responding. Parent report scales demonstrated improvements from pre-test to post-test in somatic symptoms, intrapersonal distress, interpersonal relations, social problems, behavioral dysfunction, and aggregate symptoms for the total sample. However, participant self-report measures did not reflect significant change in coping, self-concept, self-efficacy, self-esteem, empathy for others, or interpersonal difficulties for the total sample. This may be indicative that participant scores did not reflect their

true functioning or change in functioning for the secondary level constructs. If participants scores were more reliably indicative of their functioning and change in secondary level constructs, these constructs may actually account for a significant amount of change in tertiary constructs.

Hypothesis 5

Hypothesis 5 was that treatment gains in the secondary and tertiary level would persist during the four-week follow-up period as indicated by no significant changes in questionnaire scores from post-test to follow-up. This was supported.

There were no changes between post-test and follow-up in any secondary level constructs or tertiary level constructs. This indicates that participants did not experience a decrease in coping, self-concept, self-efficacy, self-esteem, or empathy for others or an increase in interpersonal difficulties in the full sample. Similarly, participants did not experience an increase in somatic symptoms, intrapersonal distress, interpersonal relations, social problems, behavioral dysfunction, critical items, or the aggregate of symptoms in the full sample.

Despite these supportive results, they must be interpreted with caution. An important consideration is that results from hypothesis 1 indicated that participants did not initially experience treatment gains in coping, self-concept, self-efficacy, self-esteem, empathy for others, or interpersonal difficulties in the full or reduced sample. Therefore, the lack of difference between post-test and follow-up questionnaires indicates that there remained no treatment gains for these constructs. However, results from hypothesis 1 also indicated that participants' legal guardians perceived significant improvement in somatic symptoms, intrapersonal distress, interpersonal relations, social problems, behavioral

dysfunction, and the aggregate of symptoms in the full sample. The lack of difference between post-test and follow-up questionnaires for these constructs indicates that treatment gains were maintained for four weeks after EAP treatment ended.

While treatment gains for tertiary level constructs remained stable at the follow-up, a concern is that only three participants from one program completed follow-up questionnaires. This return rate (6.67%) is substantially lower than the typical return rate (27.00%) for mailed self-report measures (Matteson, 1974). Therefore, it is unknown whether these three participants were remarkably different in opinions toward treatment, perceived benefits from treatment, or other psychosocial factors as compared to participants in the study who did not return the follow-up questionnaires. This low return rate is likely indicative of participants' reluctance to complete the follow-up questionnaires. This finding may also suggest that participants may have been disinclined to complete pre-test and post-test questionnaires, which would lend further support for variable responding in self-report measures as an explanatory factor for non-significant results for other hypotheses.

Conclusion

Overall, the Tri-Level Mechanisms of Change (TLMC) conceptualization was only partially supported as an explanatory model for mechanisms of change in EAP. Results indicate that participants' legal guardians perceived a significant reduction of symptoms in participants' somatic distress, intrapersonal distress, interpersonal relations, social problems, behavioral dysfunction, and mental health symptoms as a whole. This replicates findings from Schultz's (2006) study that found that legal guardians perceived significantly less intrapersonal distress and behavioral dysfunction and significantly

better interpersonal relations for children in EAP, as assessed with the Y-OQ. Treatment gains perceived by legal guardians in this study were maintained at the four-week follow-up, which suggests that the changes were long-lasting. However, legal guardians did not perceive a significant reduction in severe symptoms, such as hallucinations, delusions, or suicidal ideation, which were already low prior to starting treatment. There were no differences between treatment programs, treatment modalities, or treatment facilities, which indicates that the treatment gains occurred regardless of how EAP was specifically implemented. This lends strong support to the efficacy of EAP as a treatment for tertiary level constructs, and it appears that these findings are robust.

Despite this strong support, there were no significant treatment gains for participants' secondary level constructs, including coping ability, self-concept, self-efficacy, self-esteem, empathy for others, or interpersonal difficulties in the full sample. Due to this lack of improvement, follow-up analyses could not demonstrate that treatment gains were maintained. In addition, attachment to therapy horses and attachment to personal pets both accounted for a significant amount of variance in improvement in self-efficacy scores in the full sample, but these relationships became non-significant in the reduced sample. This would indicate that these findings may not be robust and could potentially be an anomaly in the data, particularly because there was no significant improvement in self-efficacy as a result of participating in EAP. Similarly, attachment to personal pets, commitment to personal pets, and attachment to therapy horses did not account for a significant amount of variance in improvement in any other secondary level constructs in either the full or reduced sample. In addition, the degree of change in the secondary level measures did not predict the magnitude of change in the tertiary level

measures. However, several factors may account for the non-significant findings in this study.

One potential confound that may have impacted non-significant findings was the high amount of variability in diagnoses and cognitive abilities between participants. It is possible that some of the subjects did experience beneficial gains, but these differences were minimized by statistics comparing means. However, there were no significant differences in self-report measure scores between treatment programs, treatment modalities, or treatment facilities. Each treatment program served a specific population with specific mental health concerns; it is likely that significant differences between programs would have been noted if variability in diagnoses resulted in a minimization in treatment gains for secondary level constructs for the sample as a whole.

A more likely explanation for non-significant findings was that several participants were suspected of variable responding, as was indicated by answering questionnaires in an identifiable pattern. When examining the reduced sample, results indicate that participants experienced a significant improvement in coping ability and a significant decrease in interpersonal difficulties. Significant improvements in these two scales after those suspected of variable responding were removed lend support to the possibility that the secondary level construct scores were confounded by variable responding. Unfortunately, it was not possible to determine with certainty all participants who may have responded in a variable fashion. There is potential that some participants who were removed were responding honestly and it is likely that participants who responded in a variable fashion remained in the data set. Therefore it is unclear whether participants may have actually experienced improvement in coping and interpersonal

difficulties. This confound also likely impacted findings throughout the study, which makes accurate assessment of the remaining aspects of the TLMC difficult.

Another factor that may have confounded this study was the design of the questionnaires themselves. There were differences in significant findings between the full and reduced sample for secondary level constructs. ACOPE and QIDA had a combination of substantially more questions and/or range of potential scores than other secondary level construct measures. This combination may be more adept at identifying nuances in symptoms and obtaining scores that reflect changes while other scales may not have detected these changes. In addition, there may have been difficulties with the design of MRCPS. Both sections of MRCPS use the same Likert scale, but higher scores on MRCPS COM indicate stronger commitment to pets while lower scores on MRCPS ATT indicate stronger attachment to pets. A large portion of the participants obtained scores indicating that they had high commitment and low attachment to pets or low commitment and high attachment to pets. Because these constructs are generally related (Saats et al., 1996), this may be indicative of variable responding, which would confound the relationship between commitment and attachment to personal pets and attachment with therapy horses. Ceiling effects for MRCPS COM may have also reduced variability in commitment to personal pets, which would decrease statistical significance in resulting analyses.

Similarly, demand characteristics may also have impacted this study. The pre-test LAPS mean for the full sample was indicative of a moderate amount of HAB with the therapy horses, even though participants had not yet met the therapy horses and had no opportunity to form HABs. This was true even for participants who had never

participated in EAP prior to this study. These findings suggest that participants may have answered pre-test LAPS more favorably than they actually felt towards the therapy horses in order to satisfy the researcher and/or their treatment team. It is likely that a similar demand characteristic may have been present at post-testing, which would reduce the amount of variability in participants' self-reported actual attachment to therapy horses.

In addition, LAPS was revised from its original use as a measurement of attachment to personal pets to measure attachment to therapy horses in this study. While it was not anticipated that the modification would result in significant changes to its psychometric properties, this modification may have resulted in decreased reliability and/or validity. This may be more likely for one LAPS item in particular, which was the revised statement, "Owning horses adds to my happiness." Most participants did not own horses. Those that did own a horse may have answered this question thinking about their own horse. Those that did not own a horse may have answered this question by imagining *if* owning a horse in the future would add to their happiness or *if* they were able to regularly care for their assigned therapy horses would add to their happiness. Given this potential for variability in the way this question was interpreted and answered, it may have impacted their scores. If participants rated their attachment to the therapy horses differently than they actually felt, as a result of demand characteristics or problems with the scale modification, this would render understanding how HAB with therapy horses may be the primary mechanism of change impossible.

Directions for Future Research

While the findings from this study were only partially supportive of the TLMC, the presence of multiple confounds impairs the ability to accurately assess mechanisms of

change according to this theory. However, this study found that legal guardians perceived significant long-lasting improvement in multiple mental health concerns and symptoms for their children, which lends strong support to the benefits of EAP and replicates prior research. Therefore, future research examining the efficacy of EAP and further extrapolating mechanisms of change is important to understand how EAP produces change.

Given the difficulties with variable responding, there are several suggestions for future research to limit the amount of inaccurate participant self-reports. The first is to rely on measures completed by legal guardians. Legal guardians may be more likely to respond in an honest, consistent fashion due to more developed frontal lobes, which increases attention, focus, and concentration (see Berger, 2008). They may also be more likely to perceive benefits from participating in studies, which may increase the validity and reliability of their responses. However, this limits the types of data that can be collected. Another suggestion would be to limit the amount of questionnaires utilized. The participant questionnaire packet for this study took 45-60 min, on average, to complete; participants may be more likely to invest full effort in completing a smaller set of questionnaires. Similarly, participants may also be more likely to invest full effort if external incentives are offered for completing the questionnaires. Another option is conducting structured interviews with children. Children and adolescents who are participating in treatment often have emotional, attention, and behavioral symptoms that make answering written questionnaires difficult, such as hyperactivity, impulsivity, emotional discomfort, comprehension problems, and reading difficulties. A structured interview may limit how these aspects may negatively impact responding.

The extremely low return rate for four-week follow-up questionnaires was unfortunate and may also represent reluctance to complete a large questionnaire packet that is time-consuming. Therefore, reducing the number of questionnaires may result in a higher return rate. However, low return rate is also a common problem for mailed self-report measures across all spheres of psychological research (Matteson, 1974). A suggestion to increase follow-up data return is to schedule a time for children and their legal guardians to return to the treatment facility and complete follow-up questionnaires. They may be offered an opportunity to interact with the horses again after the follow-up questionnaire is completed in order to increase incentive to return to the facility.

Future research should also consider the potential difficulties with selection of questionnaires. It appears that questionnaires that have more questions and a larger range of potential scores may be more adept at detecting changes, so these types of questionnaires should be selected over shorter measures with a lower range of potential scores. Questionnaires should also be selected that utilize similar rating scales to increase participants' consistency in responding and decrease confusion in answering questionnaires. In addition, a standardized measure specifically created to assess HAB with therapy animals should be created. Because no measure of this type exists at this point in time, this study utilized a revised version of the LAPS, which was initially created and normed to understand attachment to pets. A measure specific to HAB with therapy animals may result in less potential for demand characteristics and would be a more reliable and valid measure to understand this hypothesized primary mechanism of change in EAP.

Given the growing popularity of EAP programs and AAT programs in the United States, it remains imperative to understand the mechanisms of change in this therapy modality in order to justify the increased cost with housing and caring for therapy animals. The field would significantly benefit from rigorous randomized controlled clinical trials to examine whether EAP or ATT may be an empirically supported treatment. In addition, more studies with long-term follow-up are warranted to understand how treatment gains are maintained over time. Even though the comprehensive theoretical framework for understanding mechanisms of change in EAP was only partially supported, this study still adds support for the benefits of EAP. It is hopeful that future research will continue to refine and further understand the implications of this study within the scope of the EAP and AAT field as a whole.

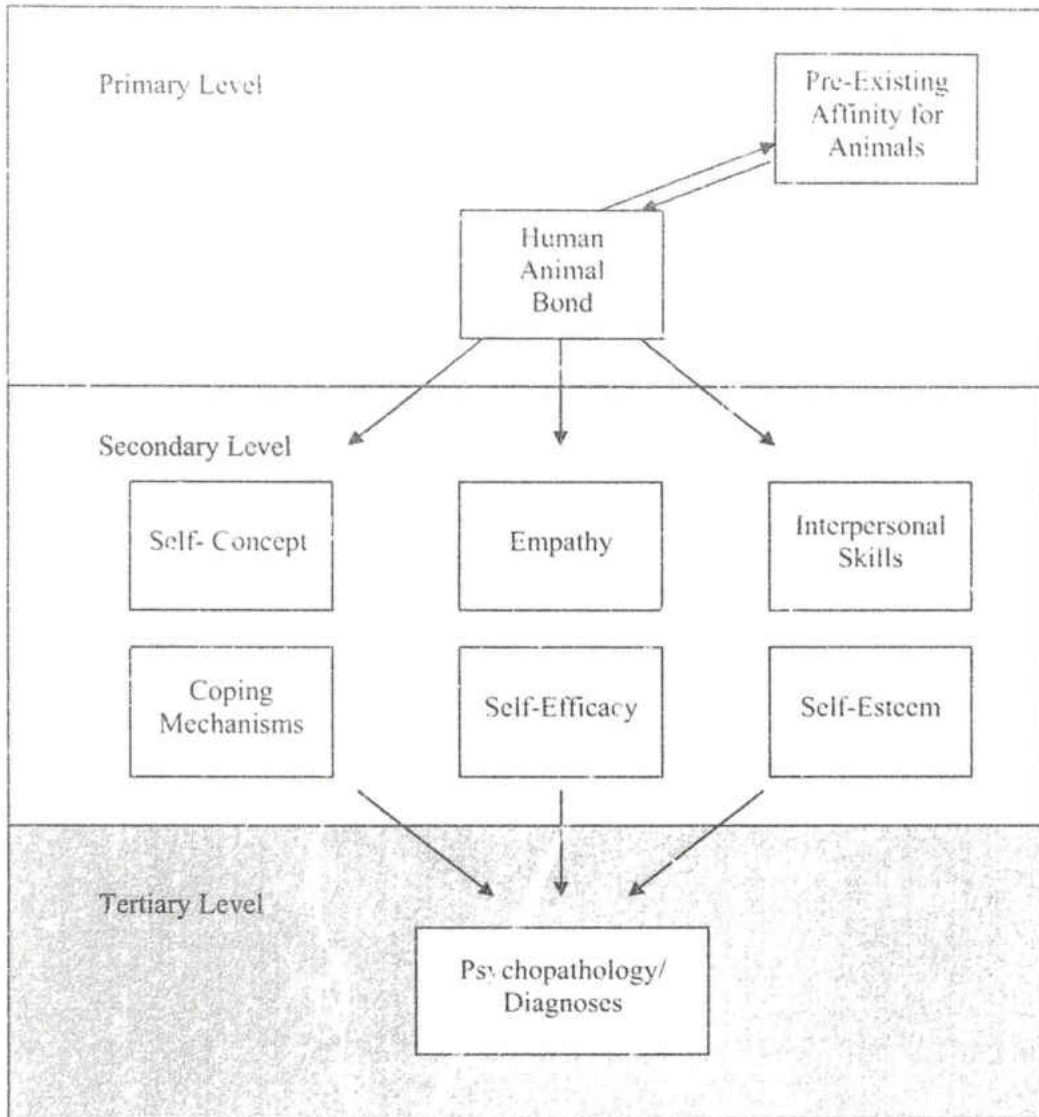


Figure 1. Figural representation of Tri-Level Mechanisms of Change (TLMC) Conceptualization

Appendix A
Informed Consent

INFORMED CONSENT TO PARTICIPATE IN PSYCHOLOGICAL RESEARCH

TITLE: Alleviating equines: Investigating the hypothesized mechanisms of change in equine assisted psychotherapy

PROJECT DIRECTOR: Kathy Korell, M.A.

PHONE: XXX-XXX-XXXX

STATEMENT OF RESEARCH:

A legal guardian of the minor who participates in this research must give his or her informed consent based on the nature and risks of the research. This document provides important information for this understanding, and you may voluntarily choose to participate or not. Please take your time in making your decision to participate. If you have questions at any time, feel free to ask.

WHAT IS THE PURPOSE OF THIS STUDY?

You and your child are invited to be in a research study that will examine whether Equine Assisted Psychotherapy (EAP), which is therapy involving horse activities, is an effective treatment component for children and adolescents. This study will examine the hypothesized EAP mechanisms of change (e.g., why therapy using horses works).

WHAT IS YOUR ROLE IN THE STUDY?

Participants and legal guardians will complete 12 self-report questionnaires when participants begin treatment and again at the end of treatment. Each self-report questionnaire will take between 2-15 minutes to complete, depending on how quickly your child works and comprehends reading and the length of each self-report questionnaire. It is estimated that the entire set of self-report questionnaires at each administration will take between 1 to 1 1/2 hours to complete, but some participants may require more time to complete the self-report questionnaires. The researcher will also send you a copy of these questionnaires four weeks after the participant is discharged from the EAP program to understand how well treatment gains generalize to home life. The researcher will provide a self-addressed, postage-paid envelope to return these documents.

Treatment options and treatment quality will not be affected whether you choose to participate in the study or not. All children and adolescents, whether in the study or not, will receive the same interventions without prejudice. If you do choose to participate, participants' demographic information, diagnostic information, treatment types and duration, and questionnaire scores will be evaluated by the researcher. The researcher will have access to identifying information, including your or your child's name. **All information will be strictly confidential.** If you do not choose to participate, you and your child will not complete any questionnaires.

WHAT ARE THE RISKS AND BENEFITS OF THE STUDY?

There is no more than minimal foreseeable risk from being in this study. These questionnaires may ask about sensitive topics that may make your child or yourself uncomfortable or upset. However, these measures do not typically cause distress and have been used for research purposes in several other studies. If you or your child does experience emotional distress, you or your child may stop at any time or choose to not answer a particular question. If you or your child would like to talk to someone about your feelings that arise from these measures, you are encouraged to contact workers at your EAP program. You or your child may not benefit personally from being in this study. However, we hope that other people might benefit from this study in the future because it may add to knowledge about EAP. This information may be utilized to enhance treatment program effectiveness. Subsequent program changes may result in faster, more effective treatment for other children and can help EAP programs to offer better and more complete services.

ALTERNATIVES TO PARTICIPATING IN THIS STUDY

You and your child's treatment will not be affected by choosing to not participate in this study. **Your child will receive the same treatment without prejudice as children who are involved in the study.**

WILL IT COST ME ANYTHING OR WILL I BE PAID FOR PARTICIPATING?

Participation is voluntary and does not have any cost or payment.

WHO IS FUNDING THE STUDY?

The University of North Dakota and the research team are receiving no payments from other agencies, organizations, or companies to conduct this research study.

CONFIDENTIALITY

The records of this study will be kept private to the extent permitted by law. In any report about this study that might be published, you will not be identified. The study record may be reviewed by Government agencies, the UND Research Development and Compliance office, and the University of North Dakota Institutional Review Board. However, **identifying information will not be released** to these organizations.

EAP therapists and/or the principle investigator will be administering self-report questionnaires when participants begin and end treatment. The principle investigator will be mailing self-report questionnaires four weeks after participants end treatment for you to complete and return. EAP therapists will not be using any data obtained in this study for treatment, and no copies of the self-report questionnaires will be made. EAP therapists will be mailing completed self-report questionnaires to the principle investigator and will not have access to scored self-report questionnaires. The principle investigator is the only individual who will have access to self-report questionnaire scores, and scores will not be released to legal guardians of participants.

Any information that is obtained in this study that can be identified with you or your child will remain confidential and will be disclosed only with your permission or as required by law. All questionnaires and data sets will be securely stored in a locked cabinet with access only for the research team and appropriate EAP program employees for research purposes only. Questionnaires and data will be securely stored for a minimum of three years before being destroyed.

IS THIS STUDY VOLUNTARY?

Your participation is voluntary. You may choose not to participate or you may discontinue your participation at any time without penalty or loss of benefits to which you are otherwise entitled. Your decision whether or not to participate will not affect your current or future relations with the University of North Dakota or your EAP program.

CONTACTS AND QUESTIONS?

The researcher conducting this study is Kathy Korell, M.A. You may ask any questions you have now. If you later have questions, concerns, or complaints about the research please contact Kathy Korell at XXX-XXX-XXXX. If you have questions regarding your rights as a research subject, or if you have any concerns or complaints about the research, you may contact the University of North Dakota Institutional Review Board at (701) 777-4279. Please call this number if you cannot reach research staff, or you wish to talk with someone else.

SIGNATURE AND ACKNOWLEDGMENT

My signature below indicates that I have read the above information and have had the opportunity to ask questions about my participation. I understand that the information gathered from these questionnaires will be used for research purposes. I acknowledge having received a copy of this agreement.

Name of child/adolescent participant (printed): _____

Signature of child/adolescent: _____ Date: _____

Name of legal guardian (printed): _____

Signature of legal guardian: _____ Date: _____

Signature of witness: _____ Date: _____

Appendix B
HIPPA Authorization Form

**HIPAA¹ AUTHORIZATION TO USE AND DISCLOSE
INDIVIDUAL HEALTH INFORMATION FOR RESEARCH PURPOSES**

1. Purpose. As a research participant, I authorize Kathy Korell M. A. and the researcher's staff to use and disclose my individual health information for the purpose of conducting the research project entitled "Alleviating equines: Investigating the hypothesized mechanisms of change in equine assisted psychotherapy."

2. Individual Health Information to be Used or Disclosed. My individual health information that may be used or disclosed to conduct this research includes Equine Assisted Psychotherapy (EAP) program information, demographic information and the following self-report questionnaires: Miller-Rada Commitment to Pets Scale (MRCPS), Lexington Attachment to Pets Scale modified for use with EAP (LAPS revised), Index of Empathy for Children and Adolescents (IECA), Adolescent Coping Orientation for Problem Experiences (A-COPE), General Self Efficacy Scale (GSES), Hare Self-Esteem Scale (HSES), Questionnaire about Interpersonal Difficulties for Adolescents (QIDA), Beck Youth Inventories Second Edition – Self-Concept Scale (BYI-SC), and Youth Outcome Questionnaire, parent report (Y-OQ, parent report).

3. Parties Who May Disclose My Individual Health Information. The researcher and the researcher's staff may obtain my individual health information from:

Hospitals: N/A

Clinics: N/A

Other Providers: Equine Assisted Psychotherapy (EAP) program in which you are currently participating

Health Plan: N/A

and from hospitals, clinics, health care providers and health plans that provide my health care during the study.

4. Parties Who May Receive or Use My Individual Health Information. The individual health information disclosed by parties listed in item 3 and information disclosed by me during the course of the research may be received and used by Kathy Korell and the researcher's staff.

5. Right to Refuse to Sign this Authorization. I do not have to sign this Authorization. If I decide not to sign the Authorization, I will not be allowed to participate in this study or receive any research related treatment that is provided through the study. However, my decision not to sign this authorization will not affect any other treatment, payment, or enrollment in health plans or eligibility for benefits.

¹ HIPAA is the Health Insurance Portability and Accountability Act of 1996, a federal law related to privacy of health information

6. Right to Revoke. I can change my mind and withdraw this authorization at any time by sending a written notice to Kathy Korell, XXXXXXXX to inform the researcher of my decision. If I withdraw this authorization, the researcher may only use and disclose the protected health information already collected for this research study. No further health information about me will be collected by or disclosed to the researcher for this study.

7. Potential for Re-disclosure. My individual health information disclosed under this authorization may be subject to re-disclosure outside the research study and no longer protected. For example, researchers in other studies could use my individual health information collected for this study without contacting me if they get approval from an Institutional Review Board (IRB) and agree to keep my information confidential.

7A. Also, there are other laws that may require my individual health information to be disclosed for public purposes. Examples include potential disclosures if required for mandated reporting of abuse or neglect, judicial proceedings, health oversight activities and public health measures.

This authorization does not have an expiration date.

I am the research participant or personal representative authorized to act on behalf of the participant.

I have read this information, and I will receive a copy of this authorization form after it is signed.

signature of research participant

date

printed name of research participant

signature of research participant's legal guardian
or personal representative

date

printed name of research participant's legal guardian
or personal representative

description of personal representative's authority to act on behalf
of the research participant or legal guardian's title

Appendix C
Demographic Questionnaire

Name: _____ Date: _____

Date of Birth: _____ Age: _____

Parent Legal Guardian Name(s): _____

Gender: Male Female

Which would best describe you? (please check all that apply)

African American Asian American
Hispanic American Native American
White (non-Hispanic) Not listed _____ (please write in)

Are you starting or finishing an Equine Assisted Psychotherapy program?

Starting Finishing

Name of program you are starting or finishing (please ask if you do not know):

Number of sessions: _____ Length of time: _____

How often do you meet? Daily Weekly Other: _____

Do you have any pets? (please check all that apply)

Cat - how many _____ Dog - how many _____
Horse - how many _____ Bird - how many _____
Hamster/Gerbil/ Rat - how many _____ Reptile - how many _____
Other: _____ (please list) - how many _____

Have you participated in Equine Assisted Psychotherapy before? Yes No

If yes, what for? _____

What program? _____

How long? _____

Dates? _____

Are you getting psychological treatment somewhere else at the same time? Yes No

If yes, what for? _____

What program? _____

How long? _____

Dates? _____

Please note, we will NOT be contacting any facilities/therapists listed

Address where follow-up questionnaires can be sent:

Street Address or PO Box _____

City _____ State _____ Zip Code _____

Dear [Parent/Legal Guardian's name]:

My name is Kathy Korell, and I am writing in regard to your child, [child's name]. Recently, [child's name] completed an Equine Assisted Psychotherapy program at [EAP program's name], and you both consented to participate in a study examining how Equine Assisted Psychotherapy may help children and adolescents overcome their difficulties. You were informed that you would be given some forms to complete four weeks after your child's treatment ended.

It has now been four weeks since [child's name] left [EAP program's name]. Please complete the Y-OQ, Parent Report Form yourself and have your child complete the other questionnaires. Please return these materials as soon as possible using the postage-paid addressed envelope included with this letter. This part of the study is very important, and I hope you will take the time to complete this. I would like to thank you in advance for your cooperation.

If you have any questions or concerns, please feel free to email me at
XXXXXXXXXX@XXXXX

Thank You,

Kathy Korell, M. A.
Principle Investigator

REFERENCES

- Achenbach, T. M., & Edelbrock, C. (1983). *Child Behavior Checklist and Profile for ages 4-18*. Burlington, VT: University of Vermont.
- Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist and 1991 profile*. Burlington, VT: University of Vermont.
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum
- Allen, K. (1995). Coping with life changes and transitions: The role of pets. *InterActions*, 13(3), 5-10.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders*, (4th ed.). Arlington, VA: Author.
- American Psychological Association. (2002). *Ethical principles of psychologists and code of conduct*. Washington DC: Author.
- American Veterinary Medical Association. (2007). 2007 U.S. pet ownership & demographics sourcebook. Retrieved February 27, 2008 from: <http://www.avma.org/reference/marketstats/ownership.asp>

- Antonioli, C., & Reveley, M. A. (2005). Randomised controlled trial of animal facilitated therapy with dolphins in the treatment of depression. *British Medical Journal*, *331*(7527). Retrieved February 29, 2008 from: <http://www.bmj.com/cgi/reprint/331/7527/1231>
- Banks, M. R., & Banks, W. A. (2005). The effects of group and individual animal-assisted therapy on loneliness in residents of long-term care facilities. *Anthrozoos*, *18*(4), 396-408.
- Barker, S. B., & Dawson, K. S. (1998). The effects of animal-assisted therapy on anxiety ratings of hospitalized psychiatric patients. *Psychiatric Services*, *49*, 797-801.
- Barkley, R. A. (1994). Impaired delayed responding: A unified theory of attention-deficit hyperactivity disorder. In D. K. Routh (Ed.), *Disruptive behavior disorders in childhood*. New York, NY: Plenum. pp. 11-57.
- Baun, M. M., & McCabe, B. W. (2003). Companion animals and persons with dementia of the Alzheimer's type: Therapeutic possibilities. *American Behavioral Scientist*, *47*(1), 42-51.
- Beck, A. M. (2000). The use of animals to benefit humans: Animal-assisted therapy. In Fine, A. (Ed.) *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego, CA: Elsevier Science (USA), pp. 21-40.
- Beck, A. M., & Katcher, A. H. (2003). Future directions in human-animal bond research. *American Behavioral Scientist*, *47*(1), 79-93.
- Beck, A. T., Ward, C. H., Mendelson, M., & Erbaugh, J. (1961). An inventory of measuring depression. *Archive of General Psychology*, *4*, 53-63.

- Beck, J. S., Beck, A. R., & Jolly, J. B. (2005). *Beck youth inventories (2nd ed.)*. San Antonio, TX: Pearson Education, Inc.
- Beiber, N. (1983). The integration of a therapeutic equestrian program in the academic environment of children with physical and multiple disabilities. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 448-459.
- Berger, K. S. (2008). *The developing person through the life span (7th ed.)*. New York: Worth Publishers.
- Biery, M. J. (1985). Riding and the handicapped. *Veterinary Clinics of North America: Small Animal Practice*, 15, 345-354.
- Bizub, A. L., Joy, A., & Davidson, L. (2003). "It's like being in another world": Demonstrating the benefits of therapeutic horseback riding for individuals with psychiatric disability. *Psychiatric Rehabilitation Journal*, 26(4), 377-384.
- Bowlby, J. (1969). *Attachment and loss: Vol. I. Attachment*. New York: Basic Books.
- Brock, B. (1997). Therapy on horseback: Psychomotor and psychological changes in physically disabled adults. In B. T. Engel (Ed.), *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services. pp. 107-116.
- Brown, L. & Alexander, J. (1991). *Self Esteem Index Examiner's Manual*. Austin, TX: Pro-ed.
- Bryant, B. K. (1982). An index of empathy for children and adolescents. *Child Development*, 53, 413-425.

- Bureau of Land Management [BLM]. (2008). Adoptions at facilities. Retrieved April 5, 2008 from: http://www.blm.gov/wo/st/en/prog/wild_horse_and_burro/adoptions_of_wild_horses/facility__adoptions.html
- Burgon, H. (2003). Case studies of adults receiving horse-riding therapy. *Antozoos*, 16(3), 263-275.
- Burlingame, G. M., Mosier, J. L., Wells, M. G., Atkin, Q. G., Lambert, M. J., Whoolery, M., & Latkowski, M. (2001). Tracking the influence of mental health treatment: The development of the Youth Outcome Questionnaire. *Clinical Psychology and Psychotherapy*, 8, 361-379.
- Burlingame, G. M., Wells, G., & Lambert, M. J. (1996). *Youth Outcome Questionnaire (Y-OQ 2.01)*. Orem, UT: American Professional Credentialing Services LLC.
- Buss, A. H. & Perry, M. (1992). The aggression questionnaire. *Journal of Personality and Social Psychology*, 63, 452-459.
- Cain, A. O. (1983). A study of pets in the family system. In A. H. Katcher & A. M. Beck (Eds.). *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 72-81.
- Cantazaro, T. E. (2003a). Human-animal bond in primary prevention. *American Behavioral Scientist*, 47(1), 29-30.
- Cantazaro, T. E. (2003b). Human-animal bond and secondary prevention. *American Behavioral Scientist*, 47(1), 40-41.
- Cantazaro, T. E. (2003c). Human-animal bond and tertiary prevention. *American Behavioral Scientist*, 47(1), 52-54.

- Cawley, R., Cawley, D., & Kristen Retter. (1988). Therapeutic horseback riding and self-concept in adolescents with special educational needs. *Anthrozoos*, 7(2), 129-133.
- Chandler, C. K. (2005). *Animal assisted therapy in counseling*. New York, NY: Routledge.
- Christian, J. E. (2005). All creatures great and small: Utilizing equine-assisted therapy to treat eating disorders. *Journal of Psychology and Christianity*, 24(1), 65-67.
- Cohen, J. A., Deblinger, E., & Mannarino, A. P. (2005). Trauma-focused cognitive-behavioral therapy for sexually abused children. In E. D. Hibbs & P. S. Jensen (Eds.). *Psychosocial treatments for child and adolescent disorders: Empirically based strategies for clinical practice*, (2nd ed.), pp. 743-765.
- Cohen, J. A., Mannarino, A. P., & Deblinger, E. (2003). *Child and parent trauma-focused cognitive behavioral therapy treatment manual*. Pittsburgh, PA: Allegheny General Hospital and University of Medicine and Dentistry of New Jersey.
- Cohen, J. A., Mannarino, A. P., & Deblinger, E. (2006). *Treating trauma and traumatic grief in children and adolescents*. New York: Guilford Press.
- Cohen, J. A., Mannarino, A. P., Perel, J. M., Staron, V. (2007). A pilot randomized controlled trial of combined trauma-focused CBT and setraline for childhood PTSD symptoms. *Journal of the American Academy of Child & Adolescent Psychiatry*, 46(7), 811-819.
- Colombo, G., Dello Buono, M., Smania, K., Raviola, R., & De Leo, D. (2006). Pet therapy and institutionalized elderly: A study on 144 cognitive unimpaired subjects. *Archives of Gerontology and Geriatrics*, 42, 207-216.

- Condoret, A. (1983). Speech and companion animals: Experience with normal and disturbed nursery school children. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 467-471.
- Conners, C. K. (1990). *Conner's Rating Scales manual*. North Towanda, NY: Multi-Health Systems.
- Cook, R. (1997). Remedial riding therapy: A study of traumatic brain injured adults. In B. T. Engel (Ed.), *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services. pp. 249-272.
- Correctional Service of Canada [CSC]. (1998). Pet facilitated therapy in correctional institutions. Retrieved April 5, 2008 from: http://www.csc-scc.gc.ca/text/prgrm/fsw/pet/pft_e.tf
- Crawford, Jackie, Skolnik, & Howard. (2002). The benefits of community involvement with correctional industries in Nevada. *Corrections Today*. Retrieved April 5, 2008 from: <http://www.allbusiness.com/public-administration/justice-public-order/999939-1.html>
- Cushing, J. L., Williams, J. D., & Kronick, R. F. (1995). The wild mustang program: A case study in facilitated inmate therapy. *Journal of Offender Rehabilitation*, 22, 95-112.
- Dakota Boys and Girls Ranch. (2008). *Annual Clinical Plan 2007-2008*. Unpublished document.
- Delta Society. (1992). Does pet ownership reduce your risk for heart disease? *InterActions*, 10(3), 12-13.

- Derogatis, L. R. (1993). *Brief symptom inventory (BSI): Administration, scoring, and procedures manual*. Minneapolis: NCS Person, Inc.
- DeRosa, R., Pelcovitz, D., Rathus, J., Ford, J., Habib, M., Sonnenklar, J., et al. (2005). *Structured psychotherapy for adolescents responding to chronic stress (SPARCS): A trauma-focused guide*. Manhasset, NY: North Shore University Hospital.
- DeRosa, R., Habib, M., Pelcovitz, D., Rathus, J., Sonnenklar, J., Ford, J., Sunday, S., Layne, D., Saltzman, W., Turnbull, A., Labruna, V., & Kaplan, S. (2006). *Adolescents responding to chronic stress*. Unpublished manual.
- Diamond, J. (1992). *The third chimpanzee*. New York, NY: HarperCollins.
- Dorrance, T. (1987). M. H. Porter (Ed.). *True unity: willing communication between horse and human*. Bruncau, ID: Give-It-A-Go-Enterprises.
- Duncan, S. L., & Allen, K. (2000). Service animals and their roles in enhancing independence, quality of life, and employment for people with disabilities. In Fine, A (Ed.) *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego, CA: Elsevier Science (USA), pp. 303-323.
- Eddy, T. J. (1995). Human cardiac responses to familiar young chimpanzees. *Antozoos*, 8, 235-243.
- Eddy, T. J. (1996). RM and Beaux: Reductions in cardiac activity in response to a pet snake. *The Journal of Nervous and Mental Disease*, 184(9), 573-575.
- Endersby, H. (2007). Project Noble Mustang. *Western Horseman*, Dec., 76-80.
- Ewing, C. A., MacDonald, P. M., Taylor, M., & Bowers, M. J. (2007). Equine-facilitated learning for youths with severe emotional disorders: A quantitative and qualitative study. *Child Youth Care Forum*, 36, 59-72.

- Feigenbaum, J. (2007). Dialectical behavior therapy: An increasing evidence base. *Journal of Mental Health, 16*(1), 51-68.
- Fine, A. F. (2000a). *Foreward*. In Fine, A. (Ed.) *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego, CA: Elsevier Science (USA), pp. xxxvii-xliv.
- Fine, A. F. (2000b). Animals and therapists. In Fine, A. (Ed.) *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego, CA: Elsevier Science (USA), pp. 179-211.
- Fisher, J. E., Zeiss, A. M., & Carstensen, L. L. (2001). Psychopathology in the aged. In H. E. Adams & P. B. Sutker (Eds.). *Comprehensive handbook of psychopathology* (3rd ed.). New York: Kluwer Academic/Plenum Publishers, pp. 921-951.
- Fleck, C. A. (1997). Hippotherapy: Mechanics of human walking and horseback riding. In B. T. Engel (Ed.). *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services, pp. 153-176.
- Ford, J., Mahoney, K., & Russo, E. (2004). *Trauma adaptive recovery – group education and therapy (TARGET)*. Farmington, CT: University of Connecticut Health Center.
- Fournier, A. K., Geller, E. S., & Fortney, E. V. (2007). Human-animal interaction in a prison setting: Impact on criminal behavior, treatment progress, and social skills. *Behavior and Social Issues, 16*, 89-105.

- Fox, J., & Peterson, B. (1997). Enduring effect of hippotherapy on passive hip abduction in children with spastic cerebral palsy. In B. T. Engel (Ed.), *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services. pp. 277-296.
- Friedman, E. (2000). The animal-human bond: health and wellness. In Fine, A. (Ed.) *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego, CA: Elsevier Science (USA), pp. 41-58.
- Friedman, E., Katcher, A. H., & Meislich, D. (1983). When pet owners are hospitalized: Significance of companion animals during hospitalization. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 346-350.
- Fuller, J. L. (1967). Experiential deprivation and later behavior. *Science*, 158, 1645-1652.
- Furst, G. (2006). Prison-based animal programs. *The Prison Journal*, 86(4), 407-430.
- Gagriela, L. (1997). Indication of remedial vaulting for anorexia nervosa. In B. T. Engel (Ed.), *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services. pp. 35-54.
- Gammonley, J., Howie, A. R., Kirwin, S., Zapf, S. A., Frye, J., Freemar, G., & Stuart-Russell, R. (1996). *Animal-assisted therapy: Therapeutic interventions*. Renton, WA: Delta Society.

- Gorezyea, K., Fine, A. H., & Spain, C. V. (2000). History, theory, and development of human-animal support services for people with AIDS and other chronic/terminal illnesses. In Fine, A. (Ed.) *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego, CA: Elsevier Science (USA), pp. 253-302.
- Granger, B. P., & Kogan, L. (2000). Animal-assisted therapy in specialized settings. In Fine, A. (Ed.) *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego, CA: Elsevier Science (USA), pp. 213-236.
- Haartz, E. (1997). Vigorous head nodding by a rider during the sitting trot. In B. T. Engel (Ed.), *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services, pp. 65-74.
- Hall, C. A. (2007). The impact of visual perception on equine learning. *Behavioural Processes*, 76, 29-33.
- Hamilton, M. (1976). Development of a rating scale for primary depressive illness. *British Journal of Social and Clinical Psychology*, 6, 278-296.
- Hanggi, E. B. (1999). Categorization learning in horses (*Equus caballus*). *Journal of Comparative Psychology*, 113(?), 243-252.
- Hanggi, E. B. (2003). Discrimination learning based on relative size concepts in horses (*Equus caballus*). *Applied Animal Behaviour Science*, 83, 201-213.
- Hansen, K. (1997). A group case study: Hippotherapy as a means of improving gross motor function in children with cerebral palsy. In B. T. Engel (Ed.), *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services, pp. 233-240.

- Hansen, K. M., Messinger, C. J., Baun, M. M., & Megel, M. (1999). Companion animals alleviating distress in children. *Anthrozoos, 12*(3), 142- 148.
- Hare, B. R. (1985). The HARE general and area-specific (school, peer, and home) self-esteem scale. Unpublished manuscript, Department of Sociology, SUNY Stony Brook, Stony Brook, New York (mimeo.). Instrument reproduced with permission of Bruce R. Hare.
- Harlow, H. F., & Harlow, M. K. (1962). Social deprivation in monkeys. *Scientific American, 207*, 136-144.
- Harris, J. (1983). A study of client grief responses to death or loss in a companion animal veterinary practice. In A. H. Katcher & A. M. Beck (Eds.). *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press, pp. 370-376.
- Hart, L. A. (2000). Psychosocial benefits of animal companionship. In Fine, A. (Ed.) *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego, CA: Elsevier Science (USA), pp. 59-78.
- Harter, S. (1998). *The self-perception profile for adolescents*. Unpublished manual. University of Denver.
- Hausberger, M., Bruderer, C., Le Scolan, N., & Pierre, J. (2004). Interplay between environmental and genetic factors in temperament/personality traits in horses (*Equus caballus*). *Journal of Comparative Psychology, 118*(4), 434-446.

- Heindel, W. C., & Salmon, D. P. (2001). Cognitive approaches to the memory disorders of demented patients. In H. E. Adams & P. B. Sutker (Eds.), *Comprehensive handbook of psychopathology* (3rd ed.). New York: Kluwer Academic/Plenum Publishers. pp. 841-878.
- Hines, L. M. (2003). Historical perspectives on the human-animal bond. *American Behavioral Scientist*, 47(1), 7-15.
- Hoff, J. (1997). Analysis of manual gripping during therapeutic riding in a rehabilitation project. In B. T. Engel (Ed.), *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services. pp. 75-98.
- Holcomb, R., & Meacham, M. (1989). Effectiveness of an animal-assisted therapy program in an inpatient psychiatric unit. *Anthrozoos*, 2(4), 259-264.
- Howell, D. C. (2002). *Statistical methods for psychology* (5th ed.). Pacific Grove, CA: Thompson Learning.
- Huss, D. B., & Baer, R. A. (2007). Acceptance and Change: The Integration of Mindfulness-Based Cognitive Therapy Into Ongoing Dialectical Behavior Therapy in a Case of Borderline Personality Disorder With Depression. *Clinical Case Studies*, 6(1), 17-33.
- Irwin, C., & Weber, B. (2001). *Horses don't lie*. New York, NY: Marlow & Company.
- Inglés, C.J. Méndez, F.X., & Hidalgo, M.D. (2000). Cuestionario de Evaluación de Dificultades Interpersonales en la Adolescencia [Questionnaire about Interpersonal Difficulties for Adolescents]. *Psicothema*, 12, 390-398.

- Johnson, R. A., Meadows, R. L., Haubner, J. S., & Sevedge, K. (2003). Human-animal interaction: A complimentary/alternative medical (CAM) intervention for cancer patients. *American Behavioral Scientist*, 47(1), 55-69.
- Johnson, T. P., Garrity, T. F., & Stallones, L. (1992). Psychometric evaluation of the Lexington attachment to pets scale (LAPS). *Anthrozoos*, 5(3), 160-175.
- Jones, B. (1983). Just crazy about horses: The fact behind the fiction. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 87-111.
- Karatzias, A., Chouliara, Z., Powell, K., & Swanson, V. (2006). Predicting general well-being from self-esteem and affectivity: An exploratory study with Scottish adolescents. *Quality of Life Research*, 15, 1143-1151.
- Karsh, E. B. (1983). The effects of early handling on the development of social bonds between cats and people. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 22-28.
- Katcher, A. H. (2000). The future of education and research on the animal-human bond and animal-assisted therapy. Part B: Animal-assisted therapy and the study of human-animal relationships: Discipline or bondage? Context or transitional object? In Fine, A. (Ed.) *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego, CA: Elsevier Science (USA), pp. 461-473.

- Katcher, A. H., Friedmann, E., Beck, A. M., & Lynch, J. (1983). Looking, talking, and blood pressure: The physiological consequences of interaction with the living environment. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 351-359.
- Katcher, A. H., & Wilkins, G. G. (2000). Centaur's lessons: Therapeutic education through care of animals and nature. In Fine, A. (Ed.) *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego, CA: Elsevier Science (USA), pp. 153-177.
- Kirby, J. S., & Baucom, D. H. (2007). Treating emotion dysregulation in a couples context: A pilot study of a couples skills group intervention. *Journal of Marital & Family Therapy*, 33(3), 375-391.
- Kohanov, L. (2001). *The tao of equus: A woman's journey of healing and transformation through the way of the horse*. Novato, CA: New World Library.
- Kovaacs, Z., Bulucz, J., Kis, R., & Simon, L. (2006). An exploratory study of the effect of animal-assisted therapy on nonverbal communication in three schizophrenic patients. *Anthrozoos*, 19(4), 353-364.
- LaFrance, C., Garcia, L. J., & Labreche, J. (2007). The effect of a therapy dog on the communication skills of an adult with aphasia. *Journal of Communication Disorders*, 40, 215-224.

- Lago, D. J., Knight, B., & Connell, C. (1983). Relationships with companion animals among the rural elderly. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 328-340.
- Lambert, M. J., Huefner, J. C., & Resinger, C. W. (1996). Quality improvement: Current research in outcome management. In W. T. Stricker & S. Sheurman (Eds.), *Handbook of quality management in behavioral health*. New York, NY: Plenum.
- Laughlin, M. (2008). Wyoming Honor Farm inmate/wild-horse program. Retrieved April 5, 2008 from: <http://www.cowboysthrowcase.com/honorfarm.htm>
- Layne, C. M., Pynoos, R. S., Saltzman, W. R., Arslanagic, B., Black, M., Savjak, N., et al. (2001). Trauma/grief-focused group psychotherapy: School-based postwar intervention with traumatized Bosnia adolescents. *Group Dynamics*, 5(4), 277-290.
- Linchan, M. (1993). *Cognitive behavioral treatment of Borderline Personality Disorder*. New York: Guildford Press.
- Linchan, M., Armstrong, H. E., Suarez, A., Allmon, D., & Heard, H. L. (1991). Cognitive-behavioral treatment of chronically parasuicidal borderline patients. *Archives of General Psychology*, 48, 1060-1064.
- Linchan, M., Heard, H. L., & Armstrong, H. E. (1993). Naturalistic follow-up of a behavioral treatment for chronically parasuicidal borderline patients. *Archives of General Psychology*, 50, 971-974.

- Lockwood, R. (1983). The influence of animals on social perception. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 64-71.
- Lynch, T. R., & Cheavens, J. S. (2008). Dialectical behavior therapy for comorbid personality disorders. *Journal of Clinical Psychology*, 64(2), 154-167.
- Lynch, T. P., Cheavens, J. S., & Cukrowicz. (2007). Treatment of older adults with comorbid personality disorder and depression: A dialectical behavior therapy approach. *International Journal of Geriatric Psychiatry*, 22(2), 131-143.
- Malecky, C. K., & Demaray, M. K. (2002). Measuring perceived social support: Development of the child and adolescent social support scale (CASSS). *Psychology in the Schools*, 39(1), 1-18.
- Mallon, G. P. (1992). Utilization of animals as therapeutic adjuncts with children and youth: a review of the literature. *Child and Youth Care Forum*, 21(1), 53-67.
- Manning, A. (1983). Ethological approaches to the human-companion animal bond. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 7-16.
- Marx, R. D., & Cumella, E. J. (2003). Question: Is equine therapy useful in the treatment of eating disorders? *Eating Disorders*, 11, 143-147.
- Mason, W. A. (1983). Dogs as monkey companions. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 17-21.

- Matteson, M. T. (1974). Type of transmittal letter and questionnaire color as two variables influencing response rates in a mail survey. *Journal of Applied Psychology*, 59(4), 535-536.
- McCann, R. A., Ball, E. M., & Ivanhoff, A. (2000). DBT with an inpatient forensic population: The CMHIP forensic model. *Cognitive and Behavioral Practice*, 7(4), 447-456.
- McCormick, A. V., & McCormick, M. D. (1997). *Horse sense and the human heart: What horses can teach us about trust, bonding, creativity, and spirituality*. Deerfield Beach, FL: Health Communications, Inc.
- McCubbin, H. I., & Thompson, A. I. (Eds.). (1991). *Family assessment inventories for research and practice*. Madison, WI: University of Wisconsin.
- McCulloch, M. J. (1983). Animal-assisted therapy: Overview and future direction. In A. H. Katcher & A. M. Beck (Eds.). *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 410-426.
- McDonald, P. M. (2004). The effectiveness of equine-facilitated therapy with at-risk adolescents: A summary of empirical research across multiple centers and programs. In The Center for the Interaction of Animals and Society (CIAS) (Ed.). *Can animals help humans heal? Animal-assisted interventions in adolescent mental health*. Retrieved April 5, 2008 from:
www2.vet.upenn.edu/research/centers/cias/pdf/Proceedings.pdf
- Melson, G. F. (2003). Child development and the human-companion animal bond. *American Behavioral Scientist*, 47(1), 31-39.

- Messent, P. R. (1983). Social facilitation of contact with other people by pet dogs. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 37-46.
- Miller, A. L., Rathus, J. H., & Linehan, M. M. (2006). *Dialectical Behavior Therapy with Suicidal Adolescents*. NY: Guilford Publications.
- Myers, G. (1998). *Children and animals: Social development and our connections to other species*. Boulder, CO: Westview Press.
- Myers, J. L., & Well, A. D. (2003). *Research design and statistical analysis* (2nd ed.). Mahawah, NJ: Lawrence Erlbaum Associates.
- National Child Traumatic Stress Network [NCTSN]. (2005). *Structured psychotherapy for adolescents responding to chronic stress (SPARCS) manual*. Great Neck, NY: North Shore-Long Island Jewish Health System, Inc.
- National Child Traumatic Stress Network [NCTSN]. (ND). NCTSN Knowledge Bank. Retrieved April 21, 2008 from: <http://kb.nctsn.org/SPT--BrowseResources.php?ParentId=292>
- Nee, C., & Farman, S. (2007). Dialectical behaviour therapy as a treatment for borderline personality disorder in prisons: Three illustrative case studies. *Journal of Forensic Psychiatry & Psychology*, 18(2), 160-180.
- Nelson-Gray, R. O., Keane, S. P., Hurst, R. M., Mitchell, J. T., Warburton, J. B., Chok, J. T., & Cobb, A. R. (2006). A modified DBT skills training program for oppositional defiant adolescents: Promising preliminary findings. *Behaviour Research and Therapy*, 44(12), 1811-1820.

- Nilson, R. (2004). Equine-facilitated psychotherapy. *Perspectives in psychiatric care*, 40(2), 42.
- Norwicki, S., Jr., & Strickland, B. R., (1973). A locus of control scale for children. *Journal of Consulting and Clinical Psychology*, 40, 148-154.
- O'Connor, C. (2006). *The silent therapist: A review of the development of equine assisted psychotherapy*. Retrieved February 24, 2008 from <http://www.catra.net/info/silent.html>
- Pearson, E. T. (1997). Effects of equine facilitated therapy on the antisocial behavior of adolescent males. In B. T. Engel (Ed.), *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services, pp. 177-206.
- Pichot, T., & Coulter, M. (2007). *Animal-assisted brief therapy: A solution-focused approach*. Binghamton, NY: The Haworth Press, Inc.
- Poresky, R. H., Hendrix, C., Mosier, J. E., & Samuelson, M. L. (1988). Children's pets and adults' self-concepts. *The Journal of Psychology*, 122(5), 463-469.
- Prochaska, J. O., & Norcross, J. C. (2007a). Person-centered therapy. In *Systems of psychotherapy: A transtheoretical analysis*. (6th ed.). Belmont, CA: Thompson Brooks/Cole, pp. 135-166.
- Prochaska, J. O., & Norcross, J. C. (2007b). Psychoanalytic therapies. In *Systems of psychotherapy: A transtheoretical analysis*. (6th ed.). Belmont, CA: Thompson Brooks/Cole, pp. 61-97.
- Prothmann, A., Albrecht, K., Dietrich, S., Hornfeck, U., Stieber, S., & Etrich, C. (2005). Analysis of child-dog play behavior in child psychology. *Antrozoos*, 18(1), 43-58.

- Prothmann, A., Bienert, M., & Etrich, C. (2006). Dogs in child psychotherapy: Effects on state of mind. *Antzoos*, *19*(3), 265-277.
- Quackenbush, J., & Glickman, L. (1983). Social work services for bereaved pet owners: A retrospective case study in a veterinary teaching hospital. In A. H. Katcher & A. M. Beck (Eds.). *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 377-389.
- Riggio, R. E. (1986). Assessment of basic social skills. *Journal of Personality and Social Psychology*, *51*, 649-660.
- Reed, C. A. (1959). Animal domestication in the prehistoric near east: The origins and history of domestication are beginning to emerge from archeological excavations. *Science*, *130*, 1629-1639.
- Robin, M., ten Bensele, R., Quigley, J. S., & Anderson, R. K. (1983). Childhood pets and the psychosocial development of adolescents. In A. H. Katcher & A. M. Beck (Eds.). *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 436-443.
- Roemer, L., Salters-Pedneault, K., & Orsillo, S. M. (2006). Incorporating Mindfulness- and Acceptance-Based Strategies in the Treatment of Generalized Anxiety Disorder. In R. A. Baer (Ed.). *Mindfulness-based treatment approaches: Clinician's guide to evidence base and applications*. San Diego, CA: Elsevier Academic Press, pp. 51-74.
- Rogers, C. R. (1957). The necessary and sufficient conditions of therapeutic personality change. *Journal of Consulting Psychology*, *21*, 95-103.

- Rosenthal, D. A., Gurney, R. M., & Moore, S. M. (1991). From trust to intimacy: A new inventory for examining Erikson's stages of psychosocial development. *Journal of Youth and Adolescence*, 10(6), 525-537.
- Russell, D. W. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*, 66, 20-40.
- Russell-Martin, L. A. (2006). *Equine facilitated couples therapy and solution focused couples therapy: A comparison study*. Unpublished doctoral dissertation. Northcentral University, Prescott, AZ.
- Sanislow, C. A., & Carson, R. C. (2001). Schizophrenia: A critical examination. In H. E. Adams & P. B. Sutker (Eds.), *Comprehensive handbook of psychopathology* (3rd ed.). New York: Kluwer Academic/Plenum Publishers, pp. 403-441.
- Savishinsky, J. J. (1983). Pet ideas: The domestication of animals, human behavior, and human emotions. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 112-131.
- Schultz, B. N. (2005). *The effects of equine-assisted psychotherapy on the psychosocial functioning of at-risk adolescents ages 12-18*. Unpublished Master's Thesis, Denver Seminary, Denver, CO. Retrieved March 2, 2008 from: <http://www.eagala.org/Research/Academic%20Papers.htm>
- Schultz, P. N., Remick-Barlow, G. A., & Robbins, L. (2007). Equine-assisted psychotherapy: A mental health promotion/intervention for children who have experienced intra-family violence. *Health and Social Care in the Community*, 15(3), 265-271.

- Sellers, D. M. (2005). The evaluation of an animal assisted therapy intervention for elders with dementia in long-term care. *Activities, Adaptation, & Aging, 30*(1), 61-77.
- Shostrom, E. L. (1974). *Personal orientation inventory manual: An inventory for the measurement of self-actualization*. San Diego: Education and Industrial Testing Service.
- Selvinen, S. P. (1997). The effect of riding therapy on the walk and leg movements of patients with multiple sclerosis. In B. T. Engel (Ed.). *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services. pp. 3-14.
- Serpell, J. A. (2000). Animal companions and human well-being: An historical exploration of the value of human-animal relationships. In Fine, A. (Ed.) *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego, CA: Elsevier Science (USA), pp. 3-17.
- Smith, B. A. (1983). Project inreach: A program to explore the ability of Atlantic bottlenose dolphins to elicit communication responses from autistic children. In A. H. Katcher & A. M. Beck (Eds.). *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 460-466.
- Smith, P., Yule, W., Perrin, S., Tranah, T., Dalgleish, T., & Clark, D. M. (2007). Cognitive-behavioral therapy for PTSD in children and adolescents: A preliminary randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry, 46*(8), 1051-1061.

- Smith, S. L. (1983). Interactions between pet dog and family members: An ethological study. In A. H. Katcher & A. M. Beck (Eds.). *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 29-36.
- Souter, M. A. & Miller, M. D. (2007). Do animal-assisted activities effectively treat depression? A meta-analysis. *Anthrozoos*, 20(2), 167-180.
- Spanier, G. B. (1967). Measuring didactic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family*, 38, 15-28.
- Spielberger, C. D. (1977). *State-Trait Anxiety Inventory Manual*. Palo Alto, CA: Mind Garden.
- Staats, S., Miller, D., Carnot, M. J., Rada, K., & Turnes, J. (1996). The Miller-Rada commitment to pets scale. *Anthrozoos*, 9(2/3), 88-94.
- Stein, K. B., Soskin, W. F., & Korchin, S. J. (1974). Interpersonal trust and disaffected high school youth. *Journal of Youth and Adolescence*, 3(4), 281-292.
- Stewart, M. (1983). Loss of a pet-loss of a person: A comparative study of bereavement. In A. H. Katcher & A. M. Beck (Eds.). *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 390-404.
- Strimple, E. O. (2003). A history of prison inmate-animal interaction programs. *American Behavioral Scientist*, 47(1), 70-78.

- Schwarzer, R. & Jerusalem, M. (1995). Generalized Self-Efficacy Scale. In J. Weinman, S. Wright, & M. Johnston (Eds.), *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35-37). Windsor, England: NFER-NELSON.
- Sykes, M., Gouge, D., Newstead, A., Freeman, G., Tomberlin, J. A., & Mossberg, K. (1997). The effects of therapeutic horseback riding on balance in persons with brain injury. In B. T. Engel (Ed.), *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services. pp. 127-144.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Boston, MA: Pearson Education, Inc.
- Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063-1070.
- Tetreault, A. (2006). *Horses that heal: The effectiveness of equine assisted growth and learning on the behavior of students diagnosed with emotional disorder*. Unpublished master's thesis, Governors State University, University Park, IL. Retrieved March 2, 2008 from: <http://www.eagala.org/Research/Academic%20Papers.htm>.
- Thompson, M., Kennedy, R. W., & Igoia, S. (1983). Pets and socializing agents with chronic psychiatric patients: An initial study. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 427-430.

- Tolson, P. (1997). Therapeutic horseback riding and behavior change in children with autism: A single subject study. In B. T. Engel (Ed.). *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services. pp. 15-34.
- Trotter, K. S. (2006). *The efficacy of equine assisted group counseling with at-risk children and adolescents*. Unpublished doctoral dissertation, University of North Texas, Denton, TX. Retrieved March 2, 2008 from:
<http://www.eagala.org/Research/Academic%20Papers.htm>
- Tucker, S. F. (1997). Effects of equine facilitated therapy on self-concept, locus of control, impulsivity, and hopelessness in adolescent males. In B. T. Engel (Ed.). *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services. pp. 207-220.
- Van de Castle, R. L. (1983). Animal figures in fantasy and dreams. In A. H. Katcher & A. M. Beck (Eds.). *New perspectives on our lives with companion animals*. Philadelphia, PA: University of Pennsylvania Press. pp. 148-173.
- Wagner, A. W., & Linehan, M. M. (2006). Applications of Dialectical Behavior Therapy to Posttraumatic Stress Disorder and Related Problems. In V. M. Follette & J. I. Ruzek (Eds.). *Cognitive-behavioral therapies for trauma* (2nd ed.). New York, NY, US: Guilford Press, pp. 117-145.
- Wasserman, R., & Keeney, A. M. (1997). Hippotherapy for the child with cerebral palsy. In B. T. Engel (Ed.). *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services. pp. 241-248.

- Wells, M. G., Burlingame, G. M., Lambert, M. J., Hoag, M. J., & Hope, C. A. (1996). Conceptualization and measurement of patient change during psychotherapy: Development of the outcome questionnaire and youth outcome questionnaire. *Psychotherapy: Theory, Research, and Practice, 33*, 275-283.
- Wells, M. G., Burlingame, G. M., Rose, P. M., & Reisinger, C. W. (1999). *Administration and scoring manual for the Y-OQ-SR 2.0: Youth outcome questionnaire-self report*. Orem, UT: American Professional Credentialing Services, LLC.
- Werkerson, B. S., & Stewart, C. (1997). The integration of hippotherapy, cransiosacral therapy and myofasial release techniques for the treatment of chronic pain case report. In B. T. Engel (Ed.). *Rehabilitation with the aid of a horse: A collection of studies*. Durango, CO: Barbara Engel Therapy Services. pp. 55-64.
- Williamson, D. A., Zucker, N. L., Martin, C. K., & Smeets, M. A. M. (2001). Etiology and management of eating disorders. In H. E. Adams & P. B. Sutker (Eds.). *Comprehensive handbook of psychopathology*, (3rd ed.). New York: Kluwer Academic/Plenum Publishers.